A Far-Reaching Parental Love? Co-Governance of Intergenerational Succession and Innovation Activities in Chinese Family Firms

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ABSTRACT Motivated by the research gap on intergenerational succession dynamics of family firms, this study examines the effects of initiating intergenerational succession on firms' innovation activities. We propose that initiation of intra-family succession can result in founder–successor co-governance that represents a strategic transition to the succession and incorporates the two conflicting yet complementary directions of change and continuity. Grounded in the theory of altruism, we suggest that co-governance will positively affect firms' innovation activities and that this positive link is contingent on the idiosyncratic intra-family relationships of kinship type, age difference, and gender difference between the founder and the successor. Furthermore, we posit that co-governance will lead to a flow of resources to low risk, rather than more inventive but higher risk, innovations. Based on the unbalanced panel data of 4,694 firm-year observations in our sample from listed Chinese family firms during the 2006–2015 period, empirical analysis supports our hypotheses and confirms that when examining family firms' innovation, there is a need to take the heterogeneity of the intra-family governance structure more fully into consideration.

KEYWORDS altruism, co-governance, innovation, intergenerational succession

INTRODUCTION

Intergenerational succession has long been a significant topic in family firm research (Dyer & Sánchez, 1998; Garcia, Sharma, De Massis, Wright, & Scholes, 2019; Gilding, Gregory, & Cosson, 2015; Le Breton-Miller, Miller, & Steier, 2004; Shi, Graves, & Barbera, 2019), as a smooth succession plays a crucial role in the sustainable growth of family firms. The succession issue is especially important for family firms in China, because first-generation entrepreneurs as the family firm founders and owners, who emerged in the process of China's opening up and economic reform, are increasingly reaching an advanced age

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and the family firms they created are facing an urgent need for intergenerational succession. Moreover, intergenerational succession is even more difficult for first-generation family firms, as these firms have a strong dependence on the founders in terms of governance capability, business network relationships, and entrepreneurial spirit, for their sustainable growth and development.

Prior research on intergenerational succession mainly focuses on the choice of succession model between intra-family succession and introduction of external professional executives, as well as on the motivating factors and outcomes of such choices (Gilding et al., 2015; Lambrecht, 2005; Michel & Kammerlander, 2015; Schulze, Lubatkin, & Dino, 2003a). Although important insights have been derived from existing research to explain succession in family firms, significant gaps still remain. First, existing research on Chinese family firm succession tends to take some individual events, such as the successor's entry to the top management team (TMT) or taking over the top position of the firm, as signifying succession, thus resulting in neglect of important succession dynamics in the transitional period when the founder and successor jointly take charge of the firm (Zhao, Carney, Zhang, & Zhu, 2020). However, as a continuous process, intergenerational succession runs through the whole transitional period, through which governance and managerial power incrementally shift to the successor (Hauck & Prügl, 2015). Treating intergenerational succession as a single event would conceal the dynamic features of strategic changes such as innovation activities during the succession process. While intra-family succession represents a mainstream mode, inclusion of both the founder and successor in the TMT is a common phenomenon in intergenerational succession as a transitional governance structure (Dou & Li, 2013; Zhao et al., 2020). Building on these prior studies, we conceptualize the inclusion of both the incumbent and successor in the TMT as the co-governance of the family firm and define it as a governance structure in which both the founder and successor generations of the owning family take key positions in the governing body and/or TMT, signifying the transitional process for intergenerational succession.

Second, results from prior studies examining the relationship between intergenerational succession and innovation have been inconclusive and inconsistent (De Massis, Di Minin, & Frattini, 2015; Richards, Kammerlander, & Zellweger, 2019). On the one hand, intergenerational succession represents a long-term orientation of family firms, which fosters innovation because innovation is associated with long-term growth and survival (Chrisman & Patel, 2012; Kraiczy, Hack, & Kellermanns, 2015; Laforet, 2013). On the other hand, the risk aversion tendency due to the desire to preserve the family legacy and tradition during intergenerational succession deters family firms from innovation given the involved risk (Block, 2012; Gomez-Mejia, Neacsu, & Martin, 2019; Miller & Le Breton-Miller, 2014). The inconsistent views demonstrate the heterogeneous nature of family firm innovation and indicate that there is a hidden link between intergenerational succession and innovation of family firms, resulting in a call for research to

identify the drivers and mechanisms for heterogeneity (Chrisman & Patel, 2012; Diaz-Moriana, Clinton, Kammerlander, Lumpkin, & Craig, 2020).

Responding to this call, our study aims to address existing research gaps by examining the research question of how intergenerational co-governance during the succession process influences firms' innovation activities. Intergenerational succession is structured as a staged process (Le Breton-Miller et al., 2004; Zhao et al., 2020) in which a potential successor is groomed and gradually integrated into top management until attaining a full leadership role. The governance team of family firms in China is characterized as an inner circle that includes spouses, siblings, children, and trusted nonfamily members (Chung & Luo, 2008). The succession process starts when a next-generational family member, typically the only child in contemporary China, takes one of the key positions in the firm (Cao, Cumming, & Wang, 2015). Based on progress made in the succession process, co-governance includes two stages, with the older generation taking the leading role in the first stage and the successor generation taking the leading role in the second stage, respectively. This study focuses on co-governance as a whole process by including both stages.

The Chinese saying that 'the true love of parents would be far-reaching' describes the unselfish love for their children and suggests that parental care will be far-sighted. Reflecting this parental altruistic behavior, intergenerational succession of the family firm can provide the impetus for significant strategic changes (Zhao et al., 2020) to pave the way for succession with a long-term orientation. As one of the major strategic changes, co-governance may emerge as the transitional governance structure during the succession process and, in turn, co-governance is likely to lead to major changes in the firm's business strategies, especially in innovation. This is because innovation represents an investment in future growth (Coad & Rao, 2011; Diaz-Moriana et al., 2020; Duran, Kammerlander, Van Essen, & Zellweger, 2016) by establishing sustainable competitive advantage of the firm (Gomez-Mejia, Campbell, Martin, Hoskisson, Makri, & Sirmon 2014; Lumpkin & Brigham, 2011; Miller & Le Breton-Miller, 2014). Innovation is even more important for Chinese family firms, as they are operating in an economy that is undergoing a dramatic process of economic transformation and industrial advancement. Our study examines innovation activities of family firms from the aspect of 'far-sightedness', which refers to long-term orientation of innovation activities for the future development of the firm. Adopting altruism as the theoretical approach and based on empirical data of Chinese family firms listed in Shanghai and Shenzhen Stock Exchanges during the ten-year period of 2006–2015, our study examines the influence of co-governance in family firms on their innovation activities and the moderating effects of factors drawn from the altruism approach on the direct relationship between co-governance and innovation activities.

Our study contributes to the literature in two ways. First, the primary theoretical contribution of the study lies in providing an alternative explanation for the

hidden link between intergeneration succession and innovation by focusing on the effect of co-governance on innovation. Prior research suggests that succession presents a pivotal time period for renewal and strategic changes of family firms (Cucculelli, Le Breton-Miller, & Miller, 2016; De Massis, Chua, & Chrisman, 2008; Zhao et al., 2020) and that there is greater variability in innovation investment in family firms than in nonfamily firms, depending on situational and contextual factors (Roed, 2016). Extending this line of research, we propose co-governance as a major situational factor that affects innovation activities of family firms, shedding light on the change-continuity paradox during intergenerational succession of innovation in family firms (Rondi, De Massis, & Kotlar, 2019; Zhao et al., 2020). To our knowledge, our study is the first to conceptualize co-governance as a governance structure of family firms and empirically examine its influence on strategic management in terms of innovation activities of family firms.

Second, by conceptualizing co-governance as a governance structure during the succession process and empirically testing its direct effect on innovation, our study reveals the unique role of co-governance as a novel mechanism to facilitate innovation, thus enriching family firm research. Furthermore, following the altruism approach, we draw on factors of kinship relationship, age difference, and gender difference on the basis that they are reflective of heterogeneity in intergenerational family relationships. By examining the moderating effects of these factors on altruistic behavior occurring in the succession process, our study addresses the important issue of how different intra-family relationships influence innovation through moderating the direct link between co-governance and innovation of the family firm. Our empirical results show that these factors can act as contingent conditions to moderate the influence of co-governance on innovation. Furthermore, our results suggest that co-governance results in a risk-based differentiation of innovation activities, that is, resources flow to low risk, rather than high risk but more inventive, innovations.

THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

Intergenerational Succession, Co-Governance, and Innovation

As an organizational form with a dual-system structure, family firms integrate socio-emotional wealth and business efficiency (Berrone, Cruz, & Gomez-Mejia, 2012; Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes, 2007). Accordingly, governance and decision-making in family firms tend to adopt a hierarchical structure and also involve family ethics (Schulze et al., 2003a). To examine organizational behavior and decision-making patterns of family firms, prior research has adopted various theoretical approaches, such as agency theory (Block, 2012; Morck & Yeung, 2003), stewardship theory (Miller & Le Breton-Miller, 2006), the institution-based view (Peng, Sun, Vlas,

Minichilli, & Corbetta, 2018), or the resource-based view of the firm (Habbershon, Williams, & MacMillan, 2003). However, these theoretical approaches were developed to examine organizational behavior where economic instrumentality is assumed, and thus fail to adequately deal with the uniqueness of family firms (Berrone et al., 2012). Thus, there have been explicit calls for the development of theories that are more specific to family firms (Hauck, Suess-Reyes, Beck, Prügl, & Frank, 2016; Zellweger, Kellermanns, Chrisman, & Chua, 2012).

To examine the parental altruistic behavior demonstrated in the process of intergenerational succession, our study adopts altruism as the theoretical approach to address the research question of how intergenerational co-governance influences innovation activities. Affection – feelings and emotions – is a branch of family firm research that deserves more attention (Baron, 2008; Morgan & Gomez-Mejia, 2014). From a philosophical perspective, altruism refers to a motivational state with the goal of increasing another's welfare without expectation of a reward in return (Darity, 2008; van Aaken, Rost, & Seidl, 2017). In particular, altruism in economics is considered a practical function that connects the welfare of one individual to that of others (Karra, Tracey, & Phillips, 2006; Schulze et al., 2003a). Prior research suggests that family firms are theoretically distinctive from private nonfamily firms because agency relationships in family firms are characterized by parental altruism (Lubatkin, Schulze, Ling, & Dino, 2005). As a trait that positively links a parent's welfare to that of their children (Stark, 1995), parental altruism can promote family bonds, which in turn help to align incentives and reduce information asymmetries among a family firm's key decision makers, thereby reducing the cost of governance (Lubatkin et al., 2005).

The culture of parental love has a long history in Chinese society. The ancient history book titled *Intrigues of the Warring States* more than two thousand years ago states that 'the true love of parents would be far-reaching'. This statement describes the unselfish devotion of parental altruistic behavior in Chinese society toward their children. The parent–children relationship has a duality. In addition to bearing the natural responsibility of human reproduction, parents are also responsible for engaging in societal activities such as economic production. Thus, parental altruistic behavior has been examined as a type of socio-economic behavior and can be extended through family networks of distant kinship ties (Karra et al., 2006). In particular, based on an analysis of the social structure of Chinese society, the 'differential sequence' argument proposed by the influential Chinese sociologist Fei (1948) provides a theoretical perspective to examine the altruistic parental behavior expressed in the process of intergenerational succession of Chinese family firms.

As a widely existing phenomenon in Chinese family firms, paternalism-based altruistic parental behavior can manifest in various forms (Cheng, Chou, Wu, Huang, & Farh, 2004). The parent generation places second-generation members of the family in key positions in the firm to gain managerial experience and even arranges trusted executives to assist them in the process (Zhao et al.,

2020); the founder generation could even create 'secret reserves' in the firm for future performance to prepare for the take-over of the successor, to the detriment of current achievement (Wei & Chen, 2015). Using the metaphor of 'helping to get onto horseback and escorting for a while', the study by Zhu, Li, and Ye (2018) suggested that the founder generation would initiate necessary strategic transformations of the firm, which come at the cost of the firm's current performance, to prepare for intergeneration succession. These prior studies suggest that altruism provides a useful approach to examine parental altruistic behavior, which is based on blood or marriage ties, especially the altruistic behavior of the founder generation toward their successor when preparing for intergenerational succession. Altruistic behavior facilitates the long-term orientation of family firms (Diaz-Moriana et al., 2020). Thus, following the altruism approach, we expect that co-governance as a transitional governance arrangement provides a mechanism to explain the enhanced innovation of family firms during intergenerational succession. Enhanced innovation would enable the successor generation to receive the return from the innovation after their full take-over of the family firm, so that the family wealth and business can be preserved (Zellweger, Nason, & Nordqvist, 2011) and continuity of the firm's history and tradition can be ensured (Craig & Dibrell, 2006).

On the other hand, altruistic behavior is not homogeneous among members of the firm's owning family, as it can be influenced by specific relationships between the incumbent and the successor generations (Eddleston & Kidwell, 2012; Garcia et al., 2019). We draw on Chinese yin-yang philosophy (Chen, 2002; Li, 2012, 2014, 2015) to develop a balancing approach to family firm succession and innovation. Following this approach, intergenerational succession of family firms is conceptualized as a process through which family firms seek to achieve the dual goal of smooth succession and sustainable growth by balancing the tendencies of change and continuity in the firm. More specifically, we specify change and continuity as two strategic directions (Zhao et al., 2020) that need to balance in the process of intergenerational succession. These two directions present a paradox, as they have a partially conflicting (trade-off) and partially complementary (synergy) relationship; one gives rise to the other. The change-continuity paradox includes two dimensions of the conflicting and complementary tendency. The first is the change tendency brought in by the successor as the newcomer and the continuity tendency represented by the founder as the old guard of the firm. The second is the negative inertia and positive experience possessed by the founder. Incorporating these two dimensions, founder and successor co-governance would affect innovation activities of the firm. Yin-yang philosophy illuminates the paradox between the two overall strategic directions of change and continuity as reflected in intergenerational succession because the yin-yang perspective has the strength with its capacity to simultaneously embrace change and continuity as two conflicting but complementary tendencies (Chen, 2002; Li, 2012, 2014). We employ yin-yang philosophy

to address the change-continuity paradox in the context of innovation activities initiated in intergenerational succession of family firms.

Following the altruism approach, our study draws on factors that are reflective of family relationships and posits that these factors can regulate the contingent conditions for direct relationship between co-governance and innovation. The three factors of kinship relationship (Schulze, Lubatkin, Dino, & Buchholtz, 2001; Van den Berghe & Carchon, 2003), age difference between the founder and successor (Glauben, Petrick, Tietje, & Weiss, 2009; Kimhi & Nachlieli, 2001; Zacher, Schmitt, & Gielnik, 2012), and female gender of the successor (Akhmedova, Cavallotti, Marimon, & Campopiano, 2020; Kubíček & Machek, 2019; Mussolino, Cicellin, Iacono, Consiglio, & Martinez, 2019) demonstrate different dimensions of family relationships in family firms and thus can affect the extent or level of altruistic behavior. Based on these previous studies, we propose that these three factors moderate the baseline relationship between co-governance and innovation.

Moreover, prior research has suggested that family firms have a tendency of risk aversion due to the strong desire to keep the business in the family and to continue the family legacy (Kellermanns, Eddleston, Sarathy, & Murphy, 2012; Miller & Le Breton-Miller, 2014). While co-governance has a positive effect on resource commitment to innovation, the tendency of risk aversion can prevent family firms from more inventive but high-risk innovation activities due to concerns over failure and loss of assets (Diaz-Moriana et al., 2020). Thus, it is expected that co-governance would influence the flow of resource commitment to different types of innovation in terms of risk level.

Therefore, following the altruism approach, we developed a conceptual framework to investigate how intergenerational succession affects innovation by examining the relationship between co-governance and innovation as well as the contingent conditions for this direct relationship, which are summarized in Figure 1. Our framework depicts the impact of co-governance on innovation as the baseline relationship (H1), and further proposes that this baseline relationship is contingent on the moderating effects from three factors of kinship relationship (H2), age difference (H3), and gender difference (H4), which are drawn from the altruism approach. Moreover, the framework proposes that co-governance will direct resources to different types of innovation, resulting in a differentiation of innovation activities (H5). The rationale for each of the hypothesized relationships is developed below.

Hypotheses Development

Co-governance and resource allocation for innovation. Initiation of succession is likely to lead to an increased level of strategic change (Quigley & Hambrick, 2012), especially for intergenerational succession of family firms in emerging economies like China (Zhao et al., 2020). Signaling a transitional process of intergenerational succession,
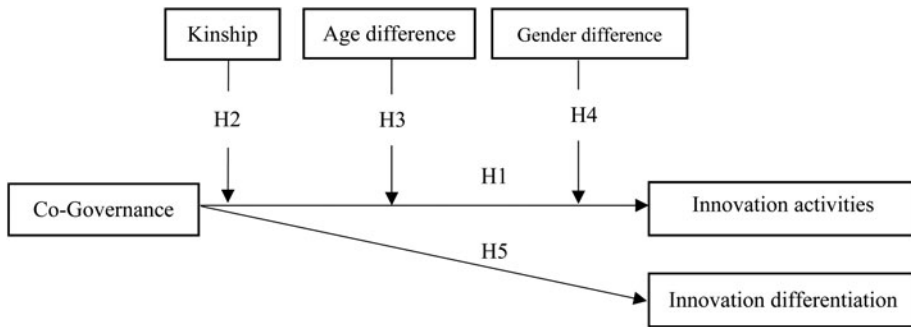
Figure 1. Conceptual framework of the study

co-governance represents a new form of governance structure in the firm, which would in turn result in a need to balance change and continuity in the firm's business strategic direction. The altruistic behavior of the founder generation toward future generations facilitates a long-term orientation, which in turn promotes risk-taking (Zahra, 2003). Although characterized with a high level of risk, innovation is crucial for the long-term growth of any firm and particularly important for family firms, as it presents a survival mechanism and increases the likelihood of long-term growth across generations (Diaz-Moriana et al., 2020; Jaskiewicz, Combs, & Rau, 2015; Zellweger et al., 2011).

