

Spatial effects of institutional quality on firm performance: evidence from Vietnam

The Nguyen Huynh *

The impact of national institutions on the economy has attracted research attention for decades. However, research on the influence of subnational institutions at the firm level is modest. This paper examines the spatial effects of institutional quality on firm performance using evidence from Vietnam. The model employed in the research is the Spatial Durbin Model (SDM), which is used to test hypotheses on data collected from enterprise surveys in the provinces of Vietnam over the period 2011–18. The research results show that the institutional quality of a locality has a direct impact on firm performance in that locality and indirectly affects firms in adjacent localities. At the same time, enterprises in different localities not only interact spatially with each but also tend to cooperate and compete. The results also show that the control of corruption positively affects the profits of enterprises; and informal charges negatively influence firms' total factor productivity in Vietnam. These findings imply that improving the quality of subnational institutions in emerging countries such as Vietnam promotes the growth of enterprises.

Introduction

Institutional quality has been shown to influence economic growth (Acemoglu et al. 2001; Hasan et al. 2009; Baumöhl et al. 2019) and affect firm performance (Fidrmuc et al. 2017; Ghoul et al. 2017; Baumöhl et al. 2019). Emerging economies are seen to be vulnerable and easily affected by institutional quality (LiPuma et al. 2013). Poor national institutions are one of the conditions that cause indirect welfare costs to society in the form of reduced economic growth (Acemoglu et al. 2003; Loayza et al. 2007). Consequently, countries with corrupt governments, poor legal systems, and

excessive government intervention are likely to have poor economic efficiency (Faruq and Weidner 2018). Consistent and transparent regulations, a well-developed and fair legal system, and easy access to financial services are important attributes of institutional development (North 1986, 1993; LiPuma et al. 2013). Disparities in economic effectiveness between different countries can be partly due to differences in their institutional environment (Faruq and Weidner 2018).

In particular, the institutional quality of a country affects the local business environment, the competitiveness and profitability of companies, and can cause enterprises to go bankrupt (Deng and Zhang 2018; Baumöhl

* The Nguyen Huynh, Lecturer, University of Finance-Marketing, Ho Chi Minh City, Vietnam (Corresponding Author, huynhthenguyen@ufm.edu.vn). There are no potential conflicts of interest with respect to this study. The author received no financial support for this research.

et al. 2019). In emerging markets such as Vietnam, firm performance is strongly influenced by institutions because many enterprises are small and medium-sized. Furthermore, private small and medium-sized enterprises tend to face significant domestic institutional challenges (Cardoza et al. 2016; Stoian and Mohr 2016; Deng and Zhang 2018), while state-owned enterprises have often to use more proactive manoeuvres to attract institutional attention and gain incentives from the government (Shi et al. 2014; Narooz and Child 2017; Deng and Zhang 2018).

In developing countries, localities tend to be economically, socially, and culturally heterogeneous. Firms perform better in cities with higher institutional quality (Hussen and Çokgezen 2020). Therefore, it seems plausible to assume that institutional quality varies from region to region and locality within each country. At the same time, geography is a positive contextual factor for enterprises (Agostino et al. 2020; Hussen and Çokgezen 2020). Subnational institutions are particularly relevant to enterprises as they are often deeply rooted in the locality in which they operate (Agostino et al. 2020).

Research at the national level does not necessarily help us understand the impact of institutions faced by economic sectors and companies. At the same time, firm-level analyses play an important role in explaining why the impact of institutions varies across firms and localities (Nguyen and van Dijk 2012).

Vietnam has undergone significant economic transition and has many huge differences in its provincial institutions. While Vietnam has a uniform political system, and government spending is relatively equal across localities, economic efficiency is fundamentally different across localities (Tran et al. 2009; Nguyen et al. 2013). Weaknesses in institutions remain the major constraint to firm performance (Tran et al. 2009; Nguyen et al. 2013). At the same time, local officials in Vietnam have a high degree of discretion. Provincial governments in Vietnam do not have the power to enact laws, while their processes in implementing laws often differ between provinces. As a result, private firms often face additional challenges of institutional uncertainty. Firms often face

inequitable regulatory environments, and they tend to incur higher costs in establishing and doing business (Tran et al. 2009; Nguyen et al. 2013). In addition, the public may view these small and medium-sized enterprises as companies exploiting workers, deceiving the government, or providing low-quality products (Nguyen et al. 2013).

This article contributes to the literature in various ways. First, the paper examines spatial effects to systematically assess the impact of institutional quality, unlike previous research on general institutional changes at the national level. This approach should more fully appreciate the influential nature of institutions, whereby the various aspects of the institutions in different regions are interrelated and co-exist. In particular, the research indicates that changing institutions in a locality not only has a direct impact on the performance of enterprises in that locality but also indirectly affects the performance of enterprises in neighbouring localities. Although external factors can generate synergy from vertical agglomeration through upstream and downstream activities (Krugman 1991), the spatial interaction between these factors in affecting firm performance fully reflects the structure of an economy. Therefore, the research finds that enterprises in neighbouring localities work together to increase productivity but compete for profits.

