

Do government connections improve or impede small businesses' innovation?

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Abstract

Purpose – This study examines whether and how having government connections is associated with small businesses' innovation. In addition, the authors attempt to explore the moderating impacts of country-level corruption and bank market power on the association between government connections and innovation.

Design/methodology/approach – Throughout the study, we employ the probit regression technique with industry and time fixed effects on a sample of 103,883 observations from 122 countries between 2011 and 2022.

Findings – On average, firms with government connections are more likely to introduce innovative activities, whereby this positive association is robust to various tests using alternative estimation methods, different indicators and sample selection criteria. Furthermore, firms with government connections tend to invest more in R&D and have greater financial access than those without such connections. Importantly, the impact of government connections on innovative activities tends to be stronger in countries with higher bank market power.

Originality/value – This study is the first that hypothesizes and tests the potential moderating effects of country corruption and bank market power on the government connections–innovation nexus. Thus, we contribute to the literature by specifying when government connections may lead to innovation. Moreover, this study enhances the existing literature by utilizing a large, cross-country sample including small businesses, which are often overlooked. In addition, we validate the channels linking government connections and innovative activities.

Keywords Bank market power, Corruption, Government connections, Innovation, Small businesses, WBES

Paper type Research article

1. Introduction

Having connections with the government or political parties can significantly influence various facets of firm operations (Boubakri *et al.*, 2008; Hou *et al.*, 2017). Existing literature suggests that such connections can alter financial performance (Li *et al.*, 2008; Li and Jin, 2021; Niessen and Ruenzi, 2010; Wu *et al.*, 2012) or access to finance (Bao *et al.*, 2016;



Cull *et al.*, 2015; Faccio, 2006; Qi and Nguyen, 2020). Further, government connections offer firms financial benefits, such as government subsidies (Wu and Liu Cheng, 2011) or bailouts (Faccio *et al.*, 2006).

Government connections can also influence innovation. On the one hand, such connections may increase innovative activities through the improvement of financial performance (Li *et al.*, 2008; Li and Jin, 2021; Wu *et al.*, 2012) and access to finance (Qi and Nguyen, 2020). In addition, firms with connections are more informed of government policies and information related to innovative strategies (Tsai *et al.*, 2019). On the other hand, having government connections can decrease innovation. The reason is that politically connected firms face less competition and suffer from the issue of overinvestment (Hou *et al.*, 2017), leading to the inefficient allocation of limited resources to innovative activities. The empirical studies related to this topic are scarce and provide mixed findings.

Revisiting conflicting theoretical grounds and competing empirical results, this study employs a sample of 103,883 observations covering 122 countries worldwide from the World Bank Enterprises Surveys (WBES) to examine the association between government connections and innovation. This research is motivated by several reasons as follows.

First, innovation improves a nation's long-term economic development (Aghion and Howitt, 1992; Romer, 1990). At the firm level, innovation benefits various aspects of firm operations (Bigliardi *et al.*, 2020; Simeth and Cincera, 2015). Importantly, innovation is essential for firms – including SMEs – to achieve sustainable development (Agoraki *et al.*, 2023; Dzhunushalieva and Teuber, 2024) [1]. Innovative activities can alter costs in the production process and offer initiatives to achieve sustainable development goals (Dzhunushalieva and Teuber, 2024; Marini Govigli *et al.*, 2022). Oliveira-Duarte *et al.* (2021) suggest that together with partnerships, innovation plays an important role in addressing complex challenges of sustainable development. Hence, finding drivers of innovation is always essential, offering implications for policymakers, firm managers and other stakeholders (Nguyen *et al.*, 2022b; Snihur and Wiklund, 2019).

Moreover, extant literature yields conflicting perspectives on the government connections–innovation nexus and mechanisms linking the two. Importantly, moderators which potentially explain mixed findings still exist, partially explaining the conflicting results documented in the literature. Thus, validating mechanisms and exploring possible moderating effects will offer fruitful avenues for theoretical contributions.

We find that firms with government connections are more likely to introduce innovative activities. This positive relationship is confirmed when using alternative measures of innovation, alternative sample selection criteria and different estimation techniques. Given that firms with government connections tend to achieve superior performance and be informed about innovation-related policies, they can confidently allocate their resources to R&D activities as a major input of innovation. Moreover, since the literature has well documented the impact of finance on innovation (He and Tian, 2018; Qi and Ongena, 2019), we ask whether having government connections is positively associated with financial access.

For this purpose, we investigate whether having government connections is associated with larger R&D investment and broader access to finance. Our analysis indicates that firms with government connections tend to have a higher likelihood of R&D investment, whereby R&D significantly enhances innovative activities. In addition, having close ties with the government can broaden financial access, which in turn promotes innovative activities.

Further, since government connections might have contradictory effects on innovative activities, finding the relevant moderators is essential, providing implications for scholars and policymakers. Specifically, we establish hypotheses and test whether country-level corruption and bank market power have moderating effects on the association between government connections and innovation. When including the interaction terms in the model, we do not find statistical evidence that corruption moderates the government connections–innovation nexus. Interestingly, the estimation reveals that the positive impact of government connections on innovation is stronger in countries with higher bank market power.

Our study provides theoretical contribution as follows. By incorporating interaction effects into the analysis, we document that banking structure (i.e. bank market power) can moderate the impact of government connections on innovative activities. Thus, our findings can explain the heterogeneity in the relationship between government connections and innovation found in prior studies. Additionally, while prior studies (Chen *et al.*, 2005; Hou *et al.*, 2017) extensively focus on the “know-who” mechanism (i.e. a firm might use political advantages for private benefits), we hypothesize and test the “know-how” mechanism demonstrated by Qi and Nguyen (2020). Our data sample is suitable for testing this mechanism because it is less likely that small businesses’ managers are working in top governmental agencies, as in Hou *et al.* (2017) or Bao *et al.* (2016).

We also validate the channels through which government connections link with innovation. Indeed, the “know-how” mechanism highlights the benefits of having close ties with government entities, from which firms obtain more information about necessary procedures and processes. As a result, firms are more confident to gain access to finance from banks (Qi and Nguyen, 2020) and allocate more resource to innovative activities (Li *et al.*, 2008; Li and Jin, 2021; Tsai *et al.*, 2019; Wu *et al.*, 2012).

Empirically, while relevant studies focus intensively on listed corporations operating in a single market, such as China (Hou *et al.*, 2017; Liu *et al.*, 2021; Tsai *et al.*, 2019), we employ a large cross-country sample of 122 countries worldwide, thereby enhancing the generalization of the results. In addition, we can control various macroeconomic variables that have been proven to affect innovation by using a cross-country setting.

Next, in contrast to the aforementioned articles, the nature of WBES data allows us to focus on small businesses, which have previously been ignored by empirical studies (e.g. Tsai *et al.*, 2019) [2]. Compared with large corporations, innovation is critical for small businesses with a simple organizational structure, limited financial resources and extensive reliance on debt financing rather than equity financing (Daskalakis *et al.*, 2013; Wang *et al.*, 2023). In addition, given that small businesses account for more than 90% of total firms around the world (Beck, 2013) and are emphasized as the “engine of innovation” (Acs and Virgill, 2010; Afuah, 2003), they cannot be ignored from the empirical analysis.

Following this introduction, Section 2 shows the literature review. Section 3 describes the data, measures and methods before Section 3 describes the empirical results. Finally, Section 4 provides a conclusion and outlines the limitations of the study.

2. Literature review

2.1 *The relationship between government connections and innovation*

Existing literature suggests that government connections may impact innovative activities, but the direction is ambiguous. On the one hand, having government connections is favorable for firm innovation for at least two reasons. First, prior studies show that firms with political connections achieve superior performance when compared to those without such connections (Li *et al.*, 2008; Li and Jin, 2021; Wu *et al.*, 2012). In addition, Tsai *et al.* (2019) demonstrate that politically connected firms are more informed of government policies and information related to innovative strategies. Thus, having government connections can enhance firms’ financial resources and confidence to invest in research and development (R&D) activities, which subsequently translates into innovation outputs.

Second, given that innovation is capital-intensive and requires substantial funds (Brown *et al.*, 2012; Hall and Lerner, 2010; Qi and Ongena, 2019; Savignac, 2008), government connections can support innovation by enhancing access to external finance (e.g. from banks). Specifically, Khwaja and Mian (2005) find that lenders favor politically connected firms regarding loan quantity, while Faccio (2006) adds that politically connected firms enjoy lower loan interest rates. Qi and Nguyen (2020) illustrate that government connectedness positively affects SMEs’ credit access by encouraging them to approach banks for a loan. Li *et al.* (2008) and Cull *et al.* (2015) support this notion, claiming that having connections with the Chinese

government reduces financial constraints. [Fu et al. \(2017\)](#) add that firms with political connections tend to have broader access to state-owned banks' loans.

On the other hand, existing literature suggests that government connections hinder innovative activities. [Hou et al. \(2017\)](#) show that politically connected firms face less market competition and increased overinvestments, leading to the inefficient allocation of limited resources to innovative activities. Specifically, firms with strong connections with the government face lower market competition for innovation. Therefore, those firms are less motivated to innovate because they are more likely to receive grants or even orders from the government, which help them survive in the market ([Hou et al., 2017](#)). In addition, politically connected firms have an issue of over-investment due to the redundancy in human resources or short-term production ([Chen et al., 2011](#)). As a result, firms are less likely to devote their resources to long-term innovation investments. [Hou et al. \(2017\)](#) conclude that political connections negatively affect corporate innovation activities and efficiency.

Some studies have explored the relationship between political/government connections and innovation and the result is mixed. For example, using a data sample of Chinese listed companies from 2008 to 2014, [Tsai et al. \(2019\)](#) find that government connections benefit corporate innovation. [Liu et al. \(2021\)](#) document the conflicting impacts of political connections on innovation when using a data sample from Chinese listed enterprises. Specifically, the authors find that politically connected firms have more access to financial resources, leading to more innovations. However, these firms have fewer incentives to engage in high-quality innovation. The above theories and empirical studies allow us to establish two opposing hypotheses as follows:

- H1. Having government connections is positively associated with innovation.
- H2. Having government connections is negatively associated with innovation.

