The bright and dark sides of institutional intermediaries: industry associations and small-firm innovation

Abstract: Institutional intermediaries are often seen by governments as avenues for increasing firm level innovativeness. This is because they can provide both information and legitimacy, which enable access to government support. Yet, close engagement with intermediaries may also encourage political intervention, especially in the context of emerging markets. Using a unique dataset which consists of the Chinese Micro- and Small-Enterprise Survey (CMES) and the National Economic Research Institute (NERI), we explore the roles of government support and political intervention in the relationship between institutional linkages and firm innovativeness. We find that government support, in the form of tax benefits, and political intervention mediate the relationship between institutional linkages and firm innovativeness. We also find that this relationship is contingent upon the degree of institutional development within which firms operate. Our findings therefore contribute to the burgeoning literature that examines the effects of institutional intermediaries on innovation by exploring both their bright and dark sides. We discuss the implications of these findings for institutional intermediary research, institutional theory and innovation literature and offer advice to policymakers and managers looking at improving innovativeness.

Keywords: institutional intermediary, institutional linkages, industry association, institutional development, tax benefits, political intervention

1 Introduction

Institutional intermediaries are third-party agents that link disparate entities and help to develop rules or norms that can structure participating actors' interactions (Dutt et al., 2016; McDermott, Corredoira, & Kruse, 2009). They are often seen by governments in emerging markets as avenues for increasing firm-level innovativeness. As such, they can contribute to the development of regional ecosystems and foster innovation by enabling collaboration and facilitating the communication and implementation of policy (Goswami, Mitchell, & Bhagavatula, 2018). Furthermore, such intermediaries can also help forge links between the isolated networks in which firms often operate (Clayton, Feldman, & Lowe, 2018; Zhang & Li, 2010). As a result, there has been a significant increase in the policy and scholarly attention paid to both their structure and their effectiveness (Armanios, Eesley, Li, & Eisenhardt, 2017; Watkins, Papaioannou, Mugwagwa, & Kale, 2015).

Given the rise of emerging economies such as China, scholars of institutional intermediaries have shown a burgeoning interest in understanding how they can increase a firm's innovativeness (Howells, 2006; McDermott et al., 2009). They have approached this by focusing on how they fill institutional voids (Dutt et al., 2016; Mair, Marti, & Ventresca, 2012), how they trigger institutional reconfigurations (Oriaifo, Torres de Oliveira, & Ellis, 2020), and how they give support to entrepreneurs (Armanios et al., 2017; Clayton et al., 2018). Much of this literature suggests that a firm's association with institutional intermediaries, a notion we refer to as "institutional linkages" (Baum & Oliver, 1991; Lawrence, 1999), signals that it conforms to the norms and expectations of its institutional environment; in other words, such institutional linkages signal that the firm is legitimate. Such legitimacy increases the firm's credibility and social acceptance and thus potentially unlocks resources, such as investment funds and loans, which increase the intensity of its innovation efforts and thus its level of innovativeness (Khaire, 2010; Meyer & Rowan, 1977).

Although institutional linkages can support a firm's innovativeness through increased legitimacy, they may also reduce its autonomy and flexibility. First, such linkages may invite external intervention (Marchington, 2015; Pfeffer, 1976) especially when the intermediary is representative of a few "core" firms (Sine, Haveman, & Tolbert, 2005; Watkins et al., 2015). Such intervention may be deemed necessary to acquire membership of an association. Second, pressure to achieve institutional linkages may impose conflicting demands and blur a firm's strategy (Eberhart & Eesley, 2018; Greenwood, Raynard, Kodeih, Micelotta, & Lounsbury, 2011; Oriaifo et al., 2020). As a result, institutional linkages may reduce autonomy and flexibility and thus constrain a firm's ability to experiment and innovate.

Depending on the context, therefore, institutional linkages can have either a positive or a negative effect on innovativeness. However, within the institutional intermediary research, relatively little attention has been paid to empirical examination of the factors that may help reconcile these conflicting effects (Clayton et al., 2018; Watkins et al., 2015). The absence of such a theoretical understanding is of concern. Governments, especially those of emerging markets, increasingly support and intervene in institutional intermediaries (Clayton et al., 2018), often through the use of taxation policies, in the hope that this will increase the innovativeness of private firms and lead to growth (Armanios et al., 2017; Watkins et al., 2015). A limited understanding of the theoretical mechanisms that lead to innovativeness would mean that such intervention was arbitrary and could actually bring about the opposite result (Ahuja & Yayavaram, 2011).

We aim to fill this gap in the literature by exploring the role of government support and political intervention in the relationship between institutional linkages and firm innovativeness. Our main argument is that a firm's innovativeness will depend on both the government support (which we operationalize as tax benefits) it receives and the political intervention it will have to accept. Both of these will be determined by the practices and

procedures advocated by the institutional intermediaries. We argue, therefore, that government support and political intervention mediate the relationship between institutional linkages and firm innovativeness.

Institutional intermediaries enable member firms to access government support by generating official certifications that enhance their legitimacy (Armanios et al., 2017; Sine, David, & Mitsuhashi, 2007) and by providing policy information that may not be easily accessible outside the system (Howells, 2006; Liu, 2020). However, legitimacy also requires that firms conform to the norms and expectations set by the institutional intermediaries, that may be tied to local political interests (Jia, 2014; Sine et al., 2005; Suchman, 1995). Such intervention likely reduces managerial autonomy, makes resource allocation less efficient (Meyer & Rowan, 1977), and increases the likelihood of missing technological opportunities (Nee, 1992; Zhou, Gao, & Zhao, 2017).

Furthermore, since institutional linkages mean relationships with government agencies that are profoundly shaped by environmental factors, we would expect them to be contingent upon the institutional development, i.e., the degree to which economic activity is coordinated by the market within which firms operate and not by a central planning agency (Khanna & Palepu, 2000a; Meyer & Nguyen, 2005). According to an institutional-transition view (Peng, 2003; Webb, Tihanyi, Ireland, & Sirmon, 2009), when macro institutions strongly support market mechanisms, the political aspect of institutional intermediaries should have less influence on firms in terms of both tax benefits and political intervention.

We test our ideas by studying small firms' "membership" behavior in industry associations in China. These associations are institutional intermediaries that aim at bridging the gap between business and government (Deng & Kennedy, 2010; Watkins et al., 2015). This context provides an ideal empirical setting in which to test our theoretical framework, for the following three reasons. First, small businesses play an important part in increasing market

innovativeness and stimulating economic creativity (Verhees & Meulenberg, 2004), but in China they also face pressure as a result of high taxation (Zhu, Wittmann, & Peng, 2012). Government support in the form of tax breaks or subsidized credit programs is important to these firms and therefore incentivizes them to join associations to access it. Second, as governmental agencies, associations are linked to local government bodies or are affiliated with quasi-governmental organizations (Deng & Kennedy, 2010; Kennedy, 2005). These associations are likely to speak on behalf of, and develop favorable rules for, only a few interest groups, namely businesses that are in the interests of central players in the association (Sine et al., 2005). Third, the state is still undergoing marketization reforms and regional markets are not developing uniformly, resulting in environments that are characterized by different levels of institutional development (Peng, 2003). Such institutional heterogeneity makes it possible to delineate the theoretical boundaries of the effectiveness of institutional linkages in terms of firm innovativeness.

1.1 Institutional background: industry associations as institutional intermediaries in China

Industry associations, which constitute an important but underexplored form of institutional intermediaries within emerging markets, are "member-based organizations that represent the interests of a particular industry and actively lobby and negotiate with government on their member's [*sic*] behalf to shape government policy and regulation" (Watkins et al., 2015: 1408). They have existed for a long time in both western and eastern societies, with prominent examples including trade associations in the US (Sine et al., 2005) and industry associations in China (Deng & Kennedy, 2010). They play an important role in aggregating business issues and bringing them to the attention of policymakers, and as such possess a political dimension. However, academic attention has not generally focused on the

political facets of industry associations, and scholars have called for research into how they operate in emerging markets like China (e.g., Watkins et al., 2015).

In China, the central and local government determine infrastructure spending and resource allocation in the form of bank loans, subsidies, and tax breaks. However, policy preferences and favorable terms are more likely to be secured by state-owned enterprises, because these are often seen as the lifeblood of the national economy (Peng & Luo, 2000; Zhou et al., 2017). Against this background, building linkages with government agencies by becoming a member of industry associations can be a more practical approach for private enterprises seeking to access public resources (Watkins et al., 2015; Xin & Pearce, 1996). In contrast to a strategy of pursuing political connections, which would aim for direct contact with government officials (e.g., Li & Zhang, 2007), institutional linkages rely on third-party agencies as intermediaries to create a formal, rule-based link with government.