Second, most of the existing studies on the influence of national or local institutional quality assume completely independent administrative units. The article points out that these assumptions are not appropriate because localities often share policies and economic activities. If analysis of the effect of institutional quality on firm performance does not consider the spatial interaction between localities, the results are likely to be biased and inconsistent. The promulgation of laws and policies in Vietnam is uniform and highly centralised, but implemented according to the understanding of local authorities (Tran et al. 2009). There is reason to believe that the improvement of public administration within a locality can directly influence public administration in a neighbouring locality. Firms will be more likely to

migrate to or use resources in localities with better institutional quality or increase their activity in such locations, thereby increasing economic activity in neighbouring areas due to agglomeration effects (Bologna et al. 2016). Thus, a spatial impact assessment can scrutinise the influence of institutional quality on the process of institutional change between provinces.

Third, the article examines firm performance in two respects: return on assets and total factor productivity. The return on assets is a measure of viability and total factor productivity is a driver of firm growth. However, there is ample evidence that total factor productivity and return on assets not only depend on the characteristics of resources of the enterprise and the industry in a locality but also on the characteristics of resources in adjacent localities. Such proximity creates horizontal economic agglomeration and attract more specialised workers, facilitating the development of more specialised inputs and absorbing the spillovers of new technology.

The research examines the effects of proxy variables for institutional quality, including transparency, time costs, and informal charges, on firm performance. Transparency reflects the firm's ability to access appropriate planning documents and business information needed to operate economic activities (Nguyen et al. 2013). Time costs and informal charges describe the lack of efficient and effective public administration. Furthermore, Faruq and Weidner (2018) suggest that some companies may have difficulty purchasing resources in environments with weak property rights and contract laws, which can lead to higher costs for firms engaging in economic transactions. Therefore, the study adds a corruption variable to measure the strength of the contract and property law system to reflect institutional quality more fully.

Theoretical background

North (1990) argues that institutions are the rules of the game in a society, or more formally, constraints designed to shape human interactions. Meanwhile, Scott (1995) has

defined institutions as cognitive structures and activities, rules, and regulations that provide stability and meaning for social behaviour. Thus, an institutional framework is a set of fundamental political, social, and legal rules that form the basis of production, exchange, and distribution (Peng 2002).

Institutional quality determines workers' ability to access valuable resources and pieces of knowledge to develop a competitive advantage (Deng and Zhang 2018). Low-quality institutions, due to a lack of legal and political infrastructure, make enforcement work often arbitrary (Cardoza et al. 2016; Deng and Zhang 2018). High-quality institutions facilitate smooth transactions between individuals and organisations, resulting in low transaction costs (Deng and Zhang 2018). Furthermore, LiPuma et al. (2013) have argued that high-quality institutions are crucial to economic growth because they facilitate easy transactions between individuals and workers. Therefore, institutional quality has a causal impact on economic development (North 1990; Acemoglu et al. 2001, 2002; Easterly and Levine 2003). Institutions impact on economic growth through information provision, safety of property rights, and strict enforcement mechanisms to stimulate cooperation (Tran et al. 2009). Better institutions are associated with higher economic efficiency (Hall and Jones 1999; Acemoglu et al. 2001; Tran et al. 2009). Thus, institutions played an important role in explaining differences in economic growth across countries (Acemoglu et al. 2005). The quality of economic institutions is the determinant of the prosperity of nations and regions.

Sen and Rajesh (2017) and Yasar et al. (2011) pointed out that institutional quality has played a significant role in firm performance. It is because institutional quality has influenced firms' output effectiveness and the factor-in-use efficiency of companies (Bhaumik et al. 2017). Without a healthy institutional environment, the market will develop anticompetitive practices and thus perform poorly. Baumol (1990) has suggested that the institutional framework will make the activities of the business community productive, ineffective, or destructive to society. Hussen and Çokgezen (2020) argue that

well-developed institutions provide the necessary incentives for firms to spend on long-term investments such as R&D and worker training, thereby improving their performance. In contrast, low-quality institutional sectors will create an uncertain business environment and insecure property rights that constrain the firm's business strategies. In particular, a poor degree of property rights protection will affect the survival of enterprises (Che et al. 2017; Zhang et al. 2017; Baumöhl et al. 2019) and impact the possibility of companies' entry. The business environment is not only the centre of economic activities but also has a significant impact on investment opportunities for enterprises. Assured assets right, low transaction costs, and available finance are central characteristics of well-performing markets and enable companies to make business decisions to improve their performance (Baumöhl et al. 2019).

In addition, the strategies of firms may change based on institutional processes and changes in the markets in which they operate (Perkins 2014; Dau et al. 2020). The institutions that change the operation of the market will affect the performance of firms. Agostino et al. (2020) point out that subnational institutions are significant for firm productivity. Companies are often bound by the geographic area in which they operate. Furthermore, institutional quality is a particular form of production input that can complement the advantage for firms (Agostino et al. 2020). The presence of high-quality institutions facilitates production and promotes the accumulation of physical and human capital (Nifo et al. 2017), which in turn boosts the productivity of firms (Agostino et al. 2020). In addition, Tran et al. (2016) pointed out that low-quality subnational institutions can damage a company's reputation, hinder the effective allocation of resources and inhibit the development of corporate culture. It can lead to higher costs and make it harder for companies to improve their productivity (Faruq and Weidner 2018). Agostino et al. (2020) argue that good political and legal system quality can help firms shape options, operations, and strategies for maximising utility. Furthermore, high-quality institutions will encourage business activities because investors

tend to look for places where contracts are valid and clear to do business safely and effectively (Acemoglu et al. 2002; Agostino et al. 2020). Institutional quality has a spillover effect on firm productivity through incentives (Bhaumik et al. 2017) and accelerates convergence to the productivity level of domestic market leaders (Agostino et al. 2020).