2.2 The potential moderating effects of corruptions and bank market power on the government connections–innovation nexus

We argue that the ambiguous impact of government connections on innovation may be due to the moderating effects of some countries' traits. First, corruption levels could be a potential candidate. Small, young and/or innovative firms are more vulnerable to the rent-seeking behavior of officials than other counterparts ([Murphy et al., 1993](#)). In addition, they frequently engage with regulatory agencies in various processes, in which bribery is likely to occur. Thus, if these interactions are costly or frequent, corruption may hinder essential innovative activities ([Ellis et al., 2020](#)). [Anokhin and Schulze \(2009\)](#) state that control of corruption increases the levels of trust, which ultimately leads to investment in innovation from economic entities. Moreover, even when the firms are familiar with processes and procedures, corrupted officials can exploit the rents gained from successful innovations ([Murphy et al., 1993](#)). As a result, firms may be discouraged from investing in innovative activities, such as R&D. Therefore, we expect that the impacts of government connections on innovation will be weaker (stronger) in countries with higher (lower) levels of corruption. The above arguments lead to the next hypothesis, as follows:

- H3. The effects of government connections on innovation will be weaker in countries with higher levels of corruption.

Second, we examine how bank market power moderates the effect of government connections on innovation. It is documented that competition in the banking sector influence access to finance ([Boot and Thakor, 2000](#); [Leon, 2015](#); [Petersen and Rajan, 1995](#)), which is the channel through which government connections positively influence innovation. Specifically, in a less competitive banking sector, creditors (such as banks) can assure future profits from firms. Thus, they accept the lower return and expect that the future surplus can compensate for the initial investment ([Petersen and Rajan, 1995](#)). Empirically, various studies support the notion

that bank market power can alleviate credit constraints such as [Han et al. \(2009\)](#), [Mac an Bhaird et al. \(2016\)](#) and [Nguyen et al. \(2022a\)](#). Since access to financial services is essential to innovation, we expect that the positive impact of government connections on innovation is more pronounced in countries with higher level of bank market power. Based on the above-mentioned theories and empirical evidence, we establish the following hypothesis:

- H4. The effects of government connections on innovation will be stronger in countries with higher bank market power.

3. Method

3.1 Data and sampling

The source of firm-level data is the WBES. We obtain country-level data from the World Development Indicators. The original WBES dataset contains information on more than 190,000 firm interviews across 154 countries worldwide. To construct the data sample for the current study, we apply some filters as follows. First, to strengthen the validity and accuracy of the sample, we employ question a16, which indicates the interviewers' perception of the truthfulness of interviewees' answers. Following relevant studies employing the WBES (e.g. [Leon, 2015](#); [Mallik et al., 2022](#); [Nguyen et al., 2022b](#)), we drop observations that are considered "not truthful" by the interviewers. Second, we remove firms that do not have information on key firm-level variables such as size, age, legal status, ownership types, or innovation. Third, we drop firms operating in countries with missing values on macroeconomic variables. The final data sample contains 103,993 observations, covering 122 countries globally from 2011 to 2022.

3.2 Measuring government connections

Scholars propose various measures of government connections. For example, [Cull et al. \(2015\)](#) consider a firm to be government-connected if the government holds shares or appoints its chief executive officers. [Hou et al. \(2017\)](#) classify a firm as government-connected if its chairman or general managers are former or current government officials. [Faccio \(2006\)](#) considers a firm to have a connection with the government if one of its block shareholders or top managers is a member of parliament, minister, or head of state or closely tied to a high-ranking official. The denoted indicators are not widely available at the cross-country level and are primarily for large and listed corporations.

[Qi and Nguyen \(2020\)](#) define a firm as government-connected when it has economic contracts or attempts to secure one with the government. The authors claim that those firms frequently interact with the government and its entities. In addition, firms that carry out such contracts have close government ties due to being familiar with various government procedures.

Accordingly, we employ question j6a in the WBES, which asks whether a firm has secured (or attempted) a government contract during the last twelve months. A firm that answered "Yes" to this question is considered to have connections with the government. As our variable of interest, CONNECTION equals one if the firm has a government contract secured or attempts to secure a government contract and zero otherwise.

3.3 Measuring innovation

Innovation is commonly defined as the process of devising a new idea or developing an existing idea. In other words, corporate innovation refers to the process through which firms invent and apply new ideas, technologies and working methods to drive growth, improve efficiency and remain competitive in the marketplace [3]. Innovation can turn new concepts into realities, generating wealth and power. While prior studies have used various measures including R&D expenditures, patent counts, or citations to measure corporate innovation, such

indicators are typically available for large firms or listed corporations but not small businesses (Nguyen *et al.*, 2022b).

Following relevant literature (Nguyen *et al.*, 2022b; Qi and Ongena, 2019), we employ questions h1 and h5 to construct the innovation indicator. Specifically, question h1 asks whether the firm has introduced new products/services, while question h5 investigates whether the firm has introduced or significantly improved its process. The dependent variable – INNOVATION – is a dummy variable that equals one if a firm has introduced new products or services or introduced or significantly improved processes and zero otherwise. The computation of this variable is in accordance with the definition of innovation proposed by the OECD (2005, p. 46):

An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.

3.4 Research method

We employ the following probit model to investigate the relationship between government connections and innovation:

$$INNOVATION_{i,j,t} = \alpha_1 + \beta_1 * CONNECTION_{i,j,t} + \gamma_1 * X_{i,j,t} + \varepsilon_{i,j,t} \quad (1)$$

Moreover, to investigate the potential moderating impacts of corruption and bank market power on the government connections–innovation nexus, we use the following model:

$$INNOVATION_{i,j,t} = \alpha_2 + \beta_2 * CONNECTION_{i,j,t} + \beta_3 * M_{j,t} + \beta_4 * CONNECTION_{i,j,t} * M_{j,t} + \gamma_2 * X_{i,j,t} + \varepsilon_{i,j,t}$$

where i , j and t represent the firm, country and year, respectively. M is either corruption or bank market power indicator.

The dependent variable is INNOVATION, while the key variable is CONNECTION. We pay attention to the estimate of the CONNECTION variable (β_1). If β_1 is positive and significant, we find a positive relationship between government connections and innovative activities and vice versa.

In models 1 and 2, X is the matrix of control variables. We include various control variables at the firm and country level, following existing literature regarding the determinants of innovation (Bhattacharya and Bloch, 2004; Bortolotti *et al.*, 2018; Choi *et al.*, 2012; Nguyen *et al.*, 2022b; Park, 2018; Qi and Ongena, 2019).

Specifically, at the firm level, we employ firm age (LNAGE) measured by the natural logarithm of the firm's age and size (LNSIZE) measured by the natural logarithm of the number of permanent, full-time employees. Next, we include a dummy variable to characterize whether the firm has financial statements audited (AUDITED), representing the quality of financial reporting (Cohen *et al.*, 2004; Cole and Frost, 2018; Francis *et al.*, 1999; Hope *et al.*, 2011). We consider whether the top manager is female by including a dummy variable (FEMALE) in the model. Moreover, we include firms' legal status in the specifications, adding dummies to indicate whether the firm has the legal status of proprietorship (PROPRIETORSHIP) and whether it is listed on a stock exchange (LISTED). We also employ EXPORTER as a dummy indicating whether the firm is an exporter. In addition, we employ two dummies to indicate whether the firm is owned by foreign entities (FOREIGN) or state-owned (STATE_OWNED).

At the country level, we include the share of trade on gross domestic product (GDP) to capture the level of trade/openness since trade liberalization can influence innovation

(Impullitti and Licandro, 2018; Shu and Steinwender, 2018). In addition, existing literature has shown the negative impact of inflation on innovation (Andrade Rocha *et al.*, 2021; Chu *et al.*, 2015; Ramzi and Wiem, 2019). Finally, we include the annual GDP growth rate as an independent variable in our specifications.

Internet Appendix IA.3 presents the justification of the inclusion of controls into the models. Table 1 describes the definitions and sources of all variables used in this study.

Moreover, we include industry-fixed effects in all specifications to control unobserved and time-invariant characteristics across industries in the data sample. We also employ time-fixed effects to account for the global business cycle. Following Qi and Ongena (2019), we double cluster standard errors at the country-industry level.

4. Findings

4.1 Descriptive statistics

Table 2 displays the summary statistics of all variables. In our sample, 16.25% of firms have connections with the government, while 42.07% have innovative activities. The means (standard deviation) of LNSIZE and LNAGE are 3.2831 (1.3653) and 2.738 (0.8047), respectively. More than half of firms have audited financial statements, 31.82% have the legal status of proprietorship and 4.85% are listed companies. In the sample, 0.5% (6.21%) of the firms are government-owned (foreign-owned).

Internet Appendix IA.1 shows the distribution of the final sample by time, while Internet Appendix IA.2 shows summary statistics for INNOVATION and CONNECTION by country.

Table 3 shows the correlation matrix of all variables. It is evident that CONNECTION has a positive correlation with INNOVATION. Moreover, it is observed that the correlation coefficient between each pair of variables is quite low, meaning that multicollinearity is less likely to be a severe issue in our study (Wooldridge, 2015).

4.2 Government connections and innovation: baseline results

As a preliminary check, we conduct a *t*-test to compare the means of INNOVATION between two groups: (1) firms without government connections (CONNECT = 0) and (2) firms with government connections (CONNECT = 1). We find that the mean value of INNOVATION is 0.5585 and 0.3939 for firms with and without government connections, respectively. The difference between the mean of the INNOVATION variable for the two denoted groups is statistically significant (*p*-value = 0.0000).

Table 4 presents the results of model (1) with industry- and time-fixed effects, with marginal effects reported for ease of interpretation. In column (1), CONNECTION is the only explanatory variable. In column (2), we include all control variables except CONNECTION. In the third (fourth) column, we utilize CONNECTION and firm-level (country-level) control variables.