Most industry associations in China are organized by the government or are governed by quasi-governmental organizations (Deng & Kennedy, 2010). The most prominent of these is the All-China Federation of Industry and Commerce (ACFIC). ACFIC is affiliated with the National People's Congress (China's top legislative body) and represents the interests of private industrial and commercial businesses. As a governmental agency, ACFIC's main task is to manage the private economy by coordinating communication between the government and private businesses (Kennedy, 2005). To this end, it regularly participates in the National People's Congress and the People's Consultative Conference (a national-level decision-making authority) to discuss policy issues related to the private sector (Jia, 2014; Oi, 1995). ACFIC can propose tax reduction bills to Congress to encourage technology transfer, mitigate asset depreciation, and enable resource and land use for private businesses. The structure of ACFIC mirrors that of China's economy, which is characterized by a combination of centralized authority and local decentralization. As a result, ACFIC is headquartered in the

capital and has many provincial subassociations across the country. Given that these associations make it easier for firms to access public resources, joining them is an important tool (Lawrence, 1999); this is particularly so for small firms, whose managers typically lack the access necessary to build personal relationships (known as *guanxi* in Chinese) with government officials (Cook & Barry, 1993; Xin & Pearce, 1996).

Despite their relative lack of access to government resources, small businesses make a substantial effort to engage in innovation and patenting activities (Verhees & Meulenberg, 2004). For instance, in China in 2018, micro-, small-, and medium-sized enterprises generated more than 60% of the country's GDP, more than 70% of its invention patents, and 80% of new products (*Small- and Micro-enterprises Financial Service Report*, 2019). Small businesses' innovation potential can be further materialized by accessing more institutional support, such as tax breaks and R&D subsidies (Zhu et al., 2012).

Although associations can provide a channel to access these public resources, they also risk exerting administrative influence. For example, Chinese associations are typically affiliated with regional quasi-governmental organizations that are tasked with regulating the private sector. Regulations stipulate that every association must set up at least one Communist Party group (Foster, 2002). Yu (2006) indicates that about 47.7% of industry-association leaders are appointed by local government or delegated by ministries. Associations are therefore likely to be bound by local political interests and required to speak up for those entrenched interests when regulating the sector (Sine et al., 2005; Watkins et al., 2015).

2 Theory and Hypotheses

Our core argument is that small firms' innovation is shaped by institutional intermediaries through both government support and political intervention, and that this is contingent upon the development of the institutional environment within which they operate (our conceptual

model is depicted in Figure 1). In this section, we develop this argument in more detail and provide four hypotheses predicting the relationships between institutional linkages and firm innovativeness.

<Figure 1 Here>

2.1 Government support: The bright side of institutional linkages

We draw upon the institutional intermediary literature and focus on tax benefits as the main government support mechanism. Tax benefits, which include subsidies and breaks, are a form of support designed and formulated by the government to assist firms that meet certain political or economic requirements (Haley & Haley, 2013). We argue that there are two roles industry associations can perform to help firms gain such government support; certification support (Armanios et al., 2017; Sine et al., 2007) and information provision (Howells, 2006; Liu, 2020). The former increases a firm's credibility afforded by intermediaries, while the latter decreases information asymmetry between the firm and local government.

First, industry associations, as public agencies, benefit from social acceptance and administrative or legislative authority. Building a formal connection and maintaining a close relationship with them represents a legitimation process whereby firms that are certified are seen as credible and reliable within their environment (Baum & Oliver, 1991; Khaire, 2010; Sine et al., 2007). Such a certification process requires a series of process changes that lead to the firm conforming to the norms and expectations set by the intermediaries, adhering to their rules, and adopting their practices (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Zott and Huy (2007) point to the symbolic value of such changes and argue that by doing so, firms demonstrate their appropriateness and fitness in relation to the system and are thus more likely to be recognized and supported by the government (also see Khaire, 2010). For example, a power generation venture with a certification from the Federal Energy Regulatory

Commission of the US is more likely to acquire the resources necessary to accelerate its transition from the planning to the operational stage (Sine et al., 2007).

Furthermore, Armanios et al. (2017), who explored the effect of science parks on entrepreneurial activity in China, found that certification (which in their case related to being selected to be a member of a science park) is particularly useful for legitimizing entrepreneurs who have adequate abilities but are unfamiliar with the local norms and business practices. Evidently, entrepreneurial firms certified by science parks are more likely to gain government funding because it signals credibility and confers legitimate status within the political system. Therefore, although being a member of an association would not in itself guarantee tax benefits,[1] association-tied firms are more likely to benefit from government support.

The second role played by intermediaries in relation to providing access to tax benefits is the provision of policy information. Research suggests that due to their quasi-governmental status (Deng & Kennedy, 2010; Jia, 2014), intermediaries not only facilitate information flow (Howells, 2006; Zhang & Li, 2010), but also disseminate official policies to industry sectors and clarify any ambiguities (Liu, 2020; Watkins et al., 2015). For example, Lee (2011) observes that associations in Massachusetts act on behalf of the state government to reduce water pollution by directing Korean-American dry cleaners to enhance their environmental compliance; they do so by informing them of dry-cleaning standards and relevant legal requirements. Similarly, associations in China help local government by publicizing and clarifying tax policies for private businesses. This is important because policies issued by central government may be ambiguous when implemented at the local level (Kostka & Hobbs, 2012; Liu, Tang, Zhan, & Lo, 2018). Private businesses, especially small firms, often

[1] It is worth mentioning that membership of an association is voluntary and thus does not necessarily reflect firm quality. Associations help member firms apply for/obtain tax breaks but do not guarantee these benefits. As a comparison, some intermediaries such as science parks have qualification requirements and entrepreneurial firms that are able to enter them may automatically secure government support as a result (Armanios & Eesley, 2021).

find it difficult to track the latest tax policies because of a lack of resources (Zhu et al., 2012). Associations can help interpret such policies and reduce information asymmetry by bridging the link between firms and policymakers (Liu, 2020; Watkins et al., 2015).

In addition, the provision of information may also benefit firms by enhancing their ability to apply for policy support (Liu, 2020). Associations often have a more thorough understanding of both the application procedures and the government's priorities (Deng & Kennedy, 2010; Wilts & Meyer, 2005). As Wilts and Meyer (2005) contend, maintaining membership is an effective way of acquiring up-to-date policy knowledge. Although associations are often encouraged to do this for nonmembers as well, most of the approaches they take to keeping businesses informed are member specific, such as seminars or short training courses (Foster, 2002). Such channels enable member firms to access first-hand information about the latest and prospective tax policies, apply for tax benefits, and develop strategies that are in line with the government's ambitions. Taken together, by generating "qualified-for-subsidy" certifications and providing tax policy information, associations make it easier for firms to obtain tax benefits.

Amongst the institutional factors hindering the development of small firms in China, the tax burden is listed as one of the most significant (Zhu et al., 2012). Tax benefits have therefore become crucial for firm innovation. Economic and managerial research suggests that excessive taxation discourages firms from engaging enthusiastically in R&D activities, thus decreasing innovation output (e.g., Czarnitzki, Hanel, & Rosa, 2011; Mukherjee, Singh, & Žaldokas, 2017). Zhu et al. (2012), for instance, interviewed 82 small-firm managers in China, and found that about 95% of interviewees suffered from excessive taxation. They concluded that China's tax system discourages innovation. This is because most taxes are "value added," meaning that more innovation output leads to more tax being paid. Conversely, a lower tax ratio can promote innovation in small businesses because tax credit

policies raise the threshold of value added tax. Such reductions give firms more financial headroom for R&D activities, enabling them to explore new spheres and tolerate higher risks (Bronzini & Piselli, 2016; Czarnitzki et al., 2011).

To summarize, we argue that seeking government support can be a significant motivation for firms to pursue legitimacy through membership of an association. Furthermore, government support, in the form of tax benefits, can be a significant enabler of firm innovativeness, particularly in the Chinese context. Therefore, tax benefits should mediate the effect of institutional linkages on firm innovativeness. This leads to our first hypothesis:

Hypothesis 1 (H1): Tax benefits will positively mediate the relationship between institutional linkages and firm innovativeness in such a way that institutional linkages can indirectly promote firm innovativeness through obtaining more tax benefits.