From the altruistic perspective, intergenerational co-governance aims to achieve smooth intergenerational succession in family firms. With support from the founder generation, co-governance would gradually provide the successor with decision-making power and authority (Sardeshmukh & Corbett, 2011). However, intergenerational succession of family firms tends to lead to a decline of competitive advantage and firm performance (Cucculelli & Micucci, 2008), especially when the successor is less passionate about the firm than the founder, and thus also less likely to have a strong commitment to the firm (Dawson, Sharma, Irving, Marcus, & Chirico, 2015; Garcia et al., 2019; Zellweger et al., 2011). In order to prevent loss of firm competitiveness after succession, the founder generation may take measures in advance during the co-governance period to strengthen the innovation of the firm. The New Hope Group in China provides a typical example regarding arrangements for intergenerational succession. To facilitate a smooth transition of the governing power to the daughter successor, the firm founder invested heavily in innovation activities during the co-governance period so that the firm was able to upgrade its position from traditional pig-farming to eco-agriculture in the value chain. As a result, the fashion-loving daughter found that running the firm was attractive enough to make a whole-hearted commitment.

Therefore, to facilitate a successful succession while maintaining competitiveness, the altruistic behavior and the change-continuity balancing approach enable family firms to modify their risk aversion tendency by taking the risk of making

more resource commitments to innovation for the benefit of the successor. The benefits from innovation activities conducted during the co-governance period would help the successor create a defense mechanism against the possible turbulence associated with the departure of the founder generation, so that the successor is able to establish authority after taking over the firm (Brown & Lahey, 2015; Gal & McShane, 2012; Van Buren & Safferstone, 2009). We propose that co-governance provides a mechanism to shed light on the change-continuity paradox of innovation. This is because family firms tend to take a long-term orientation when pursuing intergenerational succession (Diaz-Moriana et al., 2020; Lumpkin & Brigham, 2011) and innovation activities represent firm investment in future growth, indicating a long-term strategy to establish sustainable competitive advantage (Coad & Rao, 2011; Jaskiewicz et al., 2015).

On the other hand, inner family conflicts can occur due to agency problems and goal diversity among family members (Eddleston & Kellermanns, 2007; Schulze, Lubatkin, & Dino, 2003b), contributing to the change-continuity paradox with regard to innovation of family firms (Chrisman, Chua, Kellermanns, & Chang, 2007; De Massis et al., 2015; Rondi et al., 2019). More specifically, the founder and successor can hold different attitudes regarding the firm's commitments to innovation. For instance, the older generation with an inertia tendency could be more conservative and have a trend of risk aversion toward innovation, or the older generation may intend to stay in control longer and thus not be keen to hand control to the younger generation (Brown, Lawrence, & Robinson, 2005; Cadieux, Lorrain, & Hugron, 2002). These conflicting aspects of family firm co-governance need to be addressed when analyzing the impact of co-governance on innovation.

The extent of negative effects from inner family conflicts is determined by whether the conflicts can be constructively managed, mitigated, and resolved (Qiu & Freel, 2020). Task, process, and relationship conflicts are identified as three types of inner family conflict (De Dreu & Van Vianen, 2001), and among the three, relationship conflict is more likely to lead to negative effects (Jehn, 1997). Altruistic behavior can be helpful to mitigate negative effects of relationship conflict. When facing relationship conflict, family firms can effectively utilize the talents and opinions of family members because of altruistic behavior, whereas nonfamily firms can be full of animosity (Kellermanns & Eddleston, 2004).

Constructive conflict resolution due to altruistic behavior is more evident for family firms with a co-governance structure when the firm is experiencing the succession process, which presents a structure of shared leadership. Shared leadership is defined as a dynamic and interactive influence process among individuals in teams for which the objective is to lead one another to the achievement of organizational goals (Pearce & Conger, 2002; Serban & Roberts, 2016). Task cohesion and internal team environment are identified as two key factors that facilitate the emergence and positive consequences of shared leadership (D'Innocenzo, Mathieu, & Kukenberger, 2016; Serban & Roberts, 2016). Task cohesion is

defined as the commitment to the team's goals and shared attraction of individuals in the leadership team (Carless & De Paola, 2000), while internal team environment refers to team members' efforts at providing emotional and psychological support to one another through encouragement and recognition of individual and team contributions and accomplishments (Carson, Tesluk, & Marrone, 2007).

Co-governance of family firms presents an ideal context for the presence of these two factors. First, signifying intergenerational succession, co-governance is likely to facilitate task cohesion between the founder and successor as a shared leadership team. With a high level of altruism, family members are more considerate of each other and loyal to the family business (De Massis, Kotlar, Mazzola, Minola, & Sciascia, 2018; Rondi et al., 2019), although altruistic behavior may also lead to agency problems due to its association with limited rationality and cronyism (Schulze et al., 2003a). Moreover, co-governance of the intergenerational team can produce even stronger cohesion with parental altruistic love toward the offspring for the firm's strategic succession (Ensley & Pearson, 2005). Second, aiming at a smooth completion of intergenerational succession, co-governance provides an ideal internal team environment for shared leadership. When team members have a similar understanding of their main team objectives and focus on accomplishing collective goals, shared purpose arises as the key dimension of an internal team environment (Carson et al., 2007). Family firms are heavily oriented toward long-term initiatives (Miller & Le Breton-Miller, 2005), as they have a strong desire to continue the family legacy and to keep the business in the family for generations (Kellermanns et al., 2012). With a high level of altruism and aiming to facilitate intergenerational succession, the founder and successor generations tend to be willing to tolerate each other and to make sacrifices when necessary.

In sum, we propose that co-governance provides a novel mechanism to resolve the paradox (De Massis et al., 2015) by stimulating innovation willingness. While risk aversion tendency and inner family conflicts are identified as barriers for innovation of family firms, co-governance of the family plays an essential role to mitigate and reduce their negative influence on innovation. Thus, we develop the following baseline hypothesis:

> *Hypothesis 1: Co-governance of the family firm positively affects the firm's innovation activities.*

Moderating effect of kinship relationship. Prior research suggests that kinship relationship-based altruistic behavior is an essential feature that distinguishes family firms from nonfamily firms (Chrisman, Chua, & Zahra, 2003; Karra et al., 2006). Based on the altruism principle, it is quite common that configuration of assets and authority is more kinship-based rather than merit-based (Chrisman et al., 2003). Research has found that altruistic behavior in family firms varies according to the level of closeness within kinship relationships (Karra et al.,

2006; Lubatkin, Ling, & Schulze, 2007). Based on the level of closeness, kinship relationships in family firms are classified as members of three types of family composition: nuclear family, extended family, and composite family (Ensley & Pearson, 2005; Gersick, Davis, Hampton, & Lansberg, 1997; Karra et al., 2006). Built on these previous studies, co-governance can be structured into two major types of parent–child co-governance (including father–son, father–daughter, mother–son, and mother–daughter relationships) and other intergenerational co-governance (including uncle–nephew, uncle–niece, aunt–nephew, and aunt–niece relationships). The likelihood of agency problems, which arise from the conflict of interests between the firm's management and its shareholders, is much smaller for the parent–child relationship than other kinship relationships in the TMT of the family firm (Ensley & Pearson, 2005; Schulze et al., 2001; Van den Berghe & Carchon, 2003).

Chinese society has long attached great importance to blood and kinship relationships. As proposed by Chinese sociologist Fei (1948), Chinese society is structured by following the kinship-based differential sequence. This differential sequence is described as similar to the ripple effect – where each person is the center of the circles that their social influence has reached, just like ripples expanding across the water when a pebble is dropped in a pond. Kinship relationships are centered on a focal individual, spread outward, and become weaker and more distant. This kinship relationship-based differential sequence not only acts as a central pattern to structure social relations but also plays an important role in allocating family-owned resources (Li, 2002).

Based on the above-discussed linkage with kinship relationship-based altruistic behavior, we propose that the kinship relationship between the founder and successor affects the strength of altruistic support when paving the way for intergenerational succession. The parent–child relationship will lead to a higher level of altruistic behavior and stronger parental support from the founder generation than other intergenerational relationships (Galperti & Strulovici, 2017; Van den Berghe & Carchon, 2003). When the firm is to be succeeded by a direct descendant, the founder generation would be more concerned about potential difficulties after the successor's take-over of the firm, such as lack of authority in governing the firm, weak capability for risk-taking, and the need to improve technology and position in the value chain. As a result, the founder generation is likely to make stronger commitments to innovation. Thus, under the watch of the founder generation, the firm will enhance its innovation during the co-governance period.