Observing the results from column (2), we find that larger firms are more likely to have innovative activities, consistent with prior studies by Marom *et al.* (2019), Bhattacharya and Bloch (2004), Qi and Ongena (2019) and Nguyen *et al.* (2022b). Next, consistent with Park (2018), we find that firms with audited statements (i.e. those that are more transparent in providing information) are more likely to innovate. The estimates show that exporters have a higher probability of introducing innovative activities, in accordance with Bratti and Felice (2012) and Lin and Tang (2013). In addition, we document a negative (positive) relationship between state (foreign) ownership and innovation, in line with Choi *et al.* (2012), Joe *et al.* (2019), Guadalupe *et al.* (2012), Falk (2008) and Corsi and Prencipe (2018).

Moreover, the results indicate that state-owned firms tend to have a lower likelihood of having innovative activities, supporting previous findings by Zhou *et al.* (2016) and Bortolotti *et al.* (2018). Firms operating in countries with a higher level of openness and economic growth have a higher probability of introducing innovation, in line with Khan *et al.* (2024a, b)

Table 1. Definition and source of all variables

Variable	Definition	Source
CONNECTION ^d	Dummy variable which equals 1 if the firm has government contract secured or attempt to secure a government contract in the last 12 months, and zero otherwise	WBES Question j6a
<i>Dependent variable</i>		
INNOVATION ^d	Dummy variable which equals 1 if establishment introduced either new products/services or new process in the past three years, and zero otherwise	WBES Question h1 and h5
INNOVATION_ product ^d	Dummy variable which equals 1 if establishment introduced new products/services in the past three years, and zero otherwise	WBES Question h1
INNOVATION_ process ^d	Dummy variable which equals 1 if establishment introduced new process in the past three years, and zero otherwise	WBES Question h5
<i>Control variables</i>		
LNAGE	Natural logarithm of a firm's age. Age equals year of survey minus year a firm began operations	WBES Question b5
LNSIZE	Natural logarithm of a firm's size. Size is measured by number of permanent, full-time employees	WBES Question l1
AUDIT ^d	Dummy variable. It equals 1 if a firm's financial statements are checked and certified by external auditor, and zero otherwise	WBES Question k21
PROPRIETORSHIP ^d	Dummy variable which equals 1 if legal status of the firm is sole proprietorship, and zero otherwise	WBES Question b1
LISTED ^d	Dummy variable which equals 1 if legal status of the firm is shareholding company with shares traded in the stock market, and zero otherwise	WBES Question b1
EXPORTER ^d	Dummy variable. It equals 1 if $\geq 10\%$ of total sales are from exporting activities and zero otherwise	WBES Question d3b
FOREIGN ^d	Dummy variable = 1 if $\geq 50\%$ of the firm owned by private foreign individuals, companies or organizations, and zero otherwise	WBES Question b2c
STATE_OWNED ^d	Dummy variable = 1 if $\geq 50\%$ of the firm owned by government/ state and zero otherwise	WBES Question b2b
TIMESPENT	Percentage of senior management time was spent in dealing with government regulations	WBES Question j2
TRADE	The sum of imports and exports of goods and services as a share of GDP	WDI
INFLATION	Inflation measured by the annual change in consumer prices	WDI
GROWTH	Annual growth rate of GDP	WDI
R&D ^d	Dummy variable which equals 1 if the firm spent on research and development (excluding market research) during the last fiscal year, and zero otherwise	WBES Question h8
ACCESS ^d	Dummy variable which equals 1 if the firm has access to finance (i.e. the firm applied and got bank loan approval), and zero otherwise (i.e. the firm was either rejected or discouraged from applying bank loans)	WBES Questions k16, k17, and k20a
CORRUPTION	Values of the Transparency International's Corruption Perceptions Index; Lower values indicate higher levels of corruption	Transparency International
MARKET POWER	Bank concentration ration, measured as the share of the three largest banks' assets relative to the total assets of all banks	Global Financial Development Database

Note(s) ^dDenotes dummy variable

This table illustrates the definition and source of all variables utilized in this study. WBES: World Bank Enterprise Surveys; WDI: World Development Indicators

Source(s): Table created by authors

Table 2. Descriptive statistics

Variable	Obs.	Mean	SD	P25	Median	P75
INNOVATION ^d	103,883	0.4207	0.4937	0	0	1
INNOVATION_product ^d	103,883	0.3189	0.4660	0	0	1
INNOVATION_process ^d	103,883	0.2935	0.4554	0	0	1
CONNECTION	103,883	0.1625	0.3689	0	0	0
LNAGE	103,883	2.7381	0.8047	2.3026	2.8332	3.2581
LNSIZE	103,883	3.2831	1.3653	2.1972	2.9957	4.1744
AUDIT ^d	103,883	0.5443	0.4980	0	1	1
PROPRIETORSHIP ^d	103,883	0.3183	0.4658	0	0	1
LISTED ^d	103,883	0.0485	0.2149	0	0	0
EXPORTER ^d	103,883	0.2177	0.4127	0	0	0
FOREIGN ^d	103,883	0.0621	0.2414	0	0	0
STATE_OWNED ^d	103,883	0.0054	0.0734	0	0	0
TIMESPENT	97,318	10.3981	19.1603	0	2	10
TRADE	103,883	0.7259	0.3948	0.4827	0.5988	0.8916
INFLATION	103,883	0.0507	0.0456	0.0188	0.0491	0.0670
GROWTH	103,883	0.0429	0.0339	0.0266	0.0435	0.0724
R&D ^d	103,883	0.1668	0.3728	0	0	0
ACCESS ^d	47,210	0.3854	0.4867	0	0	1
CORRUPTION	100,703	41.4426	15.2670	32	38	45
MARKET POWER	90,972	0.5753	0.2001	0.4238	0.5732	0.6845

Note(s) ^dDenotes dummy variable

This table presents the descriptive statistics of all variables used in this study. The definition and source of all variables are shown in [Table 1](#)

Source(s): Table created by authors

and [Shu and Steinwender \(2018\)](#). Overall, the coefficients for these firm and country characteristics align with existing evidence in the literature related to the drivers of innovation.

The estimates for CONNECTION are positive and significant in columns (1) to (5) with or without controls. Moreover, the estimates of controls are similar to those in column (2), indicating that the relationship between government connections and innovation is not driven by spurious correlation between other variables. The research evidence suggests a positive association between government connections and innovation. Thus, hypothesis [H1](#) (not [H2](#)) is supported.

Our results differ from [Hou et al. \(2017\)](#), who suggest a negative association between political connections and innovation. The authors suggest that politically connected firms might have an issue of over-investment and focus extensively on short-term production instead of a long-term vision of innovation. Moreover, political investment is costly and might squeeze the necessary resources for R&D or innovation ([Chen et al., 2005](#); [Hou et al., 2017](#)). This negative association aligns with the “know-who” channel, describing the case in which a firm may use political advantages to pursue private benefits ([Qi and Nguyen, 2020](#)). The negative association between government connections and innovation might exist in countries with weak institutional development.

Our finding supports findings in [Tsai et al. \(2019\)](#), who note that firms with government connections are well-informed about various policies and essential information related to innovative activities. In turn, the information acquired can support the introduction of innovation. The result is in accordance with the “know-how” view demonstrated by [Qi and Nguyen \(2020\)](#). Specifically, close ties with government entities give firms more information about the inner workings and processes, whereby such superior knowledge ultimately influences firm outcomes ([Michelson, 2006](#)), such as investment decisions. Further, the connections might facilitate access to resources, which foster innovation since innovation requires substantial investment in physical and intangible assets ([Porter, 1992](#); [Shane and Ulrich, 2004](#)).

Table 3. Correlation matrix

	A	B	C	D	E	F	G	H	I	K	L	M
A INNOVATION ^d	1											
B CONNECTION ^d	0.123***	1										
C LNAGE	0.047***	0.033***	1									
D LNSIZE	0.117***	0.082***	0.244***	1								
E AUDIT ^d	0.159***	0.087***	0.155***	0.252***	1							
F PROPRIETORSHIP ^d	−0.099***	−0.097***	−0.080***	−0.210***	−0.062***	1						
G LISTED ^d	0.027***	0.052***	0.099***	0.171***	0.063***	−0.154***	1					
H EXPORTER ^d	0.145***	0.012***	0.138***	0.286***	0.119***	−0.166***	0.077***	1				
I FOREIGN ^d	0.092***	0.009***	−0.010***	0.148***	0.093***	−0.104***	0.074***	0.176***	1			
J STATE_OWNED ^d	−0.009***	0.032***	0.033***	0.086***	0.025***	−0.048***	0.120***	0.002	−0.016***	1		
K TRADE	0.083***	0.031***	0.053***	−0.062***	−0.060***	−0.197***	0.058***	0.140***	0.096***	0.015***	1	
L INFLATION	−0.075***	−0.003	−0.098***	0.032***	0.023***	0.132***	−0.044***	−0.098***	−0.070***	0.036***	−0.364***	1
M GROWTH	0.020***	0.020***	−0.088***	0.070***	0.058***	0.220***	−0.057***	−0.117***	−0.071***	0.015***	−0.209***	0.263***

Note(s) ^dDenotes dummy variable

This table shows the correlation matrix of all variables engaged in the model. The definition and source of all variables are shown in [Table 1](#). Asterisks indicate significance at 10% (*), 5% (**), and 1% (***), respectively