2.2 Political intervention: The dark side of institutional linkages

Institutional linkages are not without constraints. Institutional theory suggests that legitimacy is obtained through firms' conformity to the rules, values, and norms of the political system (Scott, 1995; Suchman, 1995). Yet, accessing political resources and interacting with authorities to achieve legitimacy makes political intervention inevitable (Frynas, Mellahi, & Pigman, 2006; Pfeffer, 1976). This may come in the form of direct interference by administrative or government departments in matters that can affect a firm's business affairs, such as inspection, training, and changes in the appropriability regime (Li & Zhang, 2007). Efforts to achieve legitimacy, therefore, may invite arbitrary intervention that could limit firms' autonomy and flexibility (Meyer & Rowan, 1977; Pfeffer, 1976) and thus constrain their ability to experiment and innovate (Ahuja & Yayavaram, 2011).

Furthermore, the operation of associations may generate some inherent biases that could affect firm innovativeness. First, associations need to take action to maintain their own status. This includes meeting government requirements and attracting representative firms to be

members. While membership is voluntary, local government usually encourages associations to seek out those firms that can be seen to represent the interests of the wider group. The assumption is that these firms will be able to foster the creation of rules which will both enable the growth of the industry and support government policy (Kennedy, 2005; Sine et al., 2005). Yet, the potential departure of any of these key members will undoubtedly decrease the associations' legitimacy.

Second, associations usually operate by charging membership fees (Deng & Kennedy, 2010). Losing key members could result in loss of income. There is therefore a significant risk of inherent bias in representing the views of a smaller number of key firms. Sine et al. (2005: 212), for instance, contend that trade associations in the US are special interest groups "dominated by a particular segment of the membership." Similarly, Watkins et al. (2015: 1409) claim that associations exert regulatory intervention and do so in such a way that "[associations] pursue narrow rents for a limited number of members at the expense of the wider sector and economy." In so doing, association rules tend to be designed to attract and promote these firms. For example, to enhance their reputation, associations may encourage or require member firms to donate. They may admit that the donation quota is designed to meet the standards of a minority of entrenched interests and politically connected firms at the cost of others (Zhang, Marquis, & Qiao, 2016).

Due to the quasi-governmental nature of industry associations, intervention may also be influenced by political aspirations (Deng & Kennedy, 2010; Jia, 2014), since they are connected with local party groups and government departments (Foster, 2002). Given their influence and closeness to the business sector, local ministries may also be interested in coordinating associations' affairs (Jia, 2014). Associations may attempt to achieve their regulatory goals by instilling norms, rules, and cultures in member firms (Armanios & Eesley, 2021; Zilber, 2002). Moreover, established firms usually dominate industry associations and

thus contribute significantly to the formation and development of the associations' institutions (Sine et al., 2005). These core firms may find it easier to steer associations and policymakers according to their own interests. Accordingly, associations are likely to intervene politically to protect entrenched interests, or may even allow some firms to reap benefits (such as preferential regulations or industry standards) to the detriment of others when their interests are under threat.

In the face of such political intervention, managers will have to apply considerable energy and attention to managing their innovation activities. When firms consume resources that should have been devoted to productive activities to deal with such issues, they are likely to lose strategic impetus. Nee (1992), for instance, shows that with bureaucratic intervention, firms are constrained in their market behavior and become limited in their ability to set wages, invest capital, and control product pricing. Over time, such constraints may make organizational routines rigid, eventually eroding their ability to be innovative and to achieve economies of scale (Ahuja & Yayavaram, 2011).

Therefore, we propose that when firms join associations, they are likely to suffer political intervention which in turn hurts firm innovativeness:

Hypothesis 2 (H2): Political intervention will negatively mediate the relationship between institutional linkages and firm innovativeness in such a way that institutional linkages can indirectly impede firms' innovativeness by making them subject to more political intervention.

2.3 Contextual contingency: degree of institutional development

So far, in the development of our theoretical framework, we have focused on the effect of intermediary linkages on firm behavior and innovativeness. Yet, this relationship is very likely to be contingent upon the context within which intermediaries and firms operate (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Given that the role of intermediaries is to bridge the gap between firms and the government (Deng & Kennedy, 2010; Watkins et al.,

2015) one key contextual factor that affects both the amount of government support and the nature of political intervention is institutional development. For instance, when institutions are developed, the rules are well understood by all stakeholders (Schipani & Liu, 2002) and thus the role of intermediaries as policy information providers fades (Khanna & Palepu, 2000a; Zhang & Li, 2010). At the opposite end, when institutions are not fully developed and government rules are still adapting, the role of associations in providing policy information and lobbying the government on members' behalf becomes critical. There is, therefore, a good theoretical reason to expect that institutional development will moderate the relationships between intermediary linkages and both government support and political intervention.

We posit that when institutions are well developed, the institutional role of industry associations in providing government support and intervening in the private sector should decline.

When institutions are formalized, government policies will be implemented more rigorously in order to promote fairness (Peng, 2003; Schipani & Liu, 2002). For instance, when more effective and stricter laws are developed, government support and tax policies are strictly governed by the authorities (Peng & Luo, 2000). In such a context, associations will be less able to use their "quasi-governmental identity" to find non-publicly available information for their member firms. As Khanna and Palepu (2000b) show, business groups are less effective at creating value for members when the institutional environment is more developed. This view is also implied by Zhou et al. (2017), who believe that the Chinese government's partiality in allocating resources to state-owned enterprises will decrease as an institution develops.

Furthermore, when institutions are more developed, the information used to govern the relationship between the state and businesses becomes more transparent. In more developed

regions, governments allow the market to govern business activities but also ensure that policy information is widely known and disseminated (Khanna & Palepu, 2000a; Sheng, Zhou, & Li, 2011; Zhou et al., 2017). When information flows more systematically across the market, policy-related information can be accessed without excessive cost and non-association-tied firms can easily gain access to it. In addition, as institutions develop, more diverse market intermediaries will be founded that will help businesses to better understand how to navigate government policies and regulation (Dutt et al., 2016; Mair et al., 2012). As a result, a greater number of firms will be able to build connections with intermediaries and benefit from their services. In this way, the difference between association-tied and non-association-tied firms in terms of obtaining government support, decreases.

For these reasons, we propose that when institutions are more developed, there will be a decrease in the amount of government support facilitated by institutional intermediaries on behalf of their member firms.

Hypothesis 3 (H3): The positive effect of institutional linkages on tax benefits will be reduced for firms located in better-developed institutional environments.

The degree of institutional development should also affect the relationship between institutional linkages and political influence. As we explained in the development of the previous hypothesis, a low degree of institutional development means that the government still exerts strong control over the market. This would suggest that the boundaries within which government officials can act are not clearly defined. In such contexts, therefore, it would be reasonable to expect a higher level of political intervention from institutional intermediaries.

When institutions are more developed and thus more formalized, the rules will be clearer. As Peng (2003) explains, when economies liberalize and institutions develop, rule-based

transactions begin to replace relationship-based ones. In such a context, political intervention will be regulated and, in some instances, explicitly prohibited. As a result, the cost and risk of intervening in a single business's affairs will be higher for both local politicians and association leaders.

Parallel to the increase in the risk and cost of intervening, when institutions are more developed there will be more pressure on associations to be representative of their wider members' interests. Governments and regulatory bodies are more likely to take into account views expressed by the associations that are known to represent all their members' interests and challenges. This is likely to result in the introduction of fairer rules and standardized membership regulations that apply to everyone and not only to few core firms (Dutt et al., 2016). Although such rules would not necessarily make institutional intermediaries less or more powerful, they do ensure greater transparency and representativeness, which should result in less direct political intervention.

For these reasons, we propose:

Hypothesis 4 (H4): The positive effect of institutional linkages on political intervention will be reduced for firms located in better-developed institutional environments.

3 Empirical Context

We gathered both qualitative and quantitative information to understand how industry associations affect small businesses in practice. We interviewed six membership-holding managers from three industries that actively pursue innovation (two from each industry): software and information-technology, communications and data transmission, and pharmaceutical manufacturing. We also interviewed three managers from the same three

industries who worked in companies that are not members of any associations.[2] The three industries are typical of our later quantitative analysis. These interviews offered insights that helped inform our hypotheses.

The first role associations play in easing the path to tax benefits is certification. In our interviews, a software industry manager who holds a Double Soft Certification (DSC), which is a certification granted by that industry association, noted that "It can be said that obtaining DSC is the biggest motivation for us to join the association. This certification was previously issued by governmental departments, but now becomes a responsibility of associations." With such certifications, firms are perceived to be desirable and credible within the political setting. As the manager added, "It [DSC] represents an official accreditation, and we can enjoy preferential policies with it." According to this manager and to official regulations,[3] DSC certificates affirm that a firm's products are trustworthy and socially acceptable, and they last for five years. The firm thus is exempt from 100% of income tax in the first two years, and 50% in each of the following three years. As a comparison, the three interviewees from nonmembership-holding companies did not mention certifications.