On the other hand, while parental altruistic behavior can be extended through family networks of distant kinship ties, its strength becomes diluted for distant kin and ethnic ties (Karra et al., 2006). Thus, when the successor comes from a kinship relationship in the extended family, such as nephew or niece, rather than from a nuclear family, the altruistic support toward the successor will be weaker. Based on this argument, we propose a positive moderating effect

of the kinship relationship on the direct link between co-governance and innovation.

> *Hypothesis 2:* *The kinship relationship positively moderates the direct relationship between co-governance and innovation activities, so that a parent-child co-governance is more likely to lead to increase of innovation activities than co-governance in other types of intergenerational kinship relationships.*

Moderating effect of age difference. It is common that in the succession process, the founder's altruistic behavior derived from altruistic parental support toward offspring is coupled with intertemporal decision-making (Diaz-Moriana et al., 2020; Kraiczy et al., 2015; Lubatkin et al., 2007; Lumpkin & Brigham, 2011). Prior research has suggested that the age difference between the predecessor and successor as well as the predecessor's age are important factors influencing succession of family businesses (Cabrera-Suárez, De Saá-Pérez, & García-Almeida, 2001; Calabrò, Minichilli, Amore, & Brogi, 2018; Davis & Harveston, 1998; Glauben et al., 2009). When the incumbent controller of the family firm gets older, he/she tends to be more risk averse and is more likely to increase commitment to the family firm (Davis & Harveston, 1998). Moreover, as the predecessor advances in age, he/she may use preparation for succession as a mechanism to demonstrate his/her commitment to the future of the family firm while simultaneously controlling risk. Thus, strategic changes, such as initiating innovation activities in the family firm, tend to occur during the transitional period of succession, rather than after the successor takes over the firm (Garcia et al., 2019). This is not only due to the need for gradually building up authority for the successor, but also to prevent the risk associated with potential turbulence after the successor has taken over the firm (Grote, 2003). That is, with increase of the predecessor's age, the consciousness of a need to prepare for the inevitable transition of control over the firm will lead to a concomitant increase in succession planning.

Following a similar line, intertemporal decision-making logic can also apply to family firm decision-making regarding commitments to innovation activities during the co-governance period. The age difference influences the relationship quality between the founder and successor generations (Cabrera-Suárez et al., 2001) and thus becomes a factor that would have an impact on the family firm's commitments to innovation activities during the transitional succession period. The time frame and timing are central for intergenerational succession of family firms (Le Breton-Miller et al., 2004). The bigger the age gap between the two generations, the more likely the co-governance would lead to higher commitments to innovation activities. The rationale for this relationship is twofold. First, the bigger the age difference between the founder and successor generations, the stronger the paternalistic love of the founder toward the successor, resulting in a higher level of commitment to support the succession, including enhanced innovation activities. The old Chinese saying that the 'older cow loves her calf more' provides a

reflection of the linkage between age gap and parental love. Second, a bigger age gap between the founder and successor tends to indicate the more advanced age of the founder generation, and this age gap would stimulate a sense of urgency to proceed with the succession (Glauben et al., 2009; Kimhi & Nachlieli, 2001; Zacher et al., 2012). Thus, the founder generation will feel pressure to prepare for handing over control of the firm. In contrast, a smaller age gap between the founder and successor indicates the capability of the founder to run the firm, and thus the need for succession would not be as strong. Therefore, we propose an influence of age difference on the linkage between co-governance and innovation activities, and expect that:

> *Hypothesis 3: Age difference between the founder and successor positively moderates the direct relationship between co-governance and innovation activities, so that the bigger the age difference is, the more likely co-governance will lead to an increase of innovation activities.*

Moderating effect of gender difference. Research in economics and social psychology has long paid attention to the gender difference in altruistic behavior (Andreoni & Vesterlund, 2001; Brush, 1992; Schwartz & Rubel, 2005). Prior research has suggested that by bringing up a daughter, a CEO can alter their own altruistic preference (Fiese & Skillman, 2000). Following this line of research, we propose that a female successor to the family firm would further stimulate the founder generation's feeling of 'far-sighted' parental love toward the successor. In comparison to a male successor, a female successor would confront unique challenges when taking over a family firm, as she often faces discrimination and stereotyping due to both societal stereotypes/prejudices and family hierarchies (Hytti, Alsos, Heinonen, & Ljunggren, 2017; Mussolino et al., 2019; Vera & Dean, 2005). The preference for males over females as the successor is widely found in the business world (Bennedsen, Nielsen, Pérez-González, & Wolfenzon, 2007; Cabrera-Suárez et al., 2001; Cao et al., 2015; Haberman & Danes, 2007). As a result, when a female member of the owning family eventually becomes the successor, the founder generation would take greater care of the female successor by acting as a mentor and protector because the founder is concerned about the female successor's lack of authority (Deng, 2015; Kubíček & Machek, 2019; Smythe & Sardeshmukh, 2013).

Therefore, in order to prepare for succession to a female descendant, the founder generation is more likely to sense a strong need to take control of the succession process for taking over by a female successor (Chen, Fang, MacKenzie, Carter, Chen, & Wu, 2018; Overbeke, Bilimoria, & Perelli, 2013), and it is especially so when the incumbent generation are females (Cadieux et al., 2002; Ferrari, 2019). When the incumbent and successor have a father–daughter relationship, the father tends to see his daughter as a business partner to share decision-making of the firm but at the same time as his child who needs protection and support (Hollander & Bukowitz, 1990; Vera & Dean, 2005). This parental support is

more likely to influence future directions of the firm, such as enhancing innovation activities rather than daily operations (Glover, 2014).

The cultural and social context in different countries can also influence intra-family succession in general and a female as the successor in particular (Cao et al., 2015; Deng, 2015; Mathew, 2016). In Chinese society, the traditional saying of 'raising the daughter with caring love, and raising the son with tough love' reflects the Chinese parenting style toward gender difference of offspring. This saying indicates that paternalistic love tends to pay special attention to female offspring. China has provided some typical examples where the founders of family firms took extra care of female successors, such as Yang Guoqiang, Chairman of Country Garden Group; Zong Qinghou, Chairman of Wahaha Group; and Liu Yonghao, Chairman of the New Hope Group. In these cases, the founders of the major Chinese family firms had long prepared their daughters' succession by letting the potential female successors to enter their firms early, and gradually take key positions so that the successors could be trained to take over the firms.

In summary, when a female successor is to take over the firm, the founder generation is more likely to pay more attention to planning a smooth succession by providing more support to the successor through enhancing innovation activities during the co-governance period. Thus, we propose a positive moderating effect of the successor's female gender on the direct link between co-governance and innovation activities, and expect that:

> *Hypothesis 4: Female gender of the successor positively moderates the direct relationship between co-governance and innovation activities. That is: if the successor is a female descendant of the founder, it is more likely co-governance will lead to an increase of innovation activities.*

Co-governance and differentiation of innovation activities. A long-term perspective plays a significant role in family firms when exhibiting strategic behavior (Brigham, Lumpkin, Payne, & Zachary, 2014; Lumpkin & Brigham, 2011). On the one hand, firms with long-term orientations pursue continuity as the strategic goal of the firm and thus tend to invest in less risky projects than firms with short-range perspectives (Gentry, Dibrell, & Kim, 2016; Zellweger, 2007). On the other hand, a long-term orientation promotes intergenerational succession by bringing in the successor as a strategic change, which in turn leads to risk-taking tendency due to the altruistic behavior of the family firm leaders toward future generations (Zahra, 2003), and this tendency can result in a positive effect of co-governance on innovation. Following the balancing approach from Chinese yin-yang philosophy, co-governance provides a mechanism to incorporate change and continuity as two seemingly contrary but actually complementary tendencies (Chen, 2002; Li, 2012, 2014). While co-governance leads to an increase of resource commitment to innovation so that change can be facilitated through smooth succession of the firm, co-governance can also maintain continuity, resulting in a differentiation of

innovation activities, that is, resources tend to be allocated to innovation activities that represent a low, rather than high, level of risk. The rationale for this innovation differentiation is twofold.

First, due to a risk aversion tendency that is generated from a desire for continuity and a concern about losing socio-emotional wealth and weakening control over the family firm (Chrisman & Patel, 2012), the more inventive but high-risk innovation activities can be suppressed during the succession process. Inventive innovation activities tend to require application of specialized technology/management know-how, and there is a lack of these requisite skills in family firms (Chrisman, Chua, & Sharma, 2005). Furthermore, these activities are usually executed by technological experts and managed by professional executives (McDermott & O'Connor, 2002), who are less likely to be members of the owning family. Concern about losing control over the firm to professional executives would lead to a decline of resources allocated to radical but high-risk innovations (Chrisman et al., 2012; Rondi et al., 2019).