Data and research methods

Model and research data

The paper comes from the general spatial econometric model as follows:

$$y_{it} = \rho W y_{it} + X_{it} \beta + W X_{it} \theta + v_{it}, \quad (1)$$

where W is the spatial weight matrix that provides the spatial arrangement of the units in the sample; $W y_{it}$ describes the spatially lagged dependent variables; $W X_{it}$ captures the lagged independent variables; ρ is an autoregressive parameter that represents dependence in the dependent variable. The weight matrix W is very significant in the empirical analysis. Each element w_{ij} of the matrix W reflects the interaction between locality i and j . The main diagonal of the weight matrix is zero because localities do not interact with that locality itself, and the further the distance between localities, the weaker the interaction. Elhorst (2003) argued that there were different ways to set up the weight matrix. The use of various matrices could lead to different outcomes for the explanatory and dependent variables, but the characteristics of the lagged dependent variables ($W y_{it}$) remained the same. Therefore, the research used the inverse distance-based weighting matrix as the weight matrix in the model. This is similar to the approach of Mori and Smith (2014) on spatial interaction and the influence of business clusters from the combination of nearby administrative units (Gokan et al. 2019). At the same time, it will explain the interdependence between firms in the same industry from the popular view of

localisation economies (Hu et al. 2015). The inverse distance-based weighting matrix is determined based on the actual distance between two localities, and the geographical distance is calculated based on the longitude and the latitude between administrative units. Furthermore, the inverse matrix can explain the variables depending on the geographical proximity more reasonably than the binary contiguity matrix which only deals with the nearby effect (Kayam et al. 2013). The detailed calculation for the inverse distance spatial weight matrix is as follows:

$$w_{ij}^{Distance} = \begin{cases} \frac{1}{d_{ij}}, & i \neq j, i = 1, \dots, N; j = 1, \dots, N; \\ 0, & i = j, i = 1, \dots, N; j = 1, \dots, N. \end{cases}$$

where d_{ij} is the Euclidian distance between the capitals of the province i and j (Wu et al. 2019). Return on assets (ROA) is the proxy variable of firm performance (Choi et al. 2015). It is a decisive factor on the survival of the company (Görg and Spaliara 2014; Baumöhl et al. 2019). The ROA is determined by the total profits to total assets ratio. Another proxy variable of firm performance is total factor productivity (TFP) to comprehensively examine the research objectives (Sen and Rajesh 2017). Total factor productivity is the Solow residual in the production function (Tran et al. 2016; Sen and Rajesh 2017). It is a one-stage productivity estimation method to avoid arguments about defining, approaching, and estimating productivity. At the same time, the two-stage approach is less effective than the one-stage approach (De Rosa et al. 2015; Tran et al. 2016). Thus, the total factor productivity is calculated from the Cobb–Douglas production function as follows:

$$Q_{it} = TFP_{it} K_{it}^{\alpha} L_{it}^{\beta}, \quad (2)$$

where Q is the total output; K is capital and L is labour; α and β are the income share of capital and labour to total income. Take the logarithm of Equation 2 to get:

$$\ln TFP_{it} = \ln(Q_{it}) - \alpha \ln(K_{it}) - \beta \ln(L_{it}) \quad (3)$$

Ugur (2010) argued that there were many approaches to examining institutional quality. Commonly used institutional quality measures include governance, voice and accountability, political stability, government effectiveness, regulatory quality, the rule of law, and control of corruption (Kandil 2009). However, the quality of institutions as a governance quality is more pervasive in the economy and organisations in the economic sectors (Ugur 2010). Therefore, the provincial institutional quality in this study collects from the Provincial Competitiveness Index (PCI) on Vietnam’s business environment annually conducted by the Vietnam Chamber of Commerce and Industry (Tran et al. 2009; McCulloch et al. 2013; Nguyen et al. 2013). The great strength of the PCI is that it reflects the quality of provincial economic governance with the best practices in Vietnam. Tran et al. (2009) pointed out that PCI was a weighted index of nine subindices, including business entry costs; access to land; transparency and access to information; time costs of regulatory compliance; informal charges; implementation and consistency of policies; state sector bias; pro-activity of provincial leadership; and private sector development policies. Each subindices is given a score from one to 10, and PCI is scored from one to 100, with the higher the score, the better the institutional performance (Tran et al. 2009). Variables such as transparency, time costs, and informal charges were extracted from the PCI data for Vietnam; the corruption variable was collected from the PAPI (Vietnam Provincial Governance and Public Administration Performance Index) annually conducted by the United Nations Development Programs in Vietnam.