In addition to obtaining enhanced credibility through certifications, associations also help firms to become aware of policy information. As one manager noted, "I regularly receive their [the associations'] messages about the latest tax policies." The other managers from membership-holding companies added that joining an association enables them to communicate directly with the association's officers, and thus to avoid missing information

[2] To obtain greater detail on this, we contacted a business research company in Shanghai to obtain a list of small firms. We selected membership-holding firms and their equivalents according to firm age, industry category, and firm size. With the assistance of the research company, we conducted online interviews with managers through WeChat. Of the nine interviewees, five were owners/founders and CEOs (general managers) and four were managers but not owners. Before the interviews, we outlined topics and questions, focusing mainly on the reasons for and consequences of obtaining membership (or not). Each interview took around 30 to 70 minutes.

[3] For more details of governmental policies, see: http://www.gov.cn/zwgk/2011-02/09/content_1800432.htm.

about government policies about innovation subsidies. A two-sample test of our quantitative data shows a significant difference in managers' perceptions of the sources of tax policy information (which include governmental departments, media, industry associations, consultancy companies, and various other sources), with 28.73% of membership-holding managers believing that industry associations are the main source, compared to 7.58% of those in companies not holding membership.

H2 implies that associations may act as representatives for local interest groups and favor more established firms over peripheral ones. Our interviews with communication-industry managers were consistent with this view and indicated that associations tend to promote elite firms over others by intentionally creating favorable regulations. A key complaint of interviewees was the subject of membership classes, namely that members are classified into "permanent," "board," and "common." One manager we spoke to, who was in the "common" class, stated that "Obviously, they [permanent and board members] have more power than we do to influence the administration of association affairs and the setting of industry standards." The political implications of small-firms' intervention were also indirectly confirmed by this manager, who suggested that permanent membership is awarded to qualified firms, typically "star" firms that contribute significantly to local economic growth or that have government as one of their shareholders. Similarly, one nonmembership-holding manager suggested that this classification system was the main reason he had refused to join associations. "I heard permanent members enjoy VIP treatments and they [leaders of associations] always stand on the side of these firms. I do not see any sense in small businesses like mine joining associations."

3.1 Sample and quantitative data

To test our hypotheses, we used data from the following sources: the Chinese Micro- and Small- Enterprise Survey (CMES), the National Economic Research Institute (NERI), and

other archival materials. The primary data source, CMES, was a project conducted by the Research Centre of China Household Finance in 2015. In line with the aims of the paper which focuses primarily on small firms, we chose small- and micro- enterprises (SMEs) as the research sample. Due to the resource limitations of small firms, the benefits and costs they incur for bridging activities will be more readily observable (Baum & Oliver, 1991; Bronzini & Piselli, 2016). SMEs were manually identified according to the *Provisions on Classification of Medium, Small and Miniature Enterprises* (issued by the National Development and Reform Commission, and the Ministry of Industry and Information Technology in 2011).[4] The research team first generated a random nationwide sample of SMEs using multistage stratified sampling across more than 80 counties from all provinces or cities (excluding Hong Kong, Macao, Taiwan, Tibet, Xinjiang, and Qinghai). The data were then collected through direct interviews with the majority owner or CEO (general manager) of each firm. The firms are not identified by name due to confidentiality agreements. The survey reports information about SMEs in 2014, mainly in the areas of firm innovation, accounting, human resources, and several other aspects related to leadership, with a full sample covering 20 industry categories. Since some industries that do not engage heavily in innovation (e.g., the retail and catering industries) are underrepresented in our sample, we narrowed our regression analyses to three industries: software and information-technology, communications and data transmission, and manufacturing. This generated a more balanced sample in terms of firms' innovativeness. These three industries (of all 20 industry categories) were responsible for around 67% of the firms that patented in our sample.

[4] According to the Provisions, the classification standard of SMEs is regulated on the basis of the number of employees, revenue, total assets, and industry type. For example, for the retail sector, enterprises with less than fifty employees or with business revenue lower than one million yuan (about 142,600 dollars) were classified as SMEs; for the construction sector, enterprises with a business revenue of less than 60 million yuan (about 8,561,100 dollars), and with total assets lower than 50 million yuan (about 7,134,300 dollars) were classified as SMEs. For details, please see the *Provisions on Classification of Medium, Small and Miniature Enterprises* (2011).

Additional provincial-level data (i.e., institutional information) were obtained from the NERI index of institutional development (Wang, Fan, & Yu, 2017). To evaluate China's marketization process and regional development, NERI compiles a composite yearly index to comprehensively measure the degree of institutional development at the provincial level. Evaluating regional institutions at the provincial level is appropriate because this is where fiscal decentralization is implemented, allowing provincial government to become the unit of economic reform and market development (Oi, 1995; Peng, 2003).

3.2 Variables

3.2.1 Dependent and independent variables

Innovativeness relates to a firm's ability to introduce new products or services (Ruvio, Shoham, Vigoda-Gadot, & Schwabsky, 2014). We used the success or failure of patenting as a proxy to determine the extent of firms' innovativeness (Ahuja & Katila, 2001). Despite debates about measuring innovativeness, patenting behavior has been regarded as a well-established and validated indicator of innovation in R&D activities (Griliches, 1998; Katila, 2002; Pavitt, 1982). It measures accurately the activeness and timeliness of firms' innovation and thus it is an appropriate metric. We generated a variable that was coded 0 for firms that have no patents been granted and 1 for firms that have successfully been granted at least one patent.[5]

The independent variable, institutional linkages, was measured by a dummy variable, which was coded as 1 for firms that are members of an industry association and 0 for those that are not.[6]

[5] The survey collected no information about the number of patents. This measurement could be inaccurate for large firms because they may see great variances in patent numbers from one year to the next. However, for small firms, which are the focus of this study, there is less concern about this because the number of patents that most small firms can obtain annually is relatively small (*Small- and Micro-enterprises Financial Service Report*, 2019).

[6] The CMES does not include information about industry association types, e.g., ACFIC.

3.2.2 Mediating variables

The first mediating variable is tax benefits. To obtain these, firms need to apply to governmental departments.[7] We measured tax benefits using firm owners' response to an item asking whether or not their firm had received tax breaks on R&D activities in the past year. A dummy variable was constructed which took the value of 1 for Yes and 0 for No.

To measure whether a firm had experienced political intervention, we used the owners' responses to items related to donation, political inspection, apportionment, compulsory sponsoring, training, and orders from administrative or relevant departments. This measure is analogous to others used in studies that aim to capture the effects of political interventions in competitive markets (Li & Atuahene-Gima, 2001; Li & Zhang, 2007). The variable took the value of 1 when owners reported that they had experienced at least one of these issues, and 0 when they did not. Given the weakness of the data, we cannot distinguish the strength of the political intervention for each item. However, a yes or no style question can help to avoid lapses in memory, since it decreases the requirement for statistical accuracy and increases managers' willingness to respond to questions about political issues.

3.3.3 Moderating variable

We used marketization information from the NERI index to measure the institutional development variable (see for instance Jia, 2014; Zhou et al., 2017 for more detailed explanation). The index is a composite indicator that consists of several sub-indices, including the relationship between government and market, the development of the non-state economy, the development of product and factor markets, the development of market intermediaries,

[7] These tax breaks can be regarded as being implemented by local government. According to Chinese law, central government is the legislative authority on tax policies while provincial government is the implementation unit of such policies. The latter has some flexibility in adjusting and initiating preferential quotas and tax-related fees according to local economic needs. For more detail, see *Enterprise Income Tax Law of the People's Republic of China (2007)*.

and the legal environment. The higher the value, the greater the degree to which market mechanisms dominate economic activities.

3.3.4 Control variables

We mainly controlled for variables that may affect firm innovativeness. First, we controlled for firm size using the logarithmic transformation of total assets. We also controlled for firm age and profitability. Firm age was calculated based on the firm's registration year, while firm profitability was an ordinal variable coded as follows: 1 = profit decreases; 2 = profit is stable, and 3 = profit increases. Second, the managers of small firms are typically also their owners, and so their personal networks may exert a powerful impact on business performance (Peng & Luo, 2000). To address this, we controlled for political experience, which measured whether or not owners had ever worked in governmental or administrative departments, and business ties, which reflects whether owners have jobs at other companies. Third, we controlled for employee numbers (logarithmic transformation of number of employees), R&D intensity (logarithmic transformation of R&D expenditure), and employee learning (an item indicating the extent to which firms pay attention to employees' learning ability, with responses collected using a six-point Likert scale). These variables may reflect the firm's R&D investment or technological orientation. Finally, we constructed industry and province dummies to address potential industrial and provincial heterogeneity.