Second, representing the change tendency of co-governance, a smooth intergenerational succession would have a higher level of priority for the firm, and resource commitment to innovation activities is needed to serve this purpose. However, more inventive innovation can be neglected because such innovation usually involves a long process with uncertain return on investment inputs. Resource inputs into such investment projects could generate a negative effect on the performance of the firm in the near future (Gentry et al., 2016; Zellweger, 2007), and thus undermine the establishment of authority by the successor when she/he takes over control of the firm. As a result, innovation resources are more likely to be allocated to the more traditional and incremental areas, rather than to expand to the more creative and risky areas. Thus, we have the following hypotheses:

> *Hypothesis 5: Co-governance of the family firm would have a positive effect on low-risk innovation activities.*

> *Hypothesis 5a: Co-governance of the family firm would not have a positive effect on high-risk innovation activities.*

METHODS

Data and Sample

The starting point for constructing our sample was the firms listed in the Shanghai and Shenzhen Stock Exchanges. We then focused on the family firms. Following prior research (Gomez-Mejia, Makri, & Larraza-Kintana, 2010; Gomez-Mejia et al., 2014), the criteria for family firms were established as follows: (1) the controller of the firm can be traced to a person or a family which is linked by blood or

marriage relationships and (2) either directly or indirectly, the controller of the firm is the largest shareholder of the listed company.

The period of our study spanned ten years (2006–2015). Data were obtained from the two databases of China Securities Market and Accounting Research (CSMAR) and Wind Information Technology (WIND). To construct our key explanatory variable of co-governance, we identified and confirmed kinship relationships through several ways, including: (1) firms' annual reports, prospectuses, and listing announcements; (2) for unknown kinship relationships in a family firm, we identified the kinship relationships with the owning family of the firm through social media searches for all board directors, board supervisors, and members of the TMT; and (3) based on the list of board of directors, board of supervisors, and the TMT over the years, we traced the changes of positions for the members of the owning family in the family firm in order to determine the stage of intergenerational succession of the family firm. We excluded family firms from finance and insurance sectors to have a more comparable sample set. We also excluded firms for which data for key variables of the study were missing. For the firms with partially missing or suspicious data, we cross-checked the two databases to complement the missing data.

Eventually, we had 4,694 firm-year observations in our sample, including 874 firm-year observations for co-governance (18.72%) and 3,820 firm-year observations for non-co-governance family firms. For the industrial distribution, 72.66% of our full sample and 78.36% of our sample for co-governance family firms come from the manufacturing sector.

The annual distribution of our sample in terms of co-governance and non-co-governance family firms is presented in Table 1.

Variables and Measurements

Dependent variable. The dependent variable of innovation can be measured either by its input or its output and we adopted both measures. Following prior research (Chrisman & Patel, 2012; Devers, McNamara, Wiseman, & Arrfelt, 2008; Miller & Le Breton-Miller, 2005), R&D intensity as innovation input was measured as the ratio of R&D expenditure to the sales of the firm. As a firm's commitment to innovation is associated with risk and generally does not produce immediate pay-offs, R&D intensity is able to indicate a firm's long-term orientation, making it particularly suitable to test our conceptual framework derived from the altruism perspective in terms of parental love-based altruistic behavior during the intergenerational succession process. For the robust test, we measured innovation by output for which the number of patent applications was used. This is also a widely used measure for innovation (Piperopoulos, Wu, & Wang, 2018; Ren, Eisingerich, & Tsai, 2015; Wu, Wang, Hong, Piperopoulos, & Zhuo, 2016). Furthermore, to examine the relationship between co-governance and differentiation of innovation activities, the focal firm's application numbers of inventive

Table 1. Sample distribution by year

Year	Full sample N	Co-governance firms		Non-co-governance firms	
		N	%	N	%
2006	195	21	10.76	174	89.23
2007	265	30	11.32	235	88.67
2008	309	33	10.67	276	89.32
2009	423	52	12.29	371	87.70
2010	678	84	12.38	594	87.61
2011	878	118	13.43	760	86.56
2012	973	139	14.28	834	85.71
2013	982	135	13.74	847	86.25
2014	986	136	13.79	850	86.20
2015	982	126	12.83	856	87.16
Total	4,694	874	18.72	3,820	81.28

patents versus non-inventive patents (patents of utility models and designs) were adopted to measure high versus low-risk innovation, respectively.

Independent and moderator variables. On the basis of involvement in governance and management by family members from both the founder and successor generations, we used a binary measure of co-governance (Anderson & Reeb, 2003; Gomez-Mejia et al., 2010; Villalonga & Amit, 2006). The binary co-governance measure distinguished co-governance firms (equal to 1) from non-co-governance firms (equal to 0). More specifically, we classified a firm as having co-governance when it meets the condition that family members (defined as a person related by blood or by marriage to the owning family) of both the founder and successor generations serve in the TMT of the firm.

To examine the contingency conditions on which co-governance influences innovation activities, we introduced three moderating variables of kinship relationship, age difference, and gender difference. Kinship relationship is operationalized as a binary measure. If the firm founder and the successor have a parent–child relationship, it takes a value of 1 and all other intergenerational kinship relationships take a value of 0. The age difference is measured as a continuous variable by subtracting the successor's age from the founder's age. The gender difference is measured as a binary variable, taking the value of 1 for a female and 0 for a male successor.

Control variables. We included a comprehensive set of control variables. In controlling influence from firm characteristics, firm age (Anderson & Reeb, 2003) and firm size (Berrone, Cruz, Gomez-Mejia, & Larraza-Kintana, 2010) are included. Firm age is measured as the natural logarithm of the number of years since its foundation, whereas firm size is operationalized as the natural logarithm of the assets.

The governance structure of the firm can affect the TMT's decision-making, and thus influences the firm's behavior in innovation investment. In this regard, we controlled the three variables of dual role of CEO and board chairman (Dual), ratio of independent board directors to the full board members (Indep), and proportion of the shareholdings by the TMT members (ESH). Succession legitimacy was included and captured by the ratio of all family members' shareholdings to the total firm stock (FSH), as a high level of family shareholding tends to lead to underinvestment in innovation activities (Block, 2012; Chrisman & Patel, 2012). Asset-liability ratio (LEV) and return on assets (ROA) were included as they reflect the available slack of the firm for R&D investment. In addition, to control influence from the macro-economic environment and industrial sectors, we include the dummy variables of time (year) and industry.

The definitions and measurements of the main variables are shown in Table 2.

Descriptive Statistics and Correlation Coefficients

Table 3 presents descriptive statistics for the main variables included in the study, split into two samples of co-governance firms and total family firms. A cross-analysis shows that the maximum, minimum, mean, and standard deviation for R&D intensity of co-governance firms are 0.198, 0, 0.03, and 0.033, respectively. The corresponding values for overall family firms are 0.198, 0, 0.03, and 0.027, respectively, indicating a higher level of innovation investment for co-governance family firms.

Table 4 presents the correlation matrix for the main variables included in the study. The correlation between co-governance and R&D intensity is significant and positive ($r = 0.067$, $p < 0.01$). For the three moderating variables, kinship and gender are not significantly correlated with R&D intensity, whereas the age difference is significantly correlated with R&D intensity ($r = 0.066$, $p < 0.1$). Importantly, no correlation index between any variables included in the study is larger than 0.3, indicating multicollinearity is not a concern for empirical analysis of the study.

RESULTS

Hypotheses Testing: Co-Governance, Innovation Activities, and Moderating Effects

We adopted moderated ordinary least squares (OLS) as the modeling method for regression analysis. In order to avoid potential multicollinearity caused by adding moderating terms, we mean-cenetred the independent and moderating variables. Six model estimations were performed. Table 5 reports the results concerning the effects of impacting factors on innovation investment.

Model 1 included the co-governance independent variable and all control variables. This variable is significant ($\beta = 0.003$, $p < 0.05$), indicating a positive

Table 2. Variable definition and measurement

Variable type	Variable symbol	Variable measurement
DV	R&D intensity	Ratio of R&D expenditures to the sales of the firm
	Patent	Number of patent applications
	Patenti	Application number of inventive patents
	Patentud	Application number of non-inventive patents (patent of utility model and design)
IV	Co-governance	Binary measure. Taking value 1 when both the founder and successor generations of the owning family take key positions in the governing body; otherwise taking value 0
Moderator variables	Kinship	Binary measure with parent–child relationship between the firm founder and the successor taking value 1 and all other kinship relationships between the founder and the successor taking value 0
	Age difference	Continuous variable measured by subtracting the successor's age from the founder's age
	Gender difference	A binary variable, taking value of 1 when the successor is female and 0 for a male successor
Control variables	Firm age	Natural logarithm of the number of years since its foundation
	Firm size	The natural logarithm of the assets
	Dual	Binary measure taking value 1 when the same person takes dual role of CEO and board chair, otherwise taking value 0
	Indep	Ratio of the number of independent board directors to the total number of board directors
	ESH	Ratio of TMT shareholding to the total firm stock
	FSH	Ratio of all family members' shareholding to the total firm stock
	LEV	Asset-liability ratio = total liabilities/total assets
	ROA	Return on assets = net profit/total assets
	Year	The sample interval is from 2006 to 2015, with a total of nine annual dummy variables
	Industry	According to the CSRC industry code classification, a total of 18 industry dummy variables

effect of co-governance on R&D intensity. Thus, Hypothesis 1 is supported. Model 2 added three moderator variables to Model 1. Co-governance remains significant in Model 2 ($\beta = 0.004$, $p < 0.05$), providing further support for Hypothesis 1. For the three moderator variables, kinship and gender are not significant, whereas the age difference is significant ($\beta = 0.024$, $p < 0.1$).