To consider factors that have little to do with the institutional quality and government actions that can change firm performance, we use control variables such as the capital–labour ratio, fixed assets, and labour. These are the variables associated with the production functions and characteristics of the companies. The capital–labour ratio, determined by total capital to total labour, is a proxy

variable for capital intensity per worker. Fixed assets and labour are measured by firms' total fixed assets and employees in the enterprise. These variables were collected from the Vietnam Enterprise Survey, annually conducted by the General Statistics Office of Vietnam.¹ This information is aggregated to the provincial and national levels to serve the economic management of the Government of Vietnam. The variables of fixed assets and labour are presented in logarithmic form to avoid outliers and provide a better interpretation (elasticity) in the analysis process. The statistics of variables are presented in Table 1.

Data on the institutional quality and total factor productivity in Table 1 reveals variation between the maximum value, minimum value, and standard deviation, which indicates unevenness of institutional quality across localities in the research period. Although Vietnamese laws are equally applicable, there may be differences in interpretation and application in different localities. Therefore, the article estimated two research models: first, on the impact of institutional quality on firm performance in Models (1) and (2).

$$RA_{it} = \beta_1 IQ_{it} + \beta_2 CL_{it} + \beta_3 FA_{it} + \beta_4 LA_{it} + \theta_1 WIQ_{it} + \theta_2 WCL_{it} + \theta_3 WFA_{it} + \theta_4 WLA_{it} + \rho WRA_{it} + v_{it} \quad (\text{Model1})$$

$$TFP_{it} = \beta_1 IQ_{it} + \beta_2 CL_{it} + \beta_3 FA_{it} + \beta_4 LA_{it} + \theta_1 WIQ_{it} + \theta_2 WCL_{it} + \theta_3 WFA_{it} + \theta_4 WLA_{it} + \rho WTFP_{it} + v_{it} \quad (\text{Model2})$$

where RA is the return on assets; TFP is total factor productivity; IQ is institutional quality; CL is the capital–labour ratio; FA is total fixed assets; LA is labour. Secondly, the article adds elements of control of corruption, transparency, time costs, and informal charges to seek consistency on the impact of institutional quality on firm performance in Models (3) and (4).

$$RA_{it} = \beta_1 IQ_{it} + \beta_2 CL_{it} + \beta_3 FA_{it} + \beta_4 LA_{it} + \beta_5 CO_{it} + \beta_6 TR_{it} + \beta_7 TC_{it} + \beta_8 IC_{it} + \theta_1 WIQ_{it} + \theta_2 WCL_{it} + \theta_3 WFA_{it} + \theta_4 WLA_{it} + \theta_5 WCO_{it} + \theta_6 WTR_{it} + \theta_7 WTC_{it} + \theta_8 WIC_{it} + \rho WRA_{it} + v_{it} \quad (\text{Model3})$$

$$TFP_{it} = \beta_1 IQ_{it} + \beta_2 CL_{it} + \beta_3 FA_{it} + \beta_4 LA_{it} + \beta_5 CO_{it} + \beta_6 TR_{it} + \beta_7 TC_{it} + \beta_8 IC_{it} + \theta_1 WIQ_{it} + \theta_2 WCL_{it} + \theta_3 WFA_{it} + \theta_4 WLA_{it} + \theta_5 WCO_{it} + \theta_6 WTR_{it} + \theta_7 WTC_{it} + \theta_8 WIC_{it} + \rho WTFP_{it} + v_{it} \quad (\text{Model4})$$

In which CO is control of corruption; TR is transparency; TC is time costs; and IC is informal charges.

Table 1
Summary description of research variables

Variables	Maximum	Minimum	Mean	Standard deviation
Return on assets	0.2566	-0.0681	0.0268	0.0368
Total factor productivity	1.9992	-1.6720	0.7038	0.6817
Institutional quality	73.5300	45.1170	59.4040	4.0122
Capital–labour ratio	4.3706	0.1025	0.5191	0.4818
Fixed assets	15.1559	7.5055	10.4649	1.3381
Labour	14.9000	8.8757	11.3437	1.1298
Control of corruption	7.7127	1.1045	5.4567	1.5417
Transparency	7.6251	2.9305	6.0313	0.5512
Time costs	8.9019	3.5083	6.4775	0.8807
Informal charges	8.9426	2.8092	5.8348	1.0838

¹ For more details, see <https://www.gso.gov.vn/en/enterprises>

Research methods

There are two popular tools for testing spatial dependence in the data, the Moran test and the Lagrange multiplier test. The Lagrange multiplier tests are applied to determine the spatial correlation between observations (Elhorst 2012) and to choose a suitable spatial model for data structures (Dubin 2004). Moreover, the Spatial Durbin Model covers the Spatial Autoregressive Model and Spatial Error Model, so the article has used the Lagrange multiplier tests to choose whether to use the Spatial Durbin Model or Spatial Autocorrelation Model to analyse the research results. The article uses the Maximum Likelihood Estimation for fixed effects and random effects as proposed by Elhorst (2010a). The advantage of the Maximum Likelihood Estimation in spatial econometrics compared to the Generalised Method of Moments is to emphasise the Jacobian term in the log-likelihood function to end up with a coefficient estimate for ρ outside its parameter space (Elhorst 2010b). In addition, the study used the Hausman test to choose between the fixed effect model and the random effect model to analyse the research results.