Source(s): Table created by authors

Table 4. The relationship between government connections and innovation

Dependent variable	INNOVATION (1)	INNOVATION (2)	INNOVATION (3)	INNOVATION (4)	INNOVATION (5)
<i>CONNECTION</i> ^d	0.1335*** (0.0063)		0.1124*** (0.0062)	0.1303*** (0.0060)	0.1104*** (0.0060)
LNAGE		0.0052* (0.0028)	0.0064** (0.0031)		0.0039 (0.0028)
LNSIZE		0.0248*** (0.0022)	0.0212*** (0.0023)		0.0230*** (0.0022)
AUDIT ^d		0.0897*** (0.0068)	0.0838*** (0.0074)		0.0834*** (0.0068)
PROPRIETORSHIP ^d		−0.0110 (0.0079)	−0.0128 (0.0086)		−0.0049 (0.0079)
LISTED ^d		0.0093 (0.0104)	0.0091 (0.0104)		0.0049 (0.0103)
EXPORTER ^d		0.0953*** (0.0067)	0.1043*** (0.0071)		0.0970*** (0.0066)
FOREIGN ^d		0.0538*** (0.0087)	0.0625*** (0.0088)		0.0573*** (0.0086)
STATE_OWNED ^d		−0.1317*** (0.0226)	−0.1373*** (0.0223)		−0.1402*** (0.0220)
TRADE		0.0949*** (0.0203)		0.1076*** (0.0208)	0.0935*** (0.0200)
INFLATION		−0.2410* (0.1331)		−0.2834** (0.1361)	−0.2433* (0.1318)
GROWTH		0.6193** (0.2808)		0.5674* (0.2969)	0.5841** (0.2779)
Observations	103,883	103,883	103,883	103,883	103,883
Pseudo R-squared	0.139	0.164	0.165	0.146	0.171
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes

Note(s) ^dDenotes dummy variable

This table presents the result (marginal effects) of model (1) using Probit regression technique with industry and time fixed effects. The dependent variable is INNOVATION, while the key independent variable is CONNECTION. The description and source of all variables are presented in Table 1. In the first column, CONNECTION is the only explanatory variable. In column (2), we include all controls except CONNECTION. In column (3), CONNECTION and other firm-level controls are included, while in column (4), CONNECTION and country-level variables are employed. The last column present the estimates of the full model. Standard errors double clustered at the industry-country level are in parentheses. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***), respectively

Source(s): Table created by authors

4.3 Sensitivity tests

Internet Appendix IA.4 illustrates a battery of sensitivity tests to confirm the positive association between government connections and firm innovation. In the first two columns of Panel A, we disaggregate innovative activities into (1) the introduction of products/services (INNOVATION_pd) and (2) the introduction/significant improvement of a new process (INNOVATION_pc). The estimates for the CONNECTION variable are positive and significant at the 1% level, indicating that having close ties with the government is associated with an increased likelihood of having innovative activities.

Next, we employ alternative estimation techniques. Specifically, in column (3), we include industry-, year- and country-fixed effects. The inclusion of country-fixed effects accounts for some time-invariant country traits that influence innovation, such as culture (Tian *et al.*, 2018) or language (Kong *et al.*, 2021). In column (4), we utilize time-varying industry FE, which accounts for all time-variant industry traits that might affect innovation, such as market

competition ([Aghion et al., 2005](#)). In column (5), time-varying country FE is used to consider all time-variant country characteristics that we cannot include in the baseline model. The estimated coefficients of CONNECTION are all positive and significant at the 1% level, confirming the main findings of our study.

Next, in Panel B, we attempt to use alternative sample selection criteria. Specifically, we estimate model (1) for each year, from 2011 to 2022, with industry-fixed effects. Next, in column (1) of Panel C, we drop firms in countries with fewer than 300 observations (column 1). In columns (2) and (3), we drop countries with more than 5,000 observations and firms operating in India from the sample to allay the concerns that the result is driven by a large number of firms in some countries. The coefficients of CONNECTION are all positive and significant, meaning that the positive association between government connections and innovation is statistically validated.

In [Internet Appendix IA.5](#), we also present the results for (1) small firms (<20 employees), (2) medium firms (20–99 employees), (3) large firms (>100 employees) and (4) small and medium-sized firms. The results demonstrate that the estimated coefficients of INNOVATION are all positive and significant for all sub-samples.

Following relevant studies ([Hoang Vu et al., 2021](#); [Vu et al., 2022](#)), we apply two-stage least squares (2SLS) regressions with an instrumental variable to tackle the possible endogeneity issues. For this purpose, we aim to find an appropriate instrument for the CONNECTION variable. [Krammer and Jiménez \(2020\)](#) consider that firms can enhance political connections with the government when they invest in the relationship (in a non-monetary way). In other words, spending more time interacting with government entities will improve the connections between firms and the government ([Krammer and Jiménez, 2020](#)).

Thus, we use the percentage of senior management time spent (TIMESPENT) on dealing with government regulations/requirements as an instrumental variable (question j2 in WBES). TIMESPENT has a mean of 10.4%, varying from zero to 100%. We expect a positive association between time spent dealing with government requirements and government connections.

[Internet Appendix IA.6](#) presents the estimations of the 2SLS regressions with an instrumental variable. As expected, the result from the first stage (column 1) shows that senior management time spent is positively associated with the likelihood of having government connections. Importantly, the result from the second stage (column 2) shows that INNOVATION increases with CONNECTION.

Since we employ robust standard errors double clustered at the industry-year level, traditional post-estimation checks such as the [Cragg and Donald \(2009\)](#) test are not applicable. Hence, following [Nguyen and Dang \(2022\)](#), we use the Montiel-Pflueger robust weak instrument test proposed by [Olea and Pflueger \(2013\)](#). The statistics at the bottom of [Internet Appendix IA.6](#) show that the effective F-statistic is 90.327, which is higher than the critical value and exceeds 10, confirming that our instrument is not weak.

While we can handle the issue of omitted country-level (industry-level) variables by using time-varying country- (industry-) fixed effects, omitted firm-level characteristics remain a potential issue. Following [Qi and Nguyen \(2020\)](#), we use the propensity score matching (PSM) technique in the following analysis.

Specifically, we use a probit model to estimate the probability that a firm has government connections (all firm-level characteristics are included). We then conduct a one-to-one propensity score-matched sample of firms with connections to those without using the nearest neighbor matching setting (1:1), presenting the comparison of treated and control groups in Panel A of [Internet Appendix IA.7](#). The mean values of key firm characteristics between the two groups are quite small, indicating that the matching process is technically acceptable. Next, in Panel B, we replicate [Table 4](#) using the propensity score-matched sample to observe whether the estimates for CONNECTION are consistent with the main finding. The coefficients for CONNECTION are all positive and significant, confirming the main findings of our study. Importantly, our results are not driven by observable differences between firms with connections and without connections.

4.4 Government connections and innovation: channels

As mentioned in the introduction, we hypothesize that firms with government connections have a higher probability of innovation since they are more likely to invest in R&D activities and have broader access to finance to fund innovation. To proceed, we employ the 2SLS, where the first step examines how having government connections affects the mechanism and the second step explores how the mechanism affects firms' innovation.

We use the following specifications to test the first mechanism (R&D activities):

$$R\&D_{i,j,t} = \alpha_2 + \beta_2 * CONNECTION_{i,j,t} + \gamma_2 * X_{i,j,t} + \varepsilon_{i,j,t} \quad (2)$$

$$INNOVATION_{i,j,t} = \alpha_3 + \omega * R\&D_{i,j,t} + \gamma_3 * X_{i,j,t} + \varepsilon_{i,j,t} \quad (3)$$

where R&D is a dummy equal to one if the firm spent on R&D activities during the past three years and zero otherwise.

Next, the following specifications are used to check the second mechanism (financial access):

$$ACCESS_{i,j,t} = \alpha_4 + \beta_4 * CONNECTION_{i,j,t} + \gamma_4 * X_{i,j,t} + \varepsilon_{i,j,t} \quad (4)$$

$$INNOVATION_{i,j,t} = \alpha_5 + \theta * ACCESS_{i,j,t} + \gamma_5 * X_{i,j,t} + \varepsilon_{i,j,t} \quad (5)$$

We employ three questions from the WBES to construct the ACCESS variable. Specifically, question k16 investigates whether the firm applied for new loans or new lines of credit, while question k20a asks about the outcome of the application. Moreover, question k17 is used to collect information about discouraged borrowers, asking the reason for not applying for new loans or credit lines [4].

Table 5 displays the results of our tests. We find that having government connections is associated with a higher likelihood of having R&D investment (column 1). Moreover, innovation increases with R&D investment (column 2). Next, we observe that firms with government connections have a higher likelihood of having financial access than firms without such connections (column 3). In addition, financial access is positively associated with innovation (column 4).

We also conduct an additional test to validate the mechanism using the path analysis, in which we incorporate CONNECTION into the specifications. Specifically, we employ the following models:

$$R\&D_{i,j,t} = \alpha_2 + \beta_2 * CONNECTION_{i,j,t} + \gamma_2 * X_{i,j,t} + \varepsilon_{i,j,t} \quad (6)$$

$$INNOVATION_{i,j,t} = \alpha_3 + \beta_3 * CONNECTION_{i,j,t} + \omega * R\&D_{i,j,t} + \gamma_3 * X_{i,j,t} + \varepsilon_{i,j,t} \quad (7)$$

and

$$ACCESS_{i,j,t} = \alpha_4 + \beta_4 * CONNECTION_{i,j,t} + \gamma_4 * X_{i,j,t} + \varepsilon_{i,j,t} \quad (8)$$

$$INNOVATION_{i,j,t} = \alpha_5 + \beta_5 * CONNECTION_{i,j,t} + \theta * ACCESS_{i,j,t} + \gamma_5 * X_{i,j,t} + \varepsilon_{i,j,t} \quad (9)$$

The results show that having government connections is associated with a higher likelihood of having R&D investment (column 5) and innovation increases with R&D investment (column 6). Next, we observe that firms with government connections have a higher likelihood of financial access compared to firms without such connections (column 7). In addition, financial access is found to be positively associated with innovation (column 8). Overall, the analysis validates the two channels that we test.