Models 3–5 added three moderators and their moderating terms respectively to Model 1 to test moderating effects on the direct relationship between co-governance and R&D intensity. In Model 3, the moderating term of kinship is significant ($\beta = 0.023$, $p < 0.1$), indicating a positive moderating effect of kinship. Similarly, moderating terms are significant in Models 4 and 5 by involving the two moderators of age difference ($\beta = 0.04$, $p < 0.01$) and gender ($\beta = 0.008$, $p < 0.05$), respectively, indicating positive moderating effects of age difference and gender. In summary, modeling results from Models 3–5 provide empirical support for Hypotheses 2–4 regarding moderating effects of the three moderator variables. Model 6 presented a full model analysis by including all the independent moderator and control

Table 3. Descriptive statistics for main variables

Variables	Co-governance firms					Family firms				
	N	*Min*	*Max*	*Mean*	*SD*	N	*Min*	*Max*	*Mean*	*SD*
R&D intensity	874	0	0.198	0.038	0.033	4,694	0	0.198	0.034	0.027
Patent	874	0	1,073	19.654	66.411	4,694	0	1,121	15.591	48.274
Patenti	874	0	503	5.299	23.187	4,694	0	550	5.702	22.162
Patentud	874	0	570	14.354	46.595	4,694	0	600	10.645	34.317
Kinship	874	0	1	0.234	0.424	1,845	0	1	0.225	0.418
Age difference	874	2	49	23.867	7.112	1,845	1	49	23.968	6.329
Gender difference	874	0	1	0.315	0.465	1,845	0	1	0.207	0.406
Firm age	874	0	3.295	2.384	0.513	4,694	0	3.401	2.341	0.559
Firm size	874	19.212	25.290	21.575	1.043	4,694	16.508	25.472	21.434	0.954
Dual	874	0	1	0.335	0.472	4,694	0	1	0.350	0.477
Indep	874	0.250	0.600	0.360	0.042	4,694	0.142	0.666	0.373	0.052
ESH	874	0	0.897	0.233	0.240	4,694	0	0.897	0.243	0.242
FSH	874	0.053	0.766	0.403	0.171	4,694	0.528	0.765	0.398	0.177
LEV	874	0	2.071	0.389	0.454	4,694	0	2.071	0.342	0.406
ROA	874	−0.004	0.132	0.504	0.038	4,694	−0.004	0.132	0.501	0.037

Table 4. Correlation matrix for main variables

Variables	R&D intensity	Patent	Patenti	Patentud	Co-governance	Kinship	Age difference	Gender difference	Dual	Indep	ESH	FSH	ROA	LEV
R&D intensity	1													
Patent	0.067***	1												
Patenti	0.105***	0.879***	1											
Patentud	0.053***	0.951***	0.690*	1										
Co-governance	0.067***	0.130**	−0.108*	0.051**	1									
Kinship	0.017	0.084**	0.039**	0.092**	0.020	1								
Age difference	0.066*	0.141*	0.125*	0.138*	−0.016	−0.612*	1							
Gender difference	0.033	0.064	0.017	0.083*	0.257*	−0.113*	0.049*	1						
Dual	0.118*	0.046*	0.033	0.048*	−0.015	0.016	0.013	0.043	1					
Indep	0.094*	0.051*	0.029*	0.045*	−0.013*	−0.040	0.029	0.018	0.127**	1				
ESH	0.200***	−0.046*	−0.043*	−0.042*	−0.020	−0.028	0.061*	−0.036	0.153**	0.088*	1			
FSH	0.096*	0.011	−0.021	0.027	0.025	0.009	0.007	0.023	0.019*	0.066*	0.481*	1		
ROA	0.016***	0.016**	0.009*	0.019*	−0.017	−0.025	0.011	0.031*	0.012	−0.004	0.054*	0.105*	1	
LEV	−0.272***	−0.019***	−0.036***	−0.007***	−0.055*	−0.036	−0.054*	−0.001	0.009*	−0.032*	−0.222*	−0.169*	−0.226***	1

Notes: ***p < 0.01, **p < 0.05, *p < 0.10.

Table 5. Regression results for effects of co-governance on R&D intensity

Variables	R&D intensity					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Co-governance	0.003** (2.05)	0.004** (2.51)	0.002 (1.48)	0.000 (0.08)	0.003* (1.91)	−0.010 (−1.25)
Kinship		0.000 (0.20)	−0.007 (−0.36)			−0.003 (−1.05)
Age difference		0.024* (1.69)		0.000 (0.32)		−0.00 (−0.31)
Gender difference		0.001 (0.95)			0.007 (0.68)	0.070** (2.14)
Co-governance × Kinship			0.023* (1.75)			0.022* (1.69)
Co-governance × Age difference				0.004*** (2.77)		0.003* (1.78)
Co-governance × Gender difference					0.008** (2.03)	0.007** (1.96)
Firm age	−0.005*** (−3.59)	−0.004*** (−2.85)	−0.005*** (−3.69)	−0.005*** (−2.97)	−0.000*** (−3.18)	−0.005*** (−3.05)
Firm size	−0.001(−1.57)	−0.003 (−0.36)	−0.001 (−1.46)	−0.005 (−0.54)	−0.006 (−0.67)	−0.000 (−0.14)
Dual	0.002 (1.54)	0.005 (0.31)	0.002 (1.44)	0.006 (0.36)	0.000 (0.06)	0.005 (0.34)
Indep	0.028** (2.19)	0.016 (0.98)	0.014 (1.02)	0.017 (1.03)	0.022 (1.42)	0.018 (1.07)
ESH	0.015*** (5.10)	0.012*** (3.55)	0.022*** (3.99)	0.014*** (3.65)	0.015*** (4.36)	0.013*** (3.70)
FSH	−0.004 (−1.00)	−0.002 (−0.38)	−0.002 (−0.55)	−0.002 (−0.47)	−0.004 (−0.92)	−0.003 (−0.58)
ROA	0.017 (1.48)	0.024* (1.79)	0.019 (1.51)	0.023* (1.73)	0.022 (1.63)	0.022* (1.65)
LEV	−0.015*** (−7.54)	−0.018*** (−6.99)	−0.016*** (−7.12)	−0.018*** (−7.42)	−0.017*** (−7.28)	−0.019*** (−7.15)
Constant	0.016 (0.78)	−0.001 (−0.04)	0.021 (0.92)	0.003 (0.11)	0.058 (0.21)	0.000 (0.01)
Year	Control	Control	Control	Control	Control	Control
Industry	Control	Control	Control	Control	Control	Control
Observations	4,694	1,845	874	874	874	874
Adj. R^2	0.313	0.319	0.326	0.321	0.323	0.326

Notes: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$; t-value is provided in the bracket.

variables, and moderating terms. All three moderating terms remained significant in Model 6 ($\beta = 0.022$, $p < 0.1$; $\beta = 0.003$, $p < 0.1$; $\beta = 0.007$, $p < 0.05$, respectively), providing further support for Hypotheses 2–4 regarding the moderating effects of the study.

Hypotheses Testing: Co-Governance and Differentiation of Innovation

Table 6 presents the results for Hypothesis 5a and Hypothesis 5b regarding the impact of co-governance on low versus high-risk innovation. We took a lag of two years for these two variables, based on the understanding that it takes time for the current R&D investment to generate results of innovation outcome in terms of patent applications. The results from Model 7 suggest that co-governance has a significant effect on patent applications with low risk ($\beta = 0.291$, $p < 0.01$), supporting H5a. On the other hand, as shown in Model 9, co-governance does not have a significant effect on high-risk innovation, providing support to Hypothesis 5b. In order to increase the confidence in these results, we performed robust tests by controlling the family shareholding ratio (FSH) at a level above 20% of the firm stock. The results from Models 8 and 10 are qualitatively same as those from Models 7 and 9, providing further support for Hypothesis 5a and Hypothesis 5b.

Thus, our modeling results suggest that co-governance leads to a significant increase of low-risk innovation but does not have significant influence on high-risk innovation. This finding demonstrates that increased innovation activities during the co-governance period aim mainly at stabilizing the firm's operations and consolidating its market position in order to have a smooth succession, but not at the inventive innovations that are more important for the firm's future development. The altruistic caring and support of the co-governance is more manifested as the 'far-sighted', rather than the 'deep-minded' effect, which can strength the overall innovation activities but the resources are flowing to the low-risk and application-type innovations, with the neglect of deep innovation.