Elhorst (2012) and LeSage and Pace (2009) have shown that using point estimates of one or more spatial regression models to test the hypotheses about whether spatial spillovers exist may lead to erroneous and inconsistent conclusions. This comes from spatial regression that exploits very complex dependencies in the data structures of localities. In particular, the change of dependent variable in a locality is not only caused by that locality but also comes from neighbouring localities. In other words, there exist direct and indirect effects in spatial regression.

Research results and discussion

Table 2 shows the spatial interactions in firm performance in the provinces of Vietnam. Enterprises in different localities have interacted with

each other. Especially the exploitation, sharing, and linking of resources in the production process creates profits in enterprises. Furthermore, institutional quality has a spatial correlation between localities in 2012 and 2013 at the 1 per cent and 5 per cent significance levels. This result is seen in variables such as control of corruption, transparency, time costs, and informal charges. Thus, improvement of institutional quality in province i influences the institutional quality of province j . Although the law is uniformly regulated centrally in Vietnam, law enforcement depends heavily on interpretation by local officials. Even when regulations are clear and consistent, local governments can apply their interpretations to central government policies (Tran et al. 2009). As a result, the spatial correlation of institutional quality makes sense for enterprises and governments of nearby provinces in terms of transactions and mutual learning (Bologna et al. 2016).

Table 2 also shows the spatial correlation of factors such as the capital-labour ratio, fixed assets, and labour at all significance levels, which indicates that there is a strong interaction in terms of production resources among localities of Vietnam. A change in production resources in a locality can directly or indirectly affect the production resources of neighbouring localities. In general, the results presented in Table 2 reflect that the Ordinary Least Square method will give inconsistent results because there is the presence of spatial interactions in the observations (Elhorst 2003). Dependent variables such as return on assets and total factor productivity, independent variables such as informal charges and time costs, and control variables such as labour and fixed assets have a spatial correlation with both spatial error and spatial lag. In principle, if an observation suffers from spatial interaction, it is advisable to apply spatial econometrics to the analysis of the results (Elhorst 2010a,b), and where spatial error and spatial lag exist, the Spatial Durbin Model will be more suitable than the Spatial Autocorrelation Model.

Table 3 presents the results from Equation (4) of spatial regression by fixed effects by time and firm. There is a high similarity in factors