Table 5. Testing the channels

Dependent variable	R&D (1)	INNOVATION (2)	ACCESS (3)	INNOVATION (4)	R&D (5)	INNOVATION (6)	ACCESS (7)	INNOVATION (8)
<i>CONNECTION^d</i>	0.0738*** (0.0030)		0.0763*** (0.0051)		0.0658*** (0.0044)	0.0854*** (0.0060)	0.0711*** (0.0069)	0.0950*** (0.0077)
R&D ^d		1.5605*** (0.0697)				0.3191*** (0.0080)		
ACCESS ^d				1.3719*** (0.1107)				0.0920*** (0.0077)
LNAGE	−0.0020 (0.0015)	0.0074*** (0.0025)	0.0177*** (0.0027)	−0.0220*** (0.0049)	−0.0037* (0.0020)	0.0046* (0.0025)	0.0169*** (0.0039)	0.0005 (0.0037)
LNSIZE	0.0313*** (0.0009)	−0.0250*** (0.0028)	0.0546*** (0.0017)	−0.0461*** (0.0068)	0.0288*** (0.0014)	0.0127*** (0.0020)	0.0511*** (0.0031)	0.0227*** (0.0028)
AUDIT ^d	0.0683*** (0.0024)	−0.0194*** (0.0065)	0.1103*** (0.0044)	−0.0651*** (0.0146)	0.0709*** (0.0044)	0.0595*** (0.0061)	0.1044*** (0.0075)	0.0704*** (0.0076)
PROPRIETORSHIP ^d	−0.0143*** (0.0026)	0.0208*** (0.0047)	−0.0574*** (0.0048)	0.0659*** (0.0104)	−0.0207*** (0.0054)	0.0000 (0.0076)	−0.0605*** (0.0087)	−0.0097 (0.0092)
LISTED ^d	0.0147*** (0.0052)	−0.0183** (0.0090)	−0.0009 (0.0097)	−0.0011 (0.0159)	0.0064 (0.0070)	0.0010 (0.0094)	−0.0045 (0.0121)	−0.0033 (0.0125)
EXPORTER ^d	0.1125*** (0.0029)	−0.0725*** (0.0092)	0.0870*** (0.0052)	−0.0286** (0.0128)	0.0884*** (0.0041)	0.0618*** (0.0061)	0.0777*** (0.0069)	0.0804*** (0.0082)
FOREIGN ^d	0.0158*** (0.0046)	0.0421*** (0.0081)	−0.0476*** (0.0093)	0.1128*** (0.0162)	0.0066 (0.0053)	0.0534*** (0.0081)	−0.0504*** (0.0123)	0.0471*** (0.0114)
STATE_OWNED ^d	−0.0565*** (0.0148)	−0.0583** (0.0259)	−0.0297 (0.0290)	−0.0475 (0.0478)	−0.0557*** (0.0171)	−0.1211*** (0.0193)	−0.0344 (0.0285)	−0.0830*** (0.0300)
TRADE	0.0262*** (0.0034)	0.7411*** (0.0804)	0.1802*** (0.0069)	1.0087*** (0.1408)	0.0246** (0.0106)	0.0846*** (0.0180)	0.1533*** (0.0204)	0.0607*** (0.0199)
INFLATION	−0.2187*** (0.0278)	0.0652*** (0.0063)	−0.3788*** (0.0503)	−0.1597*** (0.0230)	−0.1888** (0.0897)	−0.1732 (0.1161)	−0.4209** (0.1651)	−0.1480 (0.1558)
GROWTH	−0.0699 (0.0464)	0.0871* (0.0504)	−0.0294 (0.0857)	0.3267*** (0.0927)	−0.0985 (0.1520)	0.6086** (0.2517)	0.0264 (0.2067)	0.8970*** (0.2670)
Observations	103,883	103,883	47,210	47,210	103,883	103,883	47,210	47,210
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note(s) ^dDenotes dummy variable

This table presents the estimates using the 2SLS with industry and time fixed effects (column 1 to 4) and path analysis (column 5 to 8). Marginal effects are reported for the path analysis. The description and source of all variables are shown in Table 1. Standard errors double clustered at the country-industry level are in parentheses. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***)

Source(s): Table created by authors

4.5 The moderating impacts of corruption and bank market power

In this section, we test whether country characteristics moderate the relationship between government connections and innovation. As previously mentioned, we consider country-level corruption as a potential moderator. Following relevant studies (Brockman *et al.*, 2013; Qi and Nguyen, 2020), we use the Transparency International's Corruption Perceptions Index (CORRUPTION) to indicate country-level corruption. CORRUPTION ranges from zero to 100 and smaller values suggest higher levels of corruption. Next, following Han *et al.* (2009), Mac an Bhaird *et al.* (2016) and Nguyen *et al.* (2022a), we use bank concentration ratio (MARKET POWER) measured as the share of the three largest banks' assets relative to the total assets of all banks to indicate bank market power.

Table 6 presents the results. The estimate of the interaction term between government connections and country-level corruption is statistically insignificant. Thus, we cannot conclude that country-level corruption moderates the relationship between government connections and innovation. In other words, hypothesis H3 is not supported.

This result, however, can be understood since our sample contains small businesses. In this case, it is less likely that their managers are working with top governmental agencies, as in studies by Hou *et al.* (2017) or Bao *et al.* (2016). Thus, the issue of over-investment due to favorable treats associated with corruption may not be severe. In addition, firms mostly innovate in products/services and processes which do not require complicated licenses or applications (as for patent or invention), in which bribery is likely to occur. Thus, the influence of bribery or extortion associated with corruption may not be the case.

Next, the result in column (2) shows that the coefficient of the interaction term between government connections and concentration ratio is positive and significant. Thus, it is found that the impact of government connections on innovative activities is stronger in countries with higher bank market power (i.e. higher values of MARKET POWER variable). H4 thus is supported.

The result raises the important of banking structure in moderating the government connections–innovation nexus and it is explainable. Small businesses rely extensively on debt financing rather than equity financing when compared to large corporations (Chen *et al.*, 2011; Daskalakis *et al.*, 2013; Wang *et al.*, 2023). Therefore, bank market power will be a strong moderator since it positively alters firms access to credit as proven in existing theories (Petersen and Rajan, 1995) or empirical studies, such as Han *et al.* (2009), Mac an Bhaird *et al.* (2016) and Nguyen *et al.* (2022a).

5. Discussion

Prior studies have demonstrated that innovation might enhance firm performance and growth, reduce default risks and ensure competitive advantages over competitors (Artz *et al.*, 2010; Blundell *et al.*, 1999; Hirshleifer *et al.*, 2013; Hsu *et al.*, 2015; Sorescu and Spanjol, 2008). Due to such essential roles, a rich body of literature has devoted itself to exploring the drivers of innovation, spanning from firm-level factors to country-level characteristics (Bhattacharya and Bloch, 2004; He and Tian, 2018, 2020; Qi and Ongena, 2019; Tian *et al.*, 2018). Nevertheless, little is known about the roles of political or government connections in innovation, especially for small businesses and unlisted firms. In addition, the competing findings in this strand of literature together with the unclear mechanisms through which government connections influence innovation call for more research.

This study has explored whether firms with government connections are more or less likely to introduce innovative activities. Using a global sample containing more than 100,000 observations in 122 countries, we document a positive relationship between government connections and innovation. This positive association is confirmed when using alternative innovative measures and different econometric approaches.

Furthermore, we explore two channels through which government connections are favorable for corporate innovation. First, politically connected firms should be informed more

Table 6. Moderating effects

Dependent variable	INNOVATION (1)	INNOVATION (2)
<i>CONNECTION</i> ^d	0.1205*** (7.5834)	0.0639*** (2.6779)
CORRUPTION	0.0031*** (4.6532)	
CONNECTION * CORRUPTION	−0.0003 (−0.9049)	
MARKET POWER		0.0429 (0.9916)
CONNECTION * MARKET POWER		0.0911** (2.4182)
LNAGE	0.0002 (0.0755)	0.0051 (1.5780)
LNSIZE	0.0243*** (10.9262)	0.0263*** (10.2922)
AUDIT ^d	0.0766*** (10.9947)	0.0938*** (12.2777)
PROPRIETORSHIP ^d	−0.0006 (−0.0760)	−0.0043 (−0.4839)
LISTED ^d	0.0067 (0.6828)	0.0065 (0.5696)
EXPORTER ^d	0.0897*** (13.4100)	0.0956*** (13.4449)
FOREIGN ^d	0.0562*** (6.5383)	0.0596*** (6.2528)
STATE_OWNED ^d	−0.1376*** (−6.1214)	−0.1646*** (−6.8841)
TRADE	0.0561*** (2.8975)	0.1001*** (4.6632)
INFLATION	−0.0814 (−0.4001)	−0.2678 (−1.5489)
GROWTH	0.7943*** (3.0339)	0.7051** (2.2871)
Observations	100,703	90,972
Pseudo <i>R</i> -squared	0.174	0.128
Industry fixed effects	Yes	Yes
Time fixed effects	Yes	Yes

Note(s) ^dDenotes dummy variable

This table presents the results of the additional test for moderating effects. In column (1) we include the interaction between government connections (CONNECTION) and country-level corruption (CORRUPTION). In column (2), we employ the interaction between government connections and bank market power (CR). The description and source of all variables are shown in Table 1. Standard errors double clustered at the country-industry level are in parentheses. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***)

Source(s): Table created by authors

about government policies that might affect innovation performance so that they can allocate their resources efficiently for innovative activities or be more confident in R&D investments. Second, having political connections enables firms to have broader access to external finance (e.g. bank loans), whereby they have more resources for innovation. The results show that small businesses with government connections are more likely to invest in R&D and have financial access, which in turn are positively associated with innovative activities.

Further, the mixed findings in prior studies could be explained by moderating impacts of country-level characteristics. We consider bank market power and corruption can explain such

heterogeneity in the relationship between government connections and innovation. We find that the impact of government connections on innovation is stronger in countries with higher levels of bank market power. Such result supports the notion that small businesses tend to rely extensively on bank credit (Chen *et al.*, 2011; Daskalakis *et al.*, 2013; Wang *et al.*, 2023) and bank market power positively increases access to finance (Petersen and Rajan, 1995). Some studied the impacts of bank market power/competition on various facets of firm operation (e.g. Jiang *et al.*, 2020). We also add that bank market power also provide potential moderating effects on the government connections–innovation nexus, thereby providing meaningful theoretical contribution to the recent literature in the banking and finance field.