4 Analysis and Results

Table 1 presents the main variables used in the analysis. Multicollinearity is not a significant concern as all variance of inflation factors are smaller than 2 (Hair, Black, Babin, Anderson, & Tatham, 1998). To test the mediation hypotheses, we used the procedure set out by Baron and Kenny (1986) and Sobel's (1982) test, as well as bootstrapping techniques for estimating indirect effects (Hayes, 2009). We employed logistic regressions to deal with the

discrete nature of the patenting success, tax benefits, and political intervention variables (Hilbe, 2009). Table 2 reports the main results for our hypotheses.

<Table 1 Here>

To test H1, which predicts the mediating role of tax benefits in the relationship between institutional linkages and firm innovativeness, we first estimated the results for the effect of such linkages on tax breaks and patenting success. In Table 2, Models 1 and 5 show that the linkages have positive effects on tax breaks (β=0.587; p<0.05) and patenting success (β=0.515; p<0.05). This indicates that the total ("net") effect of institutional linkages on firm innovativeness is positive and significant.[8] Next, we introduced the tax break variable. According to Baron and Kenny (1986), and on the basis of Model 5, if a variable that has been introduced is found to be significant and, at the same time, the significance of the former variable (the independent variable) is reduced, the mediation hypothesis is supported. This is the case here, as can be seen from Model 6. The tax break variable is highly significant and positive for patenting success (β=1.525; p<0.01), and a closer look reveals that the inclusion of the tax break variable reduces the significance of institutional linkages from p=0.022 (Model 5) to p=0.066 (Model 6).

H2 posits that institutional intervention negatively mediates the relationship between institutional linkages and patenting performance. We modelled the same procedures as conducted in testing H1. Table 2 contains the results, suggesting a significantly positive effect

[8] Although our theoretical framework primarily concerns and applies to the benefits and costs of institutional linkages (rather than their final outcomes), to ensure the analysis was comprehensive we also tested the moderating role of institutional development in relation to the total effect. Results (Model 8 in Table 2) indicate that the positive effect of institutional linkages on firm innovativeness is weakened for firms located in better environments. This finding is consistent with the business group literature (Khanna & Palepu, 2000b). We also ran a model without the interaction (Model 8 without the interaction of institutional linkages and institutional environment), and results remain substantively unchanged (available upon request).

of institutional linkages on political intervention (β=0.617; $p<0.01$ – see Model 3) and a significantly negative effect on patenting performance (β=-0.579; $p<0.05$ – see Model 7). The addition of political intervention changes the significance of institutional linkages from $p=0.022$ (Model 5) to $p=0.01$ (Model 7).

<Table 2 Here>

To directly gauge whether the indirect effects are significant, we also conducted the Sobel test (Sobel, 1982) and the bias-corrected bootstrapping mediation approach (Hayes, 2009; MacKinnon, Fairchild, & Fritz, 2007; Zhao, Lynch Jr, & Chen, 2010). Bootstrapping is an approach performed based on Monte Carlo sampling with replications (a nonparametric resampling procedure) to enhance sample representativeness. This approach calculates the effect sizes and confidence intervals for estimates and is more powerful than either Baron and Kenny's or Sobel's test when the assumption of normality in the sampling distribution does not hold (Selig & Preacher, 2008). For H1, the Sobel test confirms the significant indirect effect (Z-value=2.173). The bootstrapping test conducted with 500 replications (see Fritz & MacKinnon, 2007) also indicates that that the indirect effect (β=0.029) achieves significance with zero excluded within the confidence interval (p=0.031; confidence interval: 0.003 to 0.055).[9] H1, therefore, is strongly supported. For H2, the Sobel test also confirms the indirect effect (Z-value is -1.83). The bootstrapping test (again with 500 replications) shows that the indirect effect (β=-0.013) is significant at the 0.1 level (p=0.052; confidence interval: -0.026 to 0.000). Thus, for political intervention, we find evidence of mediating effects (albeit at the 10% level).

[9] According to Fritz and MacKinnon (2007), conducting 500 replications (for the bias-corrected bootstrap) is a safe choice for guaranteeing statistical power. We also conducted analyses with replications like 1000 and 5000 and the findings remain substantively unchanged.

H3 posits that institutional development negatively moderates the effect of institutional linkages on tax benefits. We introduced the interaction between institutional linkages and institutional development to predict tax breaks. In Table 2, Model 2 indicates that the interactional coefficient is not significant. Thus, H3 is not supported.

H4 proposes a negative moderating role for institutional development on the relationship between institutional linkages and political intervention. Model 4 shows that this interaction exerts a negative effect on political intervention. Therefore, H4 is supported. To display this visually, we followed the procedure of Aiken, West, and Reno (1991) to plot the moderating effects, estimating the effect of institutional linkages on political intervention at the low level of institutional development (one standard deviation below the mean of the marketization index) and the high level (one standard deviation above the mean). Figure 2 reveals that the effect of institutional linkages on political intervention is weakened in more developed institutional environments.

<Figure 2 Here>

4.1 Supplemental analysis and robustness check

We conducted several supplementary analyses to reinforce our reasoning and test the sensitivity of the results. First, one argument for proposing H1 is that association-tied firms obtain more tax policy information. We tested this assumption using one of the questionnaire items in CMES, tax policy familiarity, which asks respondents to report the degree to which they are familiar with tax break policies (e.g., 50% R&D tax credits). Responses were collected using a Likert-type scale ranging from 1 = completely unknown to 5 = very familiar. Our results confirm the positive relationship between institutional linkages and tax policy familiarity and between tax policy familiarity and tax benefits (see Appendix S1).

Second, our framework suggests that institutional linkages can make firms take on costs in relation to arbitrary intervention. Following the logic of H4, a government that emphasizes market fundamentals to support economic activities should see less intervention. We used a subindicator in the NERI index, namely the score for the extent to which local officers intervene in private businesses, to test potential moderating effects. Our results support the idea that a market-support approach reduces the effect of institutional linkages on political intervention (see Appendix S2).

Third, the measurement of "patenting success" could be subject to criticism because it cannot distinguish high-quality innovations (e.g., invention patents) from low-quality ones (e.g., utility and design patents) (Dang & Motohashi, 2015). We used two methods to alleviate this concern. First, according to Dang and Motohashi (2015), excessive numbers of applications for low-quality patents is mainly incentivized by local government patent subsidy programs. We generated a new variable, patent subsidy (the mean value of the subsidy quota that local government employs when awarding utility and design patents) and used it to analyze whether this influenced our results. The data were collected from the official documents of national or provincial Intellectual Property Administrations, with a value ranging from 150 yuan (for Beijing) to 1000 yuan (for Inner Mongolia). We did not see a significant correlation between patent subsidy and innovativeness in this context (-0.008; $p>0.1$), and the inclusion of this variable in the regressions did not change our findings (see Appendix S3). Second, we used innovation output (i.e., the turnover created by new products or technologies) to indicate the effect of institutional linkage. We still found that institutional linkages have a positive effect on innovation output and that tax break has a positive effect on

innovation output (see Appendix S4).[10] This analysis is intended to alleviate the concern that firm heterogeneity (rather than linkage heterogeneity) drives firm innovation.

Last, given that joining an association may be a self-selecting decision driven by the factors that may also influence tax benefits and political intervention, we employed a Heckman two-stage approach to address the endogeneity concern (Heckman, 1979). We attempted to find an instrument that affects institutional linkages but has little relation to tax benefits. Since there is no other useful intermediary-affiliation information in the survey, we needed to rely on other archival data. We gained insights from imprinting theory (Marquis & Tilcsik, 2013; Tilcsik, 2014) and its applications in government and business relations studies in China (Marquis & Qiao, 2018; Wang, Du, & Marquis, 2019). This literature suggests that people's perceptions and attitudes toward interactions with the government or its agencies are shaped by their ideological experience and how it fits with the political environment (i.e., imprint-environment fit). When individuals' ideological experience (i.e. of events such as extreme political campaigns that aim to strengthen communism) is consistent with their living environment (i.e., provinces that have a greater communist legacy), they are imprinted with a stronger party identity and communist ideology (Wang et al., 2019). Such an ideological imprint will lead them to act in a way that conforms to the requirements and expectations of the government. For example, during China's "Socialist Transformation" period (1953-1957), private entrepreneurs in more imprinted regions responded to the government's call for transformation more actively and transformed their enterprises into "joint state-private" or state-owned firms (Selden & Lippit, 2016). Similarly, firm leaders with a high imprint-