Robustness Tests

Using an alternative measure for the dependent variable. We ran additional tests to examine the robustness of our findings and to check whether these findings were due to potential endogeneity biases. First, we adopted an alternative measure of our dependent variable by using patent application numbers of family firms to test the influence of co-governance on R&D investment and the moderating effects of this influence. Patents are widely used as a measure of firm innovation activities (e.g., Acharya & Xu, 2017; Guo, Pérez-Castrillo, & Toldrà-Simats, 2019; He & Tian, 2013). Following these empirical studies, we used the logged number of patent applications of the firm to measure the firm's innovation. The rationale for using patent application numbers in our study as the alternative measure for R&D spending is twofold: (1) the practical difficulty in obtaining accurate data

Table 6. Co-governance and innovation differentiation

Variables	LnPatentud Model 7	LnPatentud Model 8 (FSH ≥ 20%)	LnPatenti Model 9	LnPatenti Model 10 (FSH ≥ 20%)
Co-governance	0.291***	0.338***	0.028	0.022
	(3.13)	(3.53)	(0.36)	(0.27)
Firm age	−0.032	−0.052	−0.042	−0.037
	(−0.33)	(−0.52)	(−0.50)	(−0.44)
Firm size	0.247***	0.233***	0.419***	0.425***
	(3.68)	(3.36)	(7.63)	(7.58)
Dual	−1.812*	−0.178*	−0.916	−0.085
	(−1.73)	(−1.66)	(−1.05)	(−0.96)
FSH	0.290	0.450	−0.727	−0.187
	(0.93)	(1.35)	(−0.26)	(−0.65)
ESH	−0.203	−0.197	−0.020	-0.015
	(−0.88)	(−0.84)	(−0.10)	(−0.08)
Indep	−1.353	−1.624	0.760	0.849
	(−1.33)	(−1.52)	(0.85)	(0.92)
LEV	−0.648***	−0.557***	−0.526***	−0.542***
	(−4.19)	(−3.46)	(−4.31)	(−4.35)
ROA	0.718	0.970*	0.850*	0.853
	(1.15)	(1.71)	(1.94)	(1.03)
Constant	−3.496**	−3.210**	−8.408***	−8.547***
	(−2.22)	(−1.98)	(−6.43)	(−6.41)
Year	Control	Control	Control	Control
Industry	Control	Control	Control	Control
Observations	2,726	1,391	2,726	1,391
Adj. R^2	0.094	0.095	0.140	0.142

Notes: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$; t-value is provided in the bracket.

on R&D spending by family firms and (2) the inaccuracy of R&D spending in reflecting allocation of the investment resources by a firm to innovation activities with different levels of risk. In our regression analysis, we took a lag of two years for the dependent variable, as innovation tends to be a long process and there would be an interval between R&D spending as the innovation input and the patent as the innovation output.

Table 7 presents the results of the robustness test that adopted logged patent applications as the alternative measure of the dependent variable (DV). In Model 11, the significant effect ($\beta = 0.206$, $p < 0.05$) of co-governance on the DV provides further support for Hypothesis 1. Models 13–15 added the three moderator variables (kinship, age difference, and female gender) and their moderating terms to Model 11, respectively. The results demonstrated that moderating effects are significant for kinship ($\beta = 0.191$, $p < 0.1$), age difference ($\beta = 0.287$, $p < 0.1$), and gender ($\beta = 0.747$, $p < 0.01$), respectively. Model 16 included all the explanatory variables, and the moderating effects of the three moderator variables remained qualitatively the same. These results indicate the robustness of the empirical findings from our regression analyses.

Table 7. Robustness test: Effect of co-governance on innovation activities

Variables	LnPatent Model 11	LnPatent Model 12	LnPatent Model 13	LnPatent Model 14	LnPatent Model 15	LnPatent Model 16
Co-governance	0.206** (2.48)	0.176* (1.78)	0.120* (1.95)	0.453 (1.13)	0.064 (0.57)	1.259** (2.22)
Kinship		0.856*** (5.52)	0.539*** (3.68)			0.581*** (2.79)
Age difference		0.033*** (3.28)		−0.021 (−1.61)		0.004 (0.28)
Gender difference		0.191 (1.44)			−0.375 (−1.50)	−0.360 (−1.47)
Co-governance × Kinship			0.191* (1.87)			0.554* (1.79)
Co-governance × Age difference				0.287* (1.75)		0.047** (2.24)
Co-governance × Gender difference					0.747*** (2.59)	0.754*** (2.63)
Other variables	Control	Control	Control	Control	Control	Control
Observations	2,726	1,327	612	612	612	612
Adj. R^2	0.107	0.173	0.129	0.130	0.131	0.190

Notes: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$; *t*-value is provided in the bracket; control variables are included, but not reported in the table.

Robustness test regarding endogeneity. Given the potential problems of missing explanatory variables and reverse causality between dependent and explanatory variables, our empirical analyses might be affected by endogeneity bias. We run propensity score matching (PSM) analyses to assess the potential endogeneity bias in our study. PSM allows biases in the estimate of the treatment effect to be removed by adjusting for differences in the set of pretreatment covariates (Schilke & Lumineau, 2018). Using all control variables as pairing variables and also considering the influences from time (year) and industry, we employed three matchings of 1:1 and 1:3 neighbor matchings as well as core matching to pair every treatment firm with a firm from the control group to create a quasi-control group and randomize the data (Zaefarian, Kadile, Henneberg, & Leischnig, 2017). As shown in Table 8, the PSM analyses demonstrate that for the matched group, co-governance had a significant and positive effect on R&D intensity with coefficient values at 0.91, 0.077, and 0.070, respectively. Following the same procedure, we also tested the effects of the three moderator variables of kinship, age difference, and gender, and the results were consistent, indicating that endogeneity is not a concern for our data.

Extended robustness test: Co-governance, innovation investment, and firm performance. In order to examine the nature of co-governance, we further tested the effects of co-governance as well as R&D intensity on firm performance, respectively. We employed return on equity (ROE) and Tobin's Q as two measures of firm performance. The results from Models 17 and 19 in Table 9 demonstrate that co-governance does not significantly influence firm performance measured either by ROE or Tobin's Q. This result suggests that co-governance does not necessarily lead to improvement of firm performance, as it aims to facilitate a smooth succession of the firm from the founder generation to the second generation, indicating the supportive behavior of the founder generation to their succession generation. On the other hand, as shown by the results from Models 18 and 20, R&D intensity has a significant effect on firm performance measured either by ROE ($\beta = 0.289$, $p < 0.05$) or Tobin's Q ($\beta = 5.880$, $p < 0.01$). These results suggest that through facilitating innovation activities, co-governance can indirectly influence firm performance, although it does not directly improve firm performance.

DISCUSSION

Having emerged during the reform and opening up of the Chinese economy, Chinese family firms have experienced rapid development over the past 40 years, and many are reaching a phase of intergenerational succession. Co-governance of Chinese family firms is a common phenomenon in the intergenerational succession process. Based on altruistic behavior motivated by 'far-reaching' parental love, our study examined the innovation activities during the intergenerational succession period and identified co-governance as the mechanism to facilitate

Table 8. Results of PSM analysis for co-governance and R&D intensity

R&D intensity		1:1 matching		1:3 matching		Core matching	
		ATT	t-value	ATT	t-value	ATT	t-value
Co-governance	Unmatched	0.067**	2.02	0.067**	2.02	0.067**	2.02
	Matched	0.091*	1.73	0.077**	2.22	0.070*	1.87

Notes: ***p < 0.01, **p < 0.05, *p < 0.1.

Table 9. Co-governance, innovation activities, and firm performance

Variables	ROE Model 17	ROE Model 18	Tobin's Q Model 19	Tobin's Q Model 20
Co-governance	0.182		0.022	
	(1.16)		(0.28)	
R&D intensity		0.289**		5.880***
		2.17		2.79
Firm age	0.035	0.012	0.103	0.137
	(0.21)	(0.09)	(1.24)	(1.38)
Firm size	0.183*	0.248*	0.035***	0.032***
	(1.86)	(1.90)	(10.55)	(9.59)
Dual	−0.114	−0.098	0.010	0.060
	(−0.66)	(−0.46)	(1.13)	(0.59)
FSH	0.006	0.005	0.025	0.024
	(0.22)	(0.18)	(1.40)	(1.30)
ESH	0.026	0.019	−0.008	−0.007
	(0.89)	(0.78)	(−0.50)	(−0.49)
Indep	0.026	0.031	0.052	0.051
	(0.27)	(0.33)	(0.93)	(0.92)
Constant	0.819***	0.765***	17.142***	17.823***
	(6.68)	(6.16)	(15.13)	(11.36)
Year	Control	Control	Control	Control
Industry	Control	Control	Control	Control
Observations	4,694	4,694	4,694	4,694
Adj. R^2	0.209	0.093	0.136	0.127

Notes: ***p < 0.01, **p < 0.05, *p < 0.1; t-value is provided in the bracket.

innovation activities. Initiated by altruistic support from the founder to the successor generation, co-governance in the intergenerational succession period positively affects innovation in order to facilitate a smooth succession. Moreover, this direct link between co-governance and innovation activities is positively moderated by three factors associated with parental altruistic behavior: kinship relationship, age difference, and gender difference. More specifically, a parent–child kinship relationship, a bigger age gap between the founder and successor, and a female successor will trigger greater care and support from the founder generation, and thus enhance the positive link between co-governance and innovation activities. Moreover, a positive link between innovation activities and firm performance

during the co-governance period demonstrates the effectiveness of the founder generation's support in achieving a smooth succession. On the other hand, our results demonstrate that altruism-based co-governance leads to innovation differentiation, resulting in a flow of resources to low-risk innovations, rather than high-risk inventive innovations. This finding indicates that the altruistic support toward the successor has its limitation in stimulating innovation, as it directs innovation resources away from a more creative to more conservative innovation area.