This research holds practical implications for various stakeholders such as firm managers, policymakers and financial institutions. Specifically, we highlight the role of government connections in facilitating access to finance and encouraging R&D investment, which is critical for small business innovation. The findings also indicate that policymakers should facilitate access to government contracts and support mechanisms that enhance R&D investment. The results suggest that firms, especially small businesses, may have difficulties once the connections with government are lost. In this case, they need broader access to financial services and operate more efficiently to have sufficient funds for R&D activities. Several approaches stated by the existing literature, such as enhancing transparency (Cole and Frost, 2018), improving employee satisfaction and commitment (Chen *et al.*, 2016), could be considered.

Our study cannot avoid some shortcomings. First, due to data limitations, we cannot employ alternative measures of government connections. Specifically, studies focusing on the Chinese market (Bao *et al.*, 2016; Hou *et al.*, 2017; Liu *et al.*, 2021) employ multiple indicators to measure political connections. However, such data are not available in the WBES, preventing us from testing alternative measures for government connections. Second, since the data sample is not panel data, we are unable to conduct rigorous analysis such as the difference-in-difference technique.

Author contributions statement

Hau Trung Nguyen: Conceptualization, Writing- Original draft preparation, Methodology;
Thuy T. Dang: Writing- Reviewing and Editing, Methodology;
Duc Nguyen Nguyen: Writing- Original draft preparation, Writing- Reviewing and Editing;
Quang Thai Truong: Software, Writing- Reviewing and Editing.

Data availability statement

The data that support the findings of this study are publicly provided by the World Bank at [<https://www.enterprisesurveys.org/en/enterprisesurveys>] and [<https://databank.worldbank.org/source/world-development-indicators>].

Acknowledgments

This research is funded by Vietnam National Foundation for Science and Technology Development (NAFOSTED) under grant number 502.02-2021-17. Duc Nguyen dedicates this article to his two sons (Bond and Pi). We thank the editor and three anonymous reviewers for providing insightful comments and feedback.

Notes

1. For a review of the role of innovation on sustainable development, see Dzhenushalieva and Teuber (2024). Roles of innovation in achieving the Sustainable Development Goals: A bibliometric analysis. *Journal of Innovation and Knowledge*, 9(2), 100,472. <https://doi.org/https://doi.org/10.1016/j.jik.2024.100472>

2. In our sample, 80% of firms are categorized as SMEs, and only 4.8% of them are listed on a stock exchange. Thus, our data adequately represents small businesses.
3. For more details, see <https://www.econlib.org/library/Enc/Innovation.html>
4. There are seven mutually exclusive options to answer question k17: (1) no need for a loan - establishment had sufficient funds; (2) application procedures were complex; (3) interest rates were not favorable; (4) collateral requirements were too high; (5) size of loan and maturity were insufficient; (6) did not think it would be approved; and (7) other. Discouraged borrowers did not apply due to a reason from (2) to (7).

Supplementary material

The supplementary material for this article can be found online.

References

- Acs, Z.J. and Virgill, N. (2010), "Entrepreneurship in developing countries", in Acs, Z.J. and Audretsch, D.B. (Eds), *Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction*, Springer, New York, pp. 485-515, doi: [10.1007/978-1-4419-1191-9_18](https://doi.org/10.1007/978-1-4419-1191-9_18).
- Afuah, A. (2003), *Innovation Management*, Oxford University Press, Oxford.
- Aghion, P. and Howitt, P. (1992), "A model of growth through creative destruction", *Econometrica*, Vol. 60, pp. 323-351.
- Aghion, P., Bloom, N., Blundell, R., Griffith, R. and Howitt, P. (2005), "Competition and innovation: an inverted-U relationship", *Quarterly Journal of Economics*, Vol. 120 No. 2, pp. 701-728, doi: [10.1093/qje/120.2.701](https://doi.org/10.1093/qje/120.2.701).
- Agoraki, K.K., Deirmentzoglou, G.A., Psychalis, M. and Apostolopoulos, S. (2023), "Types of innovation and sustainable development: evidence from medium- and large-sized firms", *International Journal of Innovation and Technology Management*, Vol. 21 No. 02, 2450013, doi: [10.1142/S0219877024500135](https://doi.org/10.1142/S0219877024500135).
- Andrade Rocha, L., Querido Cardenas, L., Alves Reis, F., Galve Araújo Silva, N. and Alano Soares De Almeida, C. (2021), "Inflation and innovation value: how inflation affects innovation and the value strategy across firms", *Estudios Económicos*, Vol. 38 No. 76, pp. 147-195.
- Anokhin, S. and Schulze, W.S. (2009), "Entrepreneurship, innovation, and corruption", *Journal of Business Venturing*, Vol. 24 No. 5, pp. 465-476, doi: [10.1016/j.jbusvent.2008.06.001](https://doi.org/10.1016/j.jbusvent.2008.06.001).
- Artz, K.W., Norman, P.M., Hatfield, D.E. and Cardinal, L.B. (2010), "A longitudinal study of the impact of R&D, patents, and product innovation on firm performance", *Journal of Product Innovation Management*, Vol. 27 No. 5, pp. 725-740.
- Bao, X., Johan, S. and Kutsuna, K. (2016), "Do political connections matter in accessing capital markets? Evidence from China", *Emerging Markets Review*, Vol. 29, pp. 24-41, doi: [10.1016/j.ememar.2016.08.009](https://doi.org/10.1016/j.ememar.2016.08.009).
- Beck, T. (2013), "Bank financing for SMEs – lessons from the literature", *National Institute Economic Review*, Vol. 225 No. 1, pp. R23-R38, doi: [10.1177/002795011322500105](https://doi.org/10.1177/002795011322500105).
- Bhattacharya, M. and Bloch, H. (2004), "Determinants of innovation", *Small Business Economics*, Vol. 22 No. 2, pp. 155-162.
- Bigliardi, B., Ferraro, G., Filippelli, S. and Galati, F. (2020), "The influence of open innovation on firm performance", *International Journal of Engineering Business Management*, Vol. 12, doi: [10.1177/1847979020969545](https://doi.org/10.1177/1847979020969545).
- Blundell, R., Griffith, R. and Van Reenen, J. (1999), "Market share, market value and innovation in a panel of British manufacturing firms", *The Review of Economic Studies*, Vol. 66 No. 3, pp. 529-554.
- Boot, A.W.A. and Thakor, A.V. (2000), "Can relationship banking survive competition?", *The Journal of Finance*, Vol. 55 No. 2, pp. 679-713, doi: [10.1111/0022-1082.00223](https://doi.org/10.1111/0022-1082.00223).

- Bortolotti, B., Veljko, F. and Brian, W. (2018), "Innovation at state-owned enterprises", BAFFI Centre on Economics, Finance and Regulation, available at: <https://baffi.unibocconi.eu/sites/default/files/media/attach/Innovation-at-SOEs.pdf>
- Boubakri, N., Cosset, J.C. and Saffar, W. (2008), "Political connections of newly privatized firms", *Journal of Corporate Finance*, Vol. 14 No. 5, pp. 654-673, doi: [10.1016/j.jcorpfin.2008.08.003](https://doi.org/10.1016/j.jcorpfin.2008.08.003).
- Bratti, M. and Felice, G. (2012), "Are exporters more likely to introduce product innovations?", *The World Economy*, Vol. 35 No. 11, pp. 1559-1598, doi: [10.1111/j.1467-9701.2012.01453.x](https://doi.org/10.1111/j.1467-9701.2012.01453.x).
- Brockman, P., Rui, O.M. and Zou, H. (2013), "Institutions and the performance of politically connected M&As", *Journal of International Business Studies*, Vol. 44 No. 8, pp. 833-852, doi: [10.1057/jibs.2013.37](https://doi.org/10.1057/jibs.2013.37).
- Brown, J.R., Martinsson, G. and Petersen, B.C. (2012), "Do financing constraints matter for R&D?", *European Economic Review*, Vol. 56 No. 8, pp. 1512-1529.
- Chen, C., Li, Z. and Su, X. (2005), "Rent seeking incentives, political connections and organizational structure: empirical evidence from listed family firms in China", City University of Hong Kong Working Paper 1, pp. 22-29.
- Chen, C., Chen, Y., Hsu, P.H. and Podolski, E.J. (2016), "Be nice to your innovators: employee treatment and corporate innovation performance", *Journal of Corporate Finance*, Vol. 39, pp. 78-98, doi: [10.1016/j.jcorpfin.2016.06.001](https://doi.org/10.1016/j.jcorpfin.2016.06.001).
- Chen, S., Sun, Z., Tang, S. and Wu, D. (2011), "Government intervention and investment efficiency: evidence from China", *Journal of Corporate Finance*, Vol. 17 No. 2, pp. 259-271, doi: [10.1016/j.jcorpfin.2010.08.004](https://doi.org/10.1016/j.jcorpfin.2010.08.004).
- Choi, S.B., Park, B.I. and Hong, P. (2012), "Does ownership structure matter for firm technological innovation performance? The case of Korean firms", *Corporate Governance: An International Review*, Vol. 20 No. 3, pp. 267-288, doi: [10.1111/j.1467-8683.2012.00911.x](https://doi.org/10.1111/j.1467-8683.2012.00911.x).
- Chu, A.C., Cozzi, G., Lai, C.C. and Liao, C.H. (2015), "Inflation, R&D and growth in an open economy", *Journal of International Economics*, Vol. 96 No. 2, pp. 360-374, doi: [10.1016/j.jinteco.2015.03.007](https://doi.org/10.1016/j.jinteco.2015.03.007).
- Cohen, J., Krishnamoorthy, G. and Wright, A. (2004), "The corporate governance mosaic and financial reporting quality", *Journal of Accounting Literature*, Vol. 23, p. 87.
- Cole, R.A. and Frost, T. (2018), "The role of financial reporting quality in worldwide access to credit", SSRN 3292551.
- Corsi, C. and Prencipe, A. (2018), "Foreign ownership and innovation in independent SMEs. A cross-European analysis", *Journal of Small Business and Entrepreneurship*, Vol. 30 No. 5, pp. 397-430, doi: [10.1080/08276331.2017.1413751](https://doi.org/10.1080/08276331.2017.1413751).
- Cragg, J.G. and Donald, S.G. (2009), "Testing identifiability and specification in instrumental variable models", *Econometric Theory*, Vol. 9 No. 2, pp. 222-240, doi: [10.1017/S0266466600007519](https://doi.org/10.1017/S0266466600007519).
- Cull, R., Li, W., Sun, B. and Xu, L.C. (2015), "Government connections and financial constraints: evidence from a large representative sample of Chinese firms", *Journal of Corporate Finance*, Vol. 32, pp. 271-294, doi: [10.1016/j.jcorpfin.2014.10.012](https://doi.org/10.1016/j.jcorpfin.2014.10.012).
- Daskalakis, N., Jarvis, R. and Schizas, E. (2013), "Financing practices and preferences for micro and small firms", *Journal of Small Business and Enterprise Development*, Vol. 20 No. 1, pp. 80-101, doi: [10.1108/14626001311298420](https://doi.org/10.1108/14626001311298420).
- Dzhunushalieva, G. and Teuber, R. (2024), "Roles of innovation in achieving the sustainable development goals: a bibliometric analysis", *Journal of Innovation and Knowledge*, Vol. 9 No. 2, 100472, doi: [10.1016/j.jik.2024.100472](https://doi.org/10.1016/j.jik.2024.100472).
- Ellis, J., Smith, J. and White, R. (2020), "Corruption and corporate innovation", *Journal of Financial and Quantitative Analysis*, Vol. 55 No. 7, pp. 2124-2149, doi: [10.1017/S0022109019000735](https://doi.org/10.1017/S0022109019000735).
- Faccio, M. (2006), "Politically connected firms", *The American Economic Review*, Vol. 96 No. 1, pp. 369-386, doi: [10.1257/000282806776157704](https://doi.org/10.1257/000282806776157704).
- Faccio, M., Masulis, R.W. and McConnell, J.J. (2006), "Political connections and corporate bailouts", *The Journal of Finance*, Vol. 61 No. 6, pp. 2597-2635, doi: [10.1111/j.1540-6261.2006.01000.x](https://doi.org/10.1111/j.1540-6261.2006.01000.x).