Table 2
Lagrange multiplier tests for spatial dependence

Variables	2011	2012	2013	2014	2015	2016	2017	2018
Total factor productivity	28.023*** <i>Sp. Error</i>	29.031*** <i>Sp. Lag</i>	9.589** <i>Sp. Error</i>	11.289** <i>Sp. Lag</i>	26.948*** <i>Sp. Error</i>	14.547*** <i>Sp. Lag</i>	4.459** <i>Sp. Error</i>	5.710** <i>Sp. Lag</i>
Return on assets	13.309*** <i>Sp. Error</i>	18.133*** <i>Sp. Lag</i>	9.245** <i>Sp. Error</i>	11.976** <i>Sp. Lag</i>	28.513*** <i>Sp. Error</i>	18.559*** <i>Sp. Lag</i>	10.841** <i>Sp. Error</i>	14.294*** <i>Sp. Lag</i>
Capital-labour ratio	2.432 <i>Sp. Error</i>	5.999** <i>Sp. Lag</i>	0.082 <i>Sp. Error</i>	0.839 <i>Sp. Lag</i>	0.048 <i>Sp. Error</i>	0.673 <i>Sp. Lag</i>	0.511 <i>Sp. Error</i>	2.208 <i>Sp. Lag</i>
Labour	3.772* <i>Sp. Error</i>	5.248** <i>Sp. Lag</i>	0.261 <i>Sp. Error</i>	3.832** <i>Sp. Lag</i>	1.049 <i>Sp. Error</i>	3.475** <i>Sp. Lag</i>	3.710* <i>Sp. Error</i>	8.788** <i>Sp. Lag</i>
Fixed assets	0.587 <i>Sp. Error</i>	0.765 <i>Sp. Lag</i>	0.671 <i>Sp. Error</i>	0.765 <i>Sp. Lag</i>	0.014 <i>Sp. Error</i>	0.039 <i>Sp. Lag</i>	0.226 <i>Sp. Error</i>	0.008 <i>Sp. Lag</i>
Institutional quality	0.358 <i>Sp. Error</i>	0.887 <i>Sp. Lag</i>	0.742 <i>Sp. Error</i>	1.829 <i>Sp. Lag</i>	1.507 <i>Sp. Error</i>	1.875 <i>Sp. Lag</i>	2.261 <i>Sp. Error</i>	2.768** <i>Sp. Lag</i>
Control of corruption	6.253** <i>Sp. Error</i>	7.157** <i>Sp. Lag</i>	8.392** <i>Sp. Error</i>	8.869** <i>Sp. Lag</i>	9.515** <i>Sp. Error</i>	10.419** <i>Sp. Lag</i>	11.002** <i>Sp. Error</i>	11.412** <i>Sp. Lag</i>
Transparency	7.330** <i>Sp. Error</i>	7.850** <i>Sp. Lag</i>	9.169** <i>Sp. Error</i>	9.838** <i>Sp. Lag</i>	10.519** <i>Sp. Error</i>	11.582** <i>Sp. Lag</i>	12.398*** <i>Sp. Error</i>	12.719*** <i>Sp. Lag</i>
Time costs	3.076* <i>Sp. Error</i>	3.030* <i>Sp. Lag</i>	2.552 <i>Sp. Error</i>	2.101 <i>Sp. Lag</i>	4.414** <i>Sp. Error</i>	3.379* <i>Sp. Lag</i>	2.459* <i>Sp. Error</i>	3.849* <i>Sp. Lag</i>
Informal charges	5.127** <i>Sp. Error</i>	4.204** <i>Sp. Lag</i>	4.594** <i>Sp. Error</i>	3.767* <i>Sp. Lag</i>	3.182* <i>Sp. Error</i>	3.373** <i>Sp. Lag</i>	5.551** <i>Sp. Error</i>	4.896** <i>Sp. Lag</i>
	1.359 <i>Sp. Error</i>	16.126*** <i>Sp. Lag</i>	11.426** <i>Sp. Error</i>	0.712 <i>Sp. Lag</i>	0.004 <i>Sp. Error</i>	0.088 <i>Sp. Lag</i>	0.198 <i>Sp. Error</i>	0.850 <i>Sp. Lag</i>
	0.362 <i>Sp. Error</i>	0.820 <i>Sp. Lag</i>	0.002 <i>Sp. Error</i>	0.818 <i>Sp. Lag</i>	0.247 <i>Sp. Error</i>	0.132 <i>Sp. Lag</i>	0.398 <i>Sp. Error</i>	0.952 <i>Sp. Lag</i>
	32.495*** <i>Sp. Error</i>	3.761* <i>Sp. Lag</i>	43.081*** <i>Sp. Error</i>	22.827*** <i>Sp. Lag</i>	22.645*** <i>Sp. Error</i>	1.095 <i>Sp. Lag</i>	9.749** <i>Sp. Error</i>	0.390 <i>Sp. Lag</i>
	0.019 <i>Sp. Error</i>	2.599 <i>Sp. Lag</i>	1.167 <i>Sp. Error</i>	0.853 <i>Sp. Lag</i>	2.237 <i>Sp. Error</i>	0.114 <i>Sp. Lag</i>	0.214 <i>Sp. Error</i>	0.039 <i>Sp. Lag</i>
	1.558 <i>Sp. Error</i>	0.230 <i>Sp. Lag</i>	0.009 <i>Sp. Error</i>	0.112 <i>Sp. Lag</i>	0.288 <i>Sp. Error</i>	0.681 <i>Sp. Lag</i>	0.730 <i>Sp. Error</i>	1.575 <i>Sp. Lag</i>
	0.656 <i>Sp. Error</i>	0.425 <i>Sp. Lag</i>	2.747* <i>Sp. Error</i>	0.010 <i>Sp. Lag</i>	0.677 <i>Sp. Error</i>	1.723 <i>Sp. Lag</i>	3.898** <i>Sp. Error</i>	8760** <i>Sp. Lag</i>
	0.275 <i>Sp. Error</i>	0.177 <i>Sp. Lag</i>	59.222*** <i>Sp. Error</i>	58.545*** <i>Sp. Lag</i>	57.392*** <i>Sp. Error</i>	86.018*** <i>Sp. Lag</i>	52.837*** <i>Sp. Error</i>	90.108*** <i>Sp. Lag</i>
	1.457 <i>Sp. Error</i>	0.691 <i>Sp. Lag</i>	0.526 <i>Sp. Error</i>	1.764 <i>Sp. Lag</i>	1.425 <i>Sp. Error</i>	0.156 <i>Sp. Lag</i>	4.286** <i>Sp. Error</i>	4.432** <i>Sp. Lag</i>
	15.145*** <i>Sp. Error</i>	7.292** <i>Sp. Lag</i>	47.545*** <i>Sp. Error</i>	32.982*** <i>Sp. Lag</i>	19.595*** <i>Sp. Error</i>	28.156*** <i>Sp. Lag</i>	46.668*** <i>Sp. Error</i>	68.404*** <i>Sp. Lag</i>
	3.181* <i>Sp. Error</i>	2.696 <i>Sp. Lag</i>	2.020 <i>Sp. Error</i>	5.096** <i>Sp. Lag</i>	5.641** <i>Sp. Error</i>	5.890** <i>Sp. Lag</i>	3.472* <i>Sp. Error</i>	5.950** <i>Sp. Lag</i>

Sp. Error = Spatial Error, Sp. Lag = Spatial Lag.

*, **, *** correspond to significance levels of 10 per cent, 5 per cent, and 1 per cent.

affecting firm performance, including fixed assets, labour, and control of corruption. In addition, there are many θ coefficients in the research models that are statistically significant at the 5 per cent and 10 per cent levels, reflecting that spatial interactions not only appear in the dependent variable but also exist in the independent variable. In other words, there is a spatial interaction of resources that affects firm performance in provinces.

The results of the Hausman test have shown that the Spatial Durbin Model with fixed effects is consistent with the data structure at the significance levels of 1 per cent and 5 per cent. Furthermore, the ρ is statistically significant at the 5 per cent and 10 per cent level, reflecting the spatial interaction of firm performance in provinces. Enterprises in neighbouring localities tend to compete ($\rho < 0$)

on profit and promote each other ($\rho > 0$) on total factor productivity. Thus, enterprises in different localities compete (profitability) and cooperate (total factor productivity) with each other in their development process.