[10] Although turnover as an innovation proxy also has weaknesses, for a fuller picture of firm innovativeness we still tested the effects of political intervention on innovation output. It's not significant. This is probably because innovation output reflects the final commercialized value, namely, the value from products that have gone through a series of processes, including production, testing, revising and final commercialization (Katila, 2002). It may not exactly reflect the influence of political intervention. Measures of innovation output are also altered over time by statistical effects, because the commercial value underestimates their innovative activities, particularly for small firms (Pavitt, 1982).

environment fit should be more likely to be pro-government and to join government agencies like associations. Accordingly, we created an instrumental variable, *political imprint*, which reflects ideological imprint. It was coded as 1 for firms that met two requirements: (1) their leaders had experienced the Cultural Revolution (i.e., they were born during 1950-1959)[11] and (2) they were located in a region with a greater communist legacy (i.e., provinces liberated before the founding date of the People's Republic of China on 1 October 1949) (Wang et al., 2019). We assigned a value of 0 otherwise. Statistically, the correlation between political imprint and institutional linkages is 0.478, whilst the correlations between political imprint and tax breaks and political intervention are only 0.106 and 0.039, respectively, which gives a preliminary indication of the appropriateness of the instrument (Hahn & Hausman, 2003). In the first-stage model (*probit*), we regressed the likelihood of joining industry associations on political imprint and the above-stated controls. We generated the Inverse Mills Ratio (IMR) from the first stage and added it to the second-stage regressions (i.e., we reran all models in Table 2). The results remain substantively unchanged and IMR is not significant (see Table 3), indicating that our results are robust and that selection bias may not be a big concern (Heckman, 1979).[12]

<Table 3 here>

5 Discussion

5.1 Theoretical implications

This paper has sought to explore the role of government support and political intervention in the relationship between institutional linkages and firm innovativeness. Our theoretical

[11] The Cultural Revolution (1966-1976) was a sociopolitical upheaval and extremism launched by Chairman Mao Zedong in order to reassert his thoughts and government authority.

[12] We also used a more traditional instrumental variable approach and found similar results (available upon request).

development and empirical analysis explain the context within which institutional linkages can have either a positive or negative effect on innovativeness. We therefore contribute to the literature by explaining the factors that may help reconcile these two potentially conflicting effects. Institutional linkages can, on the one hand, strengthen firm innovation by facilitating access to necessary government support (in the form of tax benefits), and on the other hand impede it because they create regulatory institutional pressures. Moreover, we explain the contingent role of institutional development in the effectiveness of institutional linkages in relation to political intervention. Our study thus makes theoretical contributions in several ways.

First, it adds to the literature on the impact of institutional intermediaries on innovation (Howells, 2006; Watkins et al., 2015; Zhang & Li, 2010) by examining and comparing the positive and negative effects of industry associations. Empirical research on associations has mainly considered the wider economic impact, e.g., by analyzing their role in establishing firm networks (e.g., Qiao, Ju, & Fung, 2014). As a result, there have been several calls for more studies to explore the innovation and institutional implications of industry associations particularly within the context of emerging markets (Clayton et al., 2018; Watkins et al., 2015). Our work has responded to such calls and explained how associations in China can affect firm innovativeness and increase regulation costs. By examining both the bright and the dark sides of association membership, we demonstrate that institutional linkages have a net positive effect on firm innovativeness. Therefore, our findings indicate that the benefits of membership outweigh the costs.

Second, we explain and empirically validate the mediating role of resource benefits and political intervention. We have shown that association membership does not affect firm innovativeness directly, as has been implied in previous studies (Armanios et al., 2017; Liu, 2020). Instead, it helps provide access to resources and guidance on how to deal with

regulations, both of which affect a firm's ability to develop new products. This mediating effect confirms the view that resource benefits can be gained due to linkages with intermediaries (Howells, 2006; Zhang & Li, 2010) by providing evidence that strengthens the link between institutional linkages and firm innovativeness.

Third, our finding of the existence of a mediating effect indicates that, at least in the context of China, institutional linkages encourage political intervention in a way that affects firm innovativeness. This finding indicates the existence of institutional regulations that may be impeding innovation within firms in these economies. Thus, we extend the work of Sine et al. (2005), who focused on new firms, and suggest that trade associations tend to reduce the heterogeneity of foundings, in two ways. First, by focusing on Chinese professional associations, we confirm that the effect of institutional linkages on innovativeness extends to emerging economies and small businesses. Second, we explain that such linkages will encourage political intervention. In their work they suggested that associations would be dominated by a few "wealthier, relative conservative" players who will influence the technologies being adapted. New firms that adapt these technologies therefore face reduced levels of risk and increase the chances of success. Although our findings do not contradict this argument, they do suggest that a firm's innovativeness will depend on political intervention and be contingent upon the level of development of the market within which it operates.

Our findings, therefore, advance the recent literature on the so-called dark side of institutional intermediaries and the effects of collaboration with government (e.g., Eberhart & Eesley, 2018). We take an institutional view of regulatory pressure that reveals the price of achieving legitimacy (Ahuja & Yayavaram, 2011; Marquis & Raynard, 2015; Suchman, 1995). Legitimization requires an organization to comply with the norms of an association, which includes accepting its dictates and rules (Pfeffer, 1976; Scott, 1995). This can result in extra cost and hurt firms' innovation capabilities (Meyer & Rowan, 1977) because it may

weaken the development of productive capabilities such as efficiency and innovation (Ahuja & Yayavaram, 2011).

Furthermore, collaboration with government and alignment with policies are, at times, advocated as key enablers of higher levels of innovation (Etzkowitz & Leydesdorff, 2000; Lundvall, 2010). However, our results suggest that this can be complicated. Alignment with institutional intermediaries, which in China can be connected to government bodies, will facilitate access to more resources in the form of tax benefits, but will also invite political intervention. Depending on the context, and especially for smaller firms, such alignment may, therefore, have a negative effect on innovativeness. Thus, our study has uncovered two influential, and potentially competing, mechanisms that jointly explain the relationship between institutional linkages and firm innovativeness. By explaining the role of both tax benefits and political intervention, our work contributes to the understanding of why public efforts to develop intermediaries to support firms do not necessarily lead to the anticipated results.

We show that there is a constant interplay between the bright and dark sides of industry associations which is contingent upon the degree of institutional development. Intermediaries are embedded in institutional contexts which determine the relationships between organizations. The scope of their operations is not determined solely by the problem they were created to handle but evolves over time. As a result, we show that intermediaries are less prone to functionalism and that they have both weak and strong attributes.

A final and important contribution of our study is that we show that the effect of institutional linkages on political intervention is weakened when institutional environments improve. This reveals the significance of institutional heterogeneity in shaping a nonmarket strategy and highlights a limitation to the effectiveness of institutional linkages (Dorobantu, Kaul, & Zelner, 2017). This contingency perspective supports the view that institutional

development weakens the political role of nonmarket strategy (Peng, 2003; Webb et al., 2009). However, we have not found the moderating effect of institutional development between institutional linkages and tax breaks to be significant. One possible explanation for this relates to their size and resource constraints. Industry associations in different regions play an influential role in supporting these vulnerable businesses. Thus, institutional linkages may have a positive relationship with tax support across different institutional environments. A second reason for the absence of the moderating effect is the emergence of new intermediaries as institutions become more developed and the inevitable competition between them. When institutions are less developed, there are relatively few intermediaries aiming to cover greater institutional voids. As a result, intermediaries have to fulfil a wide spectrum of needs (Mair et al., 2012). However, when institutions become more developed, new intermediaries are more likely to concentrate their efforts on addressing more specific types of needs (Dutt et al., 2016). Such specialization may give rise to different types of intermediaries which influence business behavior in unique and novel ways. Therefore, the lack of the moderating effect may be the result of this sequencing of emergence of intermediaries. Although our data is not detailed enough to test this proposition, its intuitive appeal could explain how certain types of intermediaries would matter in certain stages of institutional development.

5.2 Practical implications

Our findings also provide several important recommendations for both managers in small firms and policymakers aiming to cultivate an ecosystem of innovation. Central and local government in China are more likely to focus their attention on firms that make a greater contribution to economic growth (such as state-owned enterprises). When this is the case, small businesses may find it difficult to build political connections. Our results suggest that industry associations can be an effective platform for them to access public resources, as they

generate certifications and provide information on how to access such support. However, we also suggest that the relationships with industry associations can have a negative effect: although they may enable firms to obtain support more easily, they also entail political intervention that may hurt firm innovation. Thus, small-firm managers who turn to these associations to gain legitimacy may also need to consider the potential intervention that may result from their legitimation efforts. For example, they should carefully assess the extent to which embeddedness can allow them to make the most of institutional support, but at the same time they need to avoid over-embeddedness and consequent intervention.