Applying altruism as the theoretical approach to address this research gap, our study contributes to the family firm intergenerational succession literature by proposing it is the nature of founder–successor relationships underlying the succession process that has significant influence on firms' innovation activities. Based on family firms located in mature economies, prior research suggests intergenerational succession is presented as an opportunity for reaffirmation of a strategic position (Garcia et al., 2019; Gomez-Mejia et al., 2014; Miller & Le Breton-Miller, 2014). However, the strategic stability of the firm is much less likely to apply in an emerging economy like China (Zhao et al., 2020). Our results demonstrate that the founder–successor relationship is culture-bounded and more complex than previous studies have suggested. In such circumstances, leadership succession requires an alignment of the firm's strategic position with the changes both internal and external to the firm (Quigley & Hambrick, 2012).

Extending this line of research, our study examines the relationship between co-governance as a transitional type of governance structure and resource commitments to innovation of Chinese family firms. By doing so, we are the first to explicitly propose and empirically assess co-governance as a novel mechanism for the hidden link between intergenerational succession and innovation activities, and are the first to explain why family firms' intergenerational co-governance is more likely to enhance innovation activities than those without co-governance. Innovation represents a challenging strategic activity for most family firms. Although prior research has identified factors that facilitate or inhabit resource commitments of family firms to innovation, research into how intergeneration succession as a unique issue of family firms affects innovation activities remains underexplored and limited research results are conflicting (De Massis et al., 2015; Richards et al., 2019). Given their heterogeneity, family firms can follow different patterns of succession which may influence their innovation activities in different ways. Our study attempts to address the gap by empirically investigating the interplay between intergenerational succession pattern and the resource commitments to innovation activities. In line with the Chinese yin-yang philosophical perspective, we identify co-governance as a distinct intergenerational succession pattern that provides a mechanism to balance change and continuity as two conflicting strategic directions in the intergenerational succession process and thus solve the change-continuity paradox. Parental altruistic support suggests a positive relationship between co-governance and resource commitments to innovation activities for the future take-over by the intra-family successor. Our empirical findings

contribute to the literature of family firm succession and innovation by suggesting that it is the nature of co-governance underlying the founder–successor relationship, rather than intergenerational succession *per se* that has a significant effect on innovation activities as the strategic direction. As discussed below, the nature of intra-family relationships was found to influence the extent to which the founder provides parental altruistic support to the successor, which in turn affects the strength of the positive link between co-governance and innovation activities.

Prior research suggests that differences in kinship relationship and personal experiences would lead to differentiation of interests and preferences among members of the owning family, resulting in conflicts of interest and agency problems (Eddleston & Kidwell, 2012; Garcia et al., 2019; Schulze et al., 2003b; Sharma, Chrisman, & Chua, 2003; Van den Berghe & Carchon, 2003). Extending this line of research, empirical evidence from our study regarding the moderating effects suggests that parental altruistic support to the next-generation successors is contingent on the nature of the intra-family relationships between the founder and successor, which include the kinship relationship, age difference, and gender difference. That is to say, the alignment of interests among family members and the associated altruistic parent support are more likely to occur between nuclear family members and between members who share certain specific interpersonal relations. More specifically, conflicts of interest and agency problems are less likely within a parent–child relationship, with a large age difference between the incumbent and successor, and with female gender of the successor. These empirical findings demonstrate that different types of family relationships within the owning family can affect the efficiency of family firm governance by influencing strategic decision-making regarding resource commitment to innovation activities.

Previous studies suggest that intergenerational succession affects innovation of family firms, either positively (Kraiczy et al., 2015; Laforet, 2013) or negatively (Block, 2012; Gomez-Mejia et al., 2019; Miller & Le Breton-Miller, 2014). Responding to the recent call to acknowledge potential socio-emotional wealth heterogeneity within family firms (Vandekerkhof, Steijvers, Hendriks, & Voordeckers, 2018), our study proposes that succession pattern with regard to whether there is co-governance structure in the succession process is a key determinant of innovation activities in the succession process. Thus, we identify co-governance as a hidden link between intergenerational succession and innovation in Chinese family firms. Our empirical evidence demonstrates that the connection between intergenerational succession and innovation is deeper and much more complex than prior research has shown. Specifically, the nature of intra-family relationships is helpful to achieve a change-continuity balance in terms of innovation as a strategic direction. The successor may bring in the drive for strategic change to strengthen the firm's competitive advantage in line with an increasingly prosperous Chinese economy, whereas the founder can provide continuity given his/her experience of reliance on the ability to benefit from the close ties with

business partners and governmental officials (Dou & Li, 2013). This insight is theoretically important not only because we are able to demonstrate that family firms with co-governance are more heterogeneous in their innovation activities than those without co-governance: rather, its theoretical implications include the attention this heterogeneity directs toward how parental altruistic support, in addition to their overall importance and amount related to the family kinship of blood and marriage, influences the behavior pattern of Chinese family firms.

Our empirical results regarding the effect of co-governance on innovation differentiation have significant implications. These results demonstrate that while parental altruistic support and a change-continuity balance lead to increased resource commitments toward innovation activities, these resources mainly flow to the incremental type of innovations, such as patents of utility models and designs, which are useful but not fundamental to establish and improve the firm's competitiveness, rather than the more inventive type of innovations, based on a consideration of different levels of risk involved. These results suggest that parental altruistic support is likely to be emotion based, rather than rationally based, reflecting a lack of deep-mindedness of paternalistic love.

Finally, we provide managerial implications for business practitioners. First, our findings and discussion confirm the notion from existing research that the preparation of intra-family successors for leadership positions is a long process. Moreover, rather than being composed of distinct phases, the approach to succession planning in China's family firms is more akin to an apprenticeship with successors undergoing a practical experience by 'learning on the job'. Our conceptualization of co-governance highlights the importance of including a next-generation member into the upper echelons or inner circle of the firm where the successor is likely to experience significant 'on the job' learning opportunities and where she/he is likely to exhibit greater influence over strategic decision-making such as innovation, albeit under the watchful eye of the founder. Thus, family firms should prepare their successors at an early stage to help them develop and demonstrate their governing abilities sooner. Second, the moderating effects confirmed in our study suggest that family firms should strengthen their strategic thinking of the role played by intra-family relationships in intergenerational succession. Both the founder and successor should open their mind to building a good personal relationship with high mutual respect and smooth flow of communication, and be soberly aware of the importance in achieving a change-continuity balance with regard to innovation as one of the strategic directions. Early succession planning can facilitate the achievement of change-continuity balance, so that the family firm can more effectively adapt to the dramatic changes in the business environment with inclusion of new initiatives and skills from the successor while preserving strategic stability by benefitting from the experience and social relationship capital from the founder generation. Third, the detrimental effect of emotion-based parental altruistic support on long-term sustainable competitiveness of the firm warrants managerial attention. Controllers/managers of Chinese family

firms need to be aware of the shortcomings of emotion-based paternalistic love and be mindful regarding paternalism-motivated parental support of the successor so that founder–successor co-governance can result in the 'co-creation' of sustainable competitiveness of the firm.

Limitations and Future Research Directions

Our study also has several limitations, which suggest directions for future research. First, co-governance can be a long process and its potential influence on the strategic behavior of the firm may not be felt for several years. Given the relatively short timeframe of the emergence of family firms in the Chinese economy, a majority of Chinese family firms have not yet started nor completed the intergenerational succession from the founder to the successor. As shown in Table 1, only a small proportion of the firms included in our full sample have experienced a co-governance period. The influence of co-governance on strategic behavior of the firm may take a long time to fully appear. Thus, access to longer-term sample data could be helpful. Second, the phased succession that our study has documented may not fully capture the lasting impact of founders on strategic behavior of the firm. We measured co-governance by the two time points of (1) entry of the successor to the TMT and (2) departure of the founder from the position of either chair of the board or the CEO. However, a founder could still play an influential role in firm governance in terms of its strategic behavior after they leave the top positions of the firm, even if they do not have an official title in the firm, especially in the context of Chinese society. This lasting impact of the founder needs to be included in future studies of intergenerational succession.

NOTES

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