The study separately considers the fixed effects of time and firm to check the robustness of the Models (1)–(4) in Table 4. The results show that the ρ coefficient is statistically significant at the 5 per cent and 10 per cent levels, capturing the spatial correlation to firm performance in the provinces. This does not contradict the results in Table 3. Thus, there are direct effects and indirect effects in the spatial regression model.

Table 5 shows that the labour of the firm in a province has a direct effect on firm performance in that province at the 1 per cent level of significance. Meanwhile, the institutional quality of a locality has an indirect effect on

Table 3
Results of the spatial regression

Variables	Firm Performance			
	Model 1	Model 2	Model 3	Model 4
Institutional quality	0.0007* (0.0003)	-0.0021 (0.0031)	0.0001 (0.0005)	-0.0024 (0.0044)
Capital-labour ratio	0.0034 (0.0052)	0.0485 (0.0416)	-0.0041 (0.0052)	0.0274 (0.0418)
Fixed assets	-0.0077 (0.0050)	-0.7808*** (0.0402)	-0.0117** (0.0048)	-0.7201*** (0.0381)
Labour	0.0497*** (0.0094)	0.6743*** (0.0751)	0.0496*** (0.0096)	0.6931*** (0.0758)
Control of corruption			0.0020* (0.0011)	-0.0229** (0.0087)
Transparency			0.0004 (0.0024)	0.0028 (0.0192)
Time costs			0.0007 (0.0016)	0.0111 (0.0125)
Informal charges			0.0001 (0.0017)	-0.0120 (0.0130)
Wx				
Institutional quality	0.0042** (0.0012)	0.0216** (0.0099)	0.0026* (0.0015)	0.0350** (0.0120)
Capital-labour ratio	0.0094 (0.0258)	0.4265** (0.2058)	0.0023 (0.0265)	0.3697* (0.2090)
Fixed assets	0.0106 (0.0193)	0.1617 (0.1616)	0.0087 (0.0188)	0.3450** (0.1618)
Labour	-0.0178 (0.0321)	-0.1898 (0.2643)	-0.0162 (0.0224)	-0.2194 (0.2644)
Control of corruption			0.0018 (0.0023)	0.0163 (0.0182)
Transparency			-0.0022 (0.0088)	0.0115 (0.0702)
Time costs			-0.0034 (0.0047)	-0.0940** (0.0380)
Informal charges			0.0029 (0.0045)	-0.0429 (0.0369)
Test				
Rho	-0.4155**	0.3379**	-0.3166*	0.324**
Hausman	33.28**	46.35***	34.83**	26.55**
Observations	504	504	504	504

() = Standard errors.

*, **, *** correspond to significance levels of 10 per cent, 5 per cent and 1 per cent.

Table 4
Robustness check of the spatial correlation

Variables	Model 1			Model 2			Model 3			Model 4		
	Firm fixed effects	Year fixed effects	Year fixed effects	Firm fixed effects	Year fixed effects	Year fixed effects	Firm fixed effects	Year fixed effects	Year fixed effects	Firm fixed effects	Year fixed effects	Year fixed effects
Institutional quality	0.0001* (0.0004)	0.0024*** (0.0005)	-0.0006 (0.0030)	0.0404*** (0.0062)	0.0013** (0.0006)	0.0011 (0.0008)	-0.0047 (0.0045)	0.0153 (0.0101)	0.0011 (0.0008)	-0.0047 (0.0045)	0.0153 (0.0101)	0.0153 (0.0101)
Capital-labour ratio	0.0044 (0.0053)	0.0002 (0.0064)	0.0275 (0.0423)	-0.2815*** (0.0778)	0.0030 (0.0053)	0.0010 (0.0064)	0.0362 (0.0413)	-0.3308*** (0.0779)	0.0010 (0.0064)	0.0362 (0.0413)	-0.3308*** (0.0779)	-0.3308*** (0.0779)
Fixed assets	-0.0131** (0.0048)	-0.0030 (0.0056)	-0.7116*** (0.3081)	-0.3433*** (0.0652)	-0.0077 (0.0051)	-0.0019 (0.0056)	-0.7683*** (0.0400)	-0.2545*** (0.0665)	-0.0019 (0.0056)	-0.7683*** (0.0400)	-0.2545*** (0.0665)	-0.2545*** (0.0665)
Labour	0.0482*** (0.0097)	0.0031 (0.0060)	0.6938*** (0.0766)	0.3057*** (0.0715)	0.0473*** (0.0091)	0.0029 (0.0060)	0.6863*** (0.0746)	0.2322** (0.0727)	0.0029 (0.0060)	0.6863*** (0.0746)	0.2322** (0.0727)	0.2322** (0.0727)
Control of corruption					0.0011 (0.0015)	-0.0040* (0.0034)	-0.0025 (0.0119)	0.0333 (0.0285)	-0.0040* (0.0034)	-0.0025 (0.0119)	0.0333 (0.0285)	0.0333 (0.0285)
Transparency					-0.0013 (0.0025)	0.0012 (0.0038)	0.0009 (0.0195)	0.0235 (0.0449)	0.0012 (0.0038)	0.0009 (0.0195)	0.0235 (0.0449)	0.0235 (0.0449)
Time costs					-0.0022 (0.0016)	0.0042 (0.0026)	0.0067 (0.0132)	0.0714** (0.0314)	0.0042 (0.0026)	0.0067 (0.0132)	0.0714** (0.0314)	0.0714** (0.0314)
Informal charges					-0.0002 (0.0017)	0.0058** (0.0025)	-0.0004 (0.0137)	0.0641** (0.0310)	0.0058** (0.0025)	-0.0004 (0.0137)	0.0641** (0.0310)	0.0641** (0.0310)
Test												
Rho (ρ)	-0.2173* (0.1238)	-2.3282* (1.3873)	0.3855*** (0.1026)	0.8245*** (0.0886)	-0.3715** (0.1305)	-2.1473* (1.2872)	0.2776** (0.1100)	0.6398*** (0.1033)	-0.3715** (0.1305)	0.2776** (0.1100)	0.6398*** (0.1033)	0.6398*** (0.1033)
Hausman	18.14**	26.97**	15.08***	86.40***	31.19**	53.35***	45.58**	78.11***	31.19**	45.58**	78.11***	78.11***
Observations	504	504	504	504	504	504	504	504	504	504	504	504