Furthermore, it is evident that small business development has achieved relatively limited attention from Chinese policymakers. However, small businesses are important for fostering innovativeness. Industry associations, which function as intermediaries, can bridge the link between these firms and the state, providing better access to policy information and institutional support. Governments should develop efficient market intermediaries to decrease information asymmetry and raise awareness about supportive policies, as this can ignite market innovativeness. Additionally, although sectoral regulations might have their own political goals, they can hurt the efficiency of firms' innovation. Policymakers need to recognize the harm political issues can cause in the private sector, as well as the importance of institutional environments in supporting private sectors. A well-cultivated institutional environment is important for small businesses.

5.3 Limitations and future directions

Our study is not without limitations. First, we used primary survey data matched with data from other archives, and as a result, the limitations typically associated with cross-sectional studies are present. We encourage future researchers to consider a longitudinal design to better capture the dynamics of intermediaries' effects. A dynamic view is meaningful since the influence of institutional linkages might change over time, particularly considering that

China is undergoing economic reform and experiencing institutional transition. Second, given the weaknesses in our database, we used a simple measurement, patenting success, as a proxy for firm innovativeness. Future research could refine this measure by distinguishing high- from low-quality innovation (Dang & Motohashi, 2015). Third, our research context is China, a country undergoing institutional transition, which may limit the generalizability of our findings to other economies. For example, the state in both China and India dominates economic reform and market development. However, compared to China's innovation system, which relies on multilevel government as the unit of regional innovation development, India's innovation system stresses the importance of information from pluralistic industries and diversified market actors, such as social groups (Khanna & Palepu, 2000b; Watkins et al., 2015). Such subtle nuances may lead associations in different countries to take up different positions in the national innovation system, thus playing distinct roles with diverse effects on businesses. Therefore, we call for comparative research on associations within different economies to obtain insights into the impact of intermediaries that are related to specific cultural, institutional, and economic characteristics.

In addition to addressing some of the limitations of our findings and enriching our theoretical framework, future researchers could explore some additional questions generated as a result of our work. The most profound of these is the effect of the relative power of the intermediaries. Although this is not what we have explicitly covered, it is inevitable that some intermediaries will have greater influence than others. When this is the case, membership is likely to have significant effects on how a firm runs and on how it engages with the government. Future work could therefore explore this in greater detail, possibly by theorizing on the effects of power on both the likelihood of political intervention and the effect this will have on how a firm manages its innovation process.

Appendices

Appendix A. Regressions of tax policy familiarity (to see the relationship between institutional linkages and tax policy familiarity, and the relationship between tax policy familiarity and tax breaks)

Appendix B. Regressions of using market-support approach (to see the moderating role of market-support approach between institutional linkages and political intervention)

Appendix C. Regressions of adding patent subsidy into regressions

Appendix D. Regressions of innovation output (as an alternative measurement of firm innovativeness)

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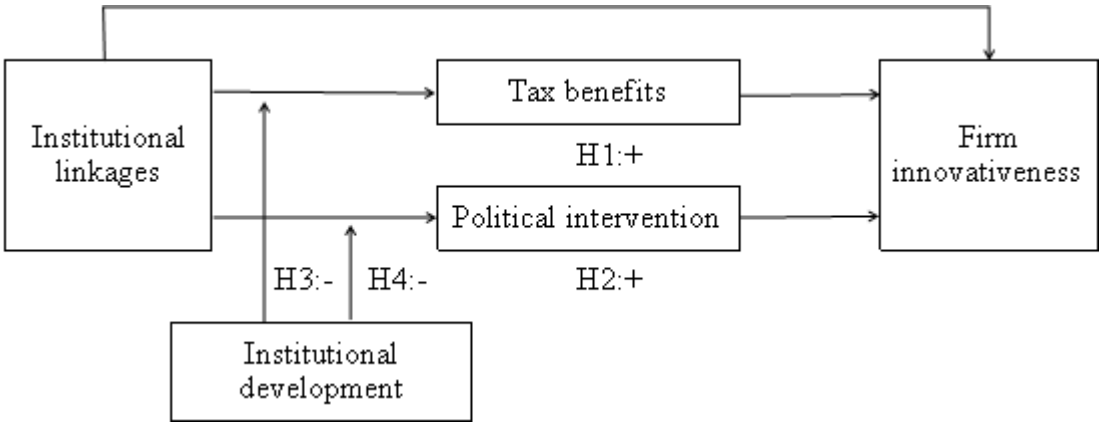
Figure 1. The effects of institutional linkages on firm innovativeness



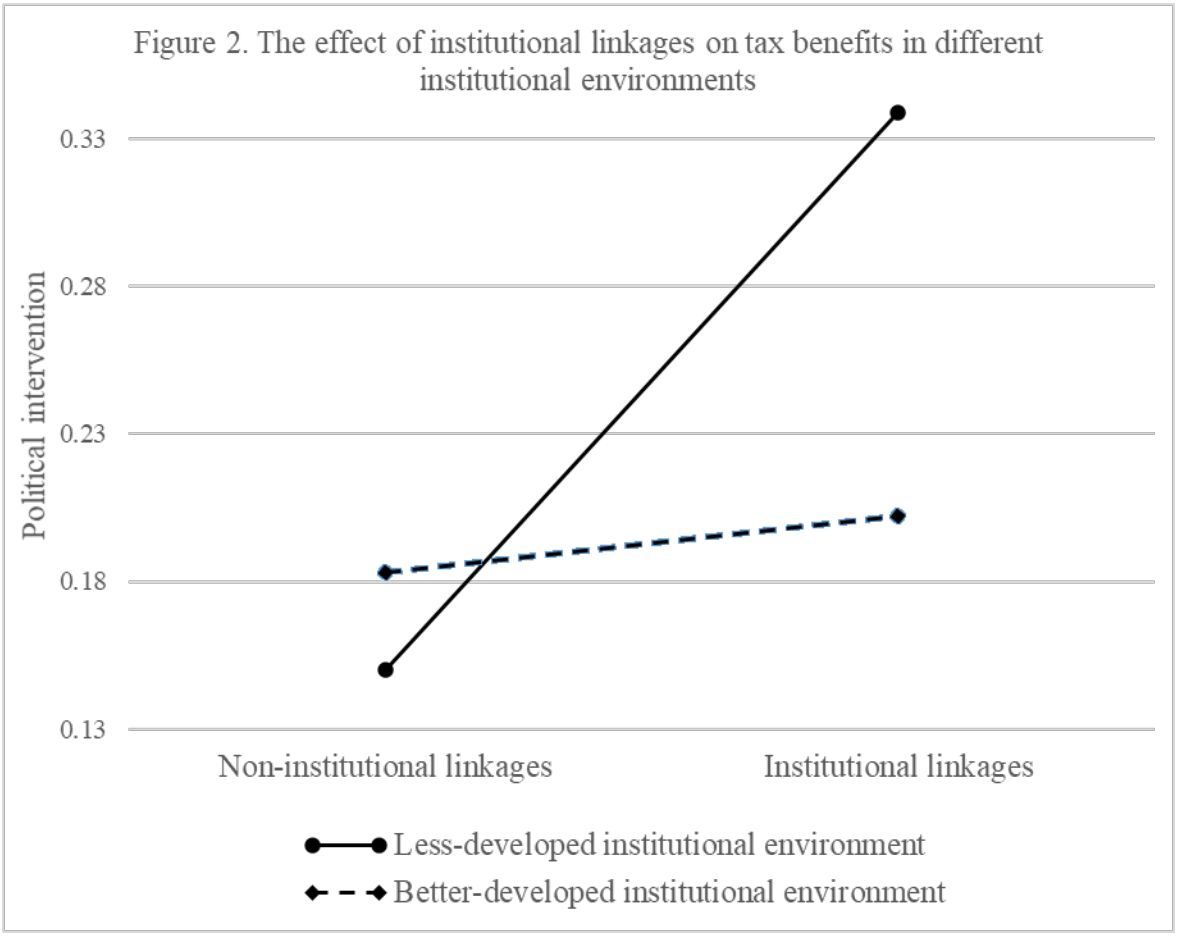


Figure 2. The effect of institutional linkages on tax benefits in different institutional environments
Political intervention
0.33
0.28
0.23
0.18
0.13
Non-institutional linkages
Institutional linkages
Less-developed institutional environment
Better-developed institutional environment

Table 1. Variable description and correlation

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
Patenting success	0.34	0.47												
Tax break	0.20	0.40	0.39*											
Political intervention	0.22	0.42	-0.09*	-0.06										
Institutional linkages	0.50	0.50	0.20*	0.18*	0.13*									
Institutional development	8.15	1.56	-0.04	-0.02	-0.06	-0.06								
Firm age	8.73	6.29	0.11*	0.07	0.09*	0.14*	0.13*							
Firm size	15.68	2.16	0.29*	0.21*	0.00	0.21*	0.00	0.16*						
Political experience	0.03	0.17	0.06	0.01	-0.04	-0.03	-0.05	-0.03	-0.03					
Business ties	0.57	0.23	0.10*	0.09*	0.02	0.09*	-0.08*	0.14*	0.17*	0.14*				
Employee number	3.70	1.13	0.27*	0.26*	0.03	0.35*	0.01	0.23*	0.57*	0.07	0.24*			
Profitability	1.72	0.86	-0.16*	-0.08	0.02	-0.04	-0.12*	-0.07	-0.16*	0.03	-0.06	-0.13*		
R&D intensity	10.56	3.99	0.31*	0.18*	-0.04	0.14*	0.03	0.04	0.27*	0.09*	0.08	0.32*	-0.07	
Employee learning	1.82	0.96	-0.13*	-0.10*	0.06	0.05	0.07	0.14*	-0.01	0.01	-0.05	-0.05	0.07	-0.17*

Note: Pearson's correlation coefficients. * $p<0.05$.