- Falk, M. (2008), "Effects of foreign ownership on innovation activities: empirical evidence for twelve European countries", *National Institute Economic Review*, Vol. 204, pp. 85-97, doi: [10.1177/00279501082040011001](https://doi.org/10.1177/00279501082040011001).
- Francis, J.R., Maydew, E.L. and Sparks, H.C. (1999), "The role of big 6 auditors in the credible reporting of accruals", *Auditing: A Journal of Practice and Theory*, Vol. 18 No. 2, pp. 17-34, doi: [10.2308/aud.1999.18.2.17](https://doi.org/10.2308/aud.1999.18.2.17).
- Fu, J., Shimamoto, D. and Todo, Y. (2017), "Can firms with political connections borrow more than those without? Evidence from firm-level data for Indonesia", *Journal of Asian Economics*, Vol. 52, pp. 45-55, doi: [10.1016/j.asieco.2017.08.003](https://doi.org/10.1016/j.asieco.2017.08.003).
- Guadalupe, M., Kuzmina, O. and Thomas, C. (2012), "Innovation and foreign ownership", *The American Economic Review*, Vol. 102 No. 7, pp. 3594-3627, doi: [10.1257/aer.102.7.3594](https://doi.org/10.1257/aer.102.7.3594).
- Hall, B.H. and Lerner, J. (2010), "The financing of R&D and innovation", in *Handbook of the Economics of Innovation*, Elsevier, Vol. 1, pp. 609-639.
- Han, L., Fraser, S. and Storey, D.J. (2009), "Are good or bad borrowers discouraged from applying for loans? Evidence from US small business credit markets", *Journal of Banking and Finance*, Vol. 33 No. 2, pp. 415-424, doi: [10.1016/j.jbankfin.2008.08.014](https://doi.org/10.1016/j.jbankfin.2008.08.014).
- He, J. and Tian, X. (2018), "Finance and corporate innovation: a survey", *Asia-Pacific Journal of Financial Studies*, Vol. 47 No. 2, pp. 165-212, doi: [10.1111/ajfs.12208](https://doi.org/10.1111/ajfs.12208).
- He, J. and Tian, X. (2020), "Institutions and innovation", *Annual Review of Financial Economics*, Vol. 12 No. 1, pp. 377-398, doi: [10.1146/annurev-financial-032820-083433](https://doi.org/10.1146/annurev-financial-032820-083433).
- Hirshleifer, D., Hsu, P.H. and Li, D. (2013), "Innovative efficiency and stock returns", *Journal of Financial Economics*, Vol. 107 No. 3, pp. 632-654.
- Hoang Vu, N., Anh Bui, T., Minh Nguyen, N. and Hiep Luu, N. (2021), "Local business environment, managerial expertise and tax corruption of small- and medium-sized enterprises", *Baltic Journal of Economics*, Vol. 21 No. 2, pp. 134-157, doi: [10.1080/1406099X.2021.1990473](https://doi.org/10.1080/1406099X.2021.1990473).
- Hope, O.K., Thomas, W. and Vyas, D. (2011), "Financial credibility, ownership, and financing constraints in private firms", *Journal of International Business Studies*, Vol. 42 No. 7, pp. 935-957, doi: [10.1057/jibs.2011.23](https://doi.org/10.1057/jibs.2011.23).
- Hou, Q., Hu, M. and Yuan, Y. (2017), "Corporate innovation and political connections in Chinese listed firms", *Pacific-Basin Finance Journal*, Vol. 46, pp. 158-176, doi: [10.1016/j.pacfin.2017.09.004](https://doi.org/10.1016/j.pacfin.2017.09.004).
- Hsu, P.H., Lee, H.H., Liu, A.Z. and Zhang, Z. (2015), "Corporate innovation, default risk, and bond pricing", *Journal of Corporate Finance*, Vol. 35, pp. 329-344, doi: [10.1016/j.jcorpfin.2015.09.005](https://doi.org/10.1016/j.jcorpfin.2015.09.005).
- Impullitti, G. and Licandro, O. (2018), "Trade, firm selection and innovation: the competition channel", *The Economic Journal*, Vol. 128 No. 608, pp. 189-229, doi: [10.1111/ecoj.12466](https://doi.org/10.1111/ecoj.12466).
- Jiang, T., Levine, R., Lin, C. and Wei, L. (2020), "Bank deregulation and corporate risk", *Journal of Corporate Finance*, Vol. 60, 101520, doi: [10.1016/j.jcorpfin.2019.101520](https://doi.org/10.1016/j.jcorpfin.2019.101520).
- Joe, D.Y., Oh, F.D. and Yoo, H. (2019), "Foreign ownership and firm innovation: evidence from Korea", *Global Economic Review*, Vol. 48 No. 3, pp. 284-302, doi: [10.1080/1226508X.2019.1632729](https://doi.org/10.1080/1226508X.2019.1632729).
- Khan, I., Zhong, R., Khan, H., Dong, Y. and Nuță, F.M. (2024a), "Examining the relationship between technological innovation, economic growth and carbon dioxide emission: dynamic panel data evidence", *Environment, Development and Sustainability*, Vol. 26 No. 7, pp. 18161-18180, doi: [10.1007/s10668-023-03384-w](https://doi.org/10.1007/s10668-023-03384-w).
- Khan, T., Wei, L., Khan, A., Fahlevi, M., Aljuaid, M. and Ali, S. (2024b), "Economic expansion and innovation: a comprehensive analysis of Pakistan's path to technological excellence", *PLoS One*, Vol. 19 No. 4, e0300734, doi: [10.1371/journal.pone.0300734](https://doi.org/10.1371/journal.pone.0300734).
- Khwaja, A.I. and Mian, A. (2005), "Do lenders favor politically connected firms? Rent provision in an emerging financial market", *Quarterly Journal of Economics*, Vol. 120 No. 4, pp. 1371-1411, doi: [10.1162/003355305775097524](https://doi.org/10.1162/003355305775097524).