Table 2. The relationship between institutional linkages and firm innovativeness (H1-H4)

	Tax break		Political intervention		Firm innovativeness			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Firm age	0.013	0.012	0.028*	0.027	0.030	0.029	0.032*	0.032
	(0.019)	(0.019)	(0.017)	(0.017)	(0.019)	(0.020)	(0.019)	(0.020)
Firm size	0.184**	0.179**	-0.045	-0.042	0.258***	0.201**	0.255***	0.208**
	(0.085)	(0.085)	(0.057)	(0.057)	(0.085)	(0.087)	(0.087)	(0.088)
Political experience	-0.115	-0.124	-0.786	-0.856	0.501	0.642	0.471	0.623
	(0.648)	(0.657)	(0.793)	(0.800)	(0.572)	(0.604)	(0.577)	(0.605)
Business ties	0.139	0.174	0.071	0.029	-0.104	-0.217	-0.049	-0.286
	(0.446)	(0.448)	(0.456)	(0.464)	(0.458)	(0.481)	(0.463)	(0.496)
Employee number	0.384***	0.383***	-0.008	-0.001	0.050	0.004	0.036	-0.001
	(0.143)	(0.143)	(0.122)	(0.124)	(0.135)	(0.139)	(0.136)	(0.141)
Profitability	-0.111	-0.116	0.041	0.053	-0.305**	-0.285**	-0.300**	-0.272**
	(0.142)	(0.143)	(0.124)	(0.125)	(0.129)	(0.133)	(0.130)	(0.135)
R&D intensity	0.045	0.045	-0.016	-0.016	0.172***	0.171***	0.172***	0.171***
	(0.038)	(0.038)	(0.028)	(0.028)	(0.044)	(0.045)	(0.044)	(0.045)
Employee learning	-0.264*	-0.264*	0.086	0.096	-0.278**	-0.257*	-0.268**	-0.248*
	(0.151)	(0.151)	(0.109)	(0.111)	(0.134)	(0.140)	(0.135)	(0.142)

Institutional development	0.008	-0.123	-0.110	0.077	-0.079	-0.080	-0.100	0.092
	(0.076)	(0.126)	(0.068)	(0.111)	(0.071)	(0.073)	(0.072)	(0.116)
Institutional linkages	0.587**	-1.038	0.617***	3.104***	0.515**	0.433*	0.592***	3.222**
	(0.253)	(1.268)	(0.231)	(1.166)	(0.225)	(0.235)	(0.230)	(1.268)
Institutional linkages × Institutional development (H3, H4)		0.201		-0.307**				-0.331**
		(0.154)		(0.140)				(0.151)
Tax break (H1)						1.525***		1.558***
						(0.278)		(0.284)
Political intervention (H2)							-0.579**	-0.567*
							(0.276)	(0.292)
_constant	-6.431***	-5.275***	-0.208	-1.859	-5.870***	-5.053***	-5.559***	-6.557***
	(1.441)	(1.675)	(1.017)	(1.294)	(1.326)	(1.343)	(1.348)	(1.611)
chi2	79.601	81.296	20.663	25.619	116.561	148.392	121.121	156.557
Log-Likelihood	-237.71	-236.87	-278.97	-276.49	-269.46	-253.55	-267.18	-249.46
Number of observations	548	548	548	548	511	511	511	511
Province	No	No	No	No	No	No	No	No
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.143	0.146	0.036	0.044	0.178	0.226	0.185	0.239

Note: *** p<0.01, ** p<0.05, * p<0.1; standard errors in parentheses. Including province dummies does not change our findings but were excluded due to multicollinearity.

Table 3. Heckman two-stage results

	Institutional linkages	Tax break		Political intervention		Firm innovativeness			
	First-stage	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Firm age	0.055***	0.012	0.012	0.028	0.027	0.030	0.029	0.032*	0.032
	(0.012)	(0.019)	(0.019)	(0.017)	(0.017)	(0.019)	(0.020)	(0.019)	(0.020)
Firm size	0.005	0.184**	0.179**	-0.046	-0.042	0.258***	0.201**	0.255***	0.208**
	(0.036)	(0.085)	(0.085)	(0.057)	(0.057)	(0.085)	(0.087)	(0.087)	(0.088)
Political experience	-0.490	-0.083	-0.089	-0.769	-0.842	0.498	0.623	0.472	0.599
	(0.406)	(0.654)	(0.662)	(0.796)	(0.803)	(0.576)	(0.608)	(0.581)	(0.610)
Business ties	-0.076	0.132	0.167	0.074	0.032	-0.104	-0.214	-0.049	-0.285
	(0.338)	(0.448)	(0.450)	(0.457)	(0.464)	(0.458)	(0.481)	(0.463)	(0.496)
Employee number	0.425***	0.365**	0.362**	-0.023	-0.013	0.052	0.014	0.036	0.011
	(0.077)	(0.150)	(0.150)	(0.130)	(0.132)	(0.141)	(0.145)	(0.143)	(0.147)
Profitability	0.064	-0.110	-0.115	0.040	0.052	-0.305**	-0.285**	-0.300**	-0.273**
	(0.076)	(0.142)	(0.143)	(0.124)	(0.125)	(0.129)	(0.133)	(0.130)	(0.135)
R&D intensity	0.022	0.045	0.045	-0.016	-0.017	0.172***	0.171***	0.172***	0.171***
	(0.018)	(0.038)	(0.038)	(0.028)	(0.028)	(0.044)	(0.045)	(0.044)	(0.045)

Employee learning	0.139*	-0.271*	-0.270*	0.082	0.092	-0.277**	-0.253*	-0.268**	-0.243*
	(0.072)	(0.153)	(0.152)	(0.110)	(0.112)	(0.135)	(0.140)	(0.136)	(0.143)
Institutional development		0.006	-0.126	-0.112	0.075	-0.079	-0.078	-0.100	0.094
		(0.076)	(0.126)	(0.068)	(0.111)	(0.071)	(0.074)	(0.072)	(0.116)
Institutional linkages		0.519*	-1.123	0.571**	3.055***	0.522**	0.470*	0.591**	3.280**
		(0.298)	(1.281)	(0.269)	(1.179)	(0.266)	(0.279)	(0.269)	(1.284)
Institutional linkages × Institutional development			0.202 (0.154)		-0.305** (0.140)				-0.333** (0.151)
Tax break							1.527*** (0.278)		1.561*** (0.285)
Political intervention								-0.579** (0.276)	-0.565* (0.292)
Political imprint	2.359*** (0.238)								
Inverse Mills ratio		-0.096	-0.102	-0.062	-0.049	0.008	0.047	-0.001	0.055
		(0.225)	(0.225)	(0.187)	(0.188)	(0.183)	(0.189)	(0.184)	(0.190)
_constant	-4.670***	-6.182***	-5.002***	-0.037	-1.715	-5.893***	-5.182***	-5.555***	-6.720***
	(0.629)	(1.550)	(1.776)	(1.141)	(1.407)	(1.419)	(1.440)	(1.441)	(1.709)
chi2	250.732	79.785	81.503	20.772	25.685	116.563	148.455	121.121	156.641

Log-Likelihood	-254.47	-237.62	-236.76	-278.92	-276.46	-269.46	-253.51	-267.18	-249.42
Number of observations	548	548	548	548	548	511	511	511	511
Province	Yes	NO	NO	NO	NO	NO	NO	NO	NO
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.330	0.144	0.147	0.036	0.044	0.178	0.226	0.185	0.239

Note: *** p<0.01, ** p<0.05, * p<0.1; standard errors in parentheses.