- Kong, D., Wang, J., Wang, Y. and Zhang, J. (2021), "Language and innovation", *Journal of Business Finance and Accounting*. doi: [10.1111/jbfa.12551](https://doi.org/10.1111/jbfa.12551).
- Krammer, S.M.S. and Jiménez, A. (2020), "Do political connections matter for firm innovation? Evidence from emerging markets in Central Asia and Eastern Europe", *Technological Forecasting and Social Change*, Vol. 151, 119669, doi: [10.1016/j.techfore.2019.05.027](https://doi.org/10.1016/j.techfore.2019.05.027).
- Leon, F. (2015), "Does bank competition alleviate credit constraints in developing countries?", *Journal of Banking and Finance*, Vol. 57, pp. 130-142, doi: [10.1016/j.jbankfin.2015.04.005](https://doi.org/10.1016/j.jbankfin.2015.04.005).
- Li, X. and Jin, Y. (2021), "Do political connections improve corporate performance? Evidence from Chinese listed companies", *Finance Research Letters*, Vol. 41, 101871, doi: [10.1016/j.frl.2020.101871](https://doi.org/10.1016/j.frl.2020.101871).
- Li, H., Meng, L., Wang, Q. and Zhou, L.A. (2008), "Political connections, financing and firm performance: evidence from Chinese private firms", *Journal of Development Economics*, Vol. 87 No. 2, pp. 283-299, doi: [10.1016/j.jdeveco.2007.03.001](https://doi.org/10.1016/j.jdeveco.2007.03.001).
- Lin, F. and Tang, H.C. (2013), "Exporting and innovation: theory and firm-level evidence from the people's Republic of China", Working Papers on Regional Economic Integration 111, Asian Development Bank.
- Liu, S., Du, J., Zhang, W., Tian, X. and Kou, G. (2021), "Innovation quantity or quality? The role of political connections", *Emerging Markets Review*, Vol. 48, 100819, doi: [10.1016/j.ememar.2021.100819](https://doi.org/10.1016/j.ememar.2021.100819).
- Mac an Bhaird, C., Vidal, J.S. and Lucey, B. (2016), "Discouraged borrowers: evidence for Eurozone SMEs", *Journal of International Financial Markets, Institutions and Money*, Vol. 44, pp. 46-55, doi: [10.1016/j.intfin.2016.04.009](https://doi.org/10.1016/j.intfin.2016.04.009).
- Mallik, G., Nguyen, D.N. and Chowdhury, A. (2022), "Does firm size really affect the outcome of loan applications?", *Economic Analysis and Policy*, Vol. 74, pp. 806-820, doi: [10.1016/j.eap.2022.04.004](https://doi.org/10.1016/j.eap.2022.04.004).
- Marini Govigli, V., Rois-Díaz, M., den Herder, M., Bryce, R., Tuomasjukka, D. and Górriz-Mifsud, E. (2022), "The green side of social innovation: using sustainable development goals to classify environmental impacts of rural grassroots initiatives", *Environmental Policy and Governance*, Vol. 32 No. 6, pp. 459-477, doi: [10.1002/eet.2019](https://doi.org/10.1002/eet.2019).
- Marom, S., Lussier, R.N. and Sonfield, M. (2019), "Entrepreneurial strategy: the relationship between firm size and levels of innovation and risk in small businesses", *Journal of Small Business Strategy (Archive Only)*, Vol. 29 No. 3, pp. 33-45.
- Michelson, E. (2006), "Connected contention: social resources and petitioning the state in rural China", SSRN 922104.
- Murphy, K.M., Shleifer, A. and Vishny, R.W. (1993), "Why is rent-seeking so costly to growth?", *The American Economic Review*, Vol. 83 No. 2, pp. 409-414.
- Nguyen, D.N. and Dang, T.T. (2022), "The relationship between central bank independence and systemic fragility: global evidence", *Cogent Economics and Finance*, Vol. 10 No. 1, 2087290, doi: [10.1080/23322039.2022.2087290](https://doi.org/10.1080/23322039.2022.2087290).
- Nguyen, D.N., Mishra, A.V. and Daly, K. (2022a), "Bank market power and discouraged SMEs: International evidence", *Borsa Istanbul Review*. doi: [10.1016/j.bir.2022.07.010](https://doi.org/10.1016/j.bir.2022.07.010).
- Nguyen, D.N., Tran, Q.N. and Truong, Q.T. (2022b), "The ownership concentration – innovation nexus: evidence from SMEs around the world", *Emerging Markets Finance and Trade*, Vol. 58 No. 5, pp. 1288-1307, doi: [10.1080/1540496X.2020.1870954](https://doi.org/10.1080/1540496X.2020.1870954).
- Niessen, A. and Ruenzi, S. (2010), "Political connectedness and firm performance: evidence from Germany", *German Economic Review*, Vol. 11 No. 4, pp. 441-464, doi: [10.1111/j.1468-0475.2009.00482.x](https://doi.org/10.1111/j.1468-0475.2009.00482.x).
- Olea, J.L.M. and Pflueger, C. (2013), "A robust test for weak instruments", *Journal of Business and Economic Statistics*, Vol. 31 No. 3, pp. 358-369, doi: [10.1080/00401706.2013.806694](https://doi.org/10.1080/00401706.2013.806694).
- OECD (2005), *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, OECD, Paris.

- Oliveira-Duarte, L., Reis, D.A., Fleury, A.L., Vasques, R.A., Fonseca Filho, H., Koria, M. and Baruque-Ramos, J. (2021), "Innovation ecosystem framework directed to sustainable development goal #17 partnerships implementation", *Sustainable Development*, Vol. 29 No. 5, pp. 1018-1036, doi: [10.1002/sd.2191](https://doi.org/10.1002/sd.2191).
- Park, K. (2018), "Financial reporting quality and corporate innovation", *Journal of Business Finance and Accounting*, Vol. 45 Nos 7-8, pp. 871-894, doi: [10.1111/jbfa.12317](https://doi.org/10.1111/jbfa.12317).
- Petersen, M.A. and Rajan, R.G. (1995), "The effect of credit market competition on lending relationships", *Quarterly Journal of Economics*, Vol. 110 No. 2, pp. 407-443, doi: [10.2307/2118445](https://doi.org/10.2307/2118445).
- Porter, M.E. (1992), "Capital disadvantage: America's failing capital investment system", *Harvard Business Review*, Vol. 70 No. 5, pp. 65-82, available at: <http://europaepmc.org/abstract/MED/10121317>
- Qi, S. and Nguyen, D.D. (2020), "Government connections and credit access around the world: evidence from discouraged borrowers", *Journal of International Business Studies*, Vol. 52 No. 2, pp. 321-333, doi: [10.1057/s41267-020-00341-x](https://doi.org/10.1057/s41267-020-00341-x).
- Qi, S. and Ongena, S. (2019), "Fuel the engine: bank credit and firm innovation", *Journal of Financial Services Research*, Vol. 57 No. 2, pp. 115-147, doi: [10.1007/s10693-019-00316-6](https://doi.org/10.1007/s10693-019-00316-6).
- Ramzi, T. and Wiem, J. (2019), "Causality nexus between economic growth, inflation and innovation", *Journal of the Knowledge Economy*, Vol. 10 No. 1, pp. 35-58, doi: [10.1007/s13132-016-0432-2](https://doi.org/10.1007/s13132-016-0432-2).
- Romer, P.M. (1990), "Endogenous technological change", *Journal of Political Economy*, Vol. 98 No. 5 Part 2, pp. S71-S102, doi: [10.1086/261725](https://doi.org/10.1086/261725).
- Savignac, F. (2008), "Impact of financial constraints on innovation: what can be learned from a direct measure?", *Economics of Innovation and New Technology*, Vol. 17 No. 6, pp. 553-569.
- Shane, S.A. and Ulrich, K.T. (2004), "50th anniversary article: technological innovation, product development, and entrepreneurship in management science", *Management Science*, Vol. 50 No. 2, pp. 133-144, doi: [10.1287/mnsc.1040.0204](https://doi.org/10.1287/mnsc.1040.0204).
- Shu, P. and Steinwender, C. (2018), "The impact of trade liberalization on firm productivity and innovation", *Innovation Policy and the Economy*, Vol. 19, pp. 39-68, doi: [10.1086/699932](https://doi.org/10.1086/699932).
- Simeth, M. and Cincera, M. (2015), "Corporate science, innovation, and firm value", *Management Science*, Vol. 62 No. 7, pp. 1970-1981, doi: [10.1287/mnsc.2015.2220](https://doi.org/10.1287/mnsc.2015.2220).
- Snihur, Y. and Wiklund, J. (2019), "Searching for innovation: product, process, and business model innovations and search behavior in established firms", *Long Range Planning*, Vol. 52 No. 3, pp. 305-325, doi: [10.1016/j.lrp.2018.05.003](https://doi.org/10.1016/j.lrp.2018.05.003).
- Sorescu, A.B. and Spanjol, J. (2008), "Innovation's effect on firm value and risk: insights from consumer packaged goods", *Journal of Marketing*, Vol. 72 No. 2, pp. 114-132.
- Tian, M., Deng, P., Zhang, Y. and Salmador, M.P. (2018), "How does culture influence innovation? A systematic literature review", *Management Decision*, Vol. 56 No. 5, pp. 1088-1107, doi: [10.1108/MD-05-2017-0462](https://doi.org/10.1108/MD-05-2017-0462).
- Tsai, L.C., Zhang, R. and Zhao, C. (2019), "Political connections, network centrality and firm innovation", *Finance Research Letters*, Vol. 28, pp. 180-184, doi: [10.1016/j.frl.2018.04.016](https://doi.org/10.1016/j.frl.2018.04.016).
- Vu, N.H., Bui, T.A., Hoang, T.B. and Pham, H.M. (2022), "Information technology adoption and integration into global value chains: evidence from small- and medium-sized enterprises in Vietnam", *Journal of International Development*, Vol. 34 No. 2, pp. 259-286, doi: [10.1002/jid.3591](https://doi.org/10.1002/jid.3591).
- Wang, H., Xiang, X. and Han, L. (2023), "Financial development, legal systems and SME finance: cross-country evidence", *International Review of Economics and Finance*, Vol. 88, pp. 981-1002, doi: [10.1016/j.iref.2023.07.021](https://doi.org/10.1016/j.iref.2023.07.021).
- Wooldridge, J.M. (2015), *Introductory Econometrics: A Modern Approach*, Nelson Education, Toronto.
- Wu, J. and Liu Cheng, M. (2011), "The impact of managerial political connections and quality on government subsidies", *Chinese Management Studies*, Vol. 5 No. 2, pp. 207-226, doi: [10.1108/17506141111142834](https://doi.org/10.1108/17506141111142834).

Wu, W., Wu, C., Zhou, C. and Wu, J. (2012), "Political connections, tax benefits and firm performance: evidence from China", *Journal of Accounting and Public Policy*, Vol. 31 No. 3, pp. 277-300, doi: [10.1016/j.jaccpubpol.2011.10.005](https://doi.org/10.1016/j.jaccpubpol.2011.10.005).

Zhou, K.Z., Gao, G.Y. and Zhao, H. (2016), "State ownership and firm innovation in China: an integrated view of institutional and efficiency logics", *Administrative Science Quarterly*, Vol. 62 No. 2, pp. 375-404, doi: [10.1177/0001839216674457](https://doi.org/10.1177/0001839216674457).

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