() = Standard errors.

*, **, *** correspond to significance levels of 10 per cent, 5 per cent and 1 per cent.

firm performance in neighbouring localities at the 5 per cent level of significance. However, there is no statistical evidence that the institutional quality in a locality directly affects the performance of enterprises there. This result may stem from the interpretation and application of the law by officials. In addition, it may reflect the bottlenecks of a unified institution applied to localities with different contexts. In terms of total effects, the institutional quality (and labour) of a province positively affects firm performance in that province and neighbouring provinces at the 1 per cent and 5 per cent significance levels. Thus, the quality of institutions in a locality affects firms in different localities. In other words, high-quality organisations in a province will help companies in the whole region do business more effectively (Yasar et al. 2011). Therefore, improvements in institutional quality enhance firm performance (Robles 2017; Deng and Zhang 2018). However, the study has not found statistical evidence of the impacts of the capital–labour ratio and fixed assets and their spatial interactions on firm performance (return on assets). This outcome may stem from the obsolescence of machinery and equipment, the labour-intensive economy, and the limitations of the spread of signals on production techniques in enterprises. At the same time, many Vietnamese companies are small enterprises, lacking the scale and technology needed to increase productivity and expand their performance (World Bank 2017).

Table 6 also shows that institutional quality (and labour) of a locality positively affects firm performance in that locality and

neighbouring localities. In addition, fixed assets have a directly negative impact on firm performance in a locality, and there is no evidence to indicate effects on the performance of enterprises in neighbouring localities. This means that the fixed assets of firms in one province do not affect the fixed assets of enterprises in adjacent provinces. It may be because Vietnamese enterprises still use outdated machinery and equipment, leading to increased costs and reduced efficiency. Although machines have absorbed technological advances, they may not be compatible with the process of ongoing technological innovation. This outcome may stem from the inability of domestic firms to link up with foreign firms to absorb new knowledge and technology (World Bank 2017). In addition, the prolonged economic transformation in Vietnam has made most localities dependent on outdated and poorly diversified equipment, which limits the possibility of sustained growth and reduces the effects of dependence on machines. At the same time, institutions in emerging markets such as Vietnam are still in their infancy or have inadequately applied industrialisation programs, so they have not yet changed the structure of the economy (Epo and Nochi Faha 2020). Therefore, the relationship between machines, equipment, and firm performance gives mixed results.

Meanwhile, corruption control of the locality has a positive effect on firm performance in that locality and the whole region. Thus, the control of corruption has a spatial interaction with firm performance. A province with well-controlled corruption not only positively

Table 5
Impacts of institution quality on firm performance (Model 1)

Variables	Direct effects	Indirect effects	Total effects
Institutional quality	0.0005 (0.0004)	0.0018** ((0.0005)	0.0023*** (0.0006)
Capital–labour ratio	0.0033 (0.0054)	0.0043 (0.0117)	0.0077 (0.0122)
Fixed assets	−0.0079 (0.0052)	0.0059 (0.0090)	−0.0020 (0.0094)
Labour	0.0505*** (0.0093)	−0.0169 (0.0152)	0.0336** (0.0128)

() = Standard errors.

*, **, *** correspond to significance levels of 10 per cent, 5 per cent and 1 per cent.

Table 6
Impacts of institution quality on firm performance (Model 3)

Variables	Direct effects	Indirect effects	Total effects
Institutional quality	-0.0003 (0.0006)	0.0013* (0.0007)	0.0012** (0.0005)
Capital-labour ratio	0.0043 (0.0055)	0.0015 (0.0123)	0.0058 (0.0128)
Fixed assets	-0.0121** (0.0050)	0.0055 (0.0089)	-0.0066 (0.0090)
Labour	0.0513*** (0.0096)	-0.0153 (0.0149)	0.0360** (0.0145)
Control of corruption	0.0020* (0.0011)	0.0006 (0.0012)	0.0026*** (0.0007)
Transparency	0.0005 (0.0023)	-0.0014 (0.0041)	-0.0008 (0.0043)
Time costs	0.0009 (0.0016)	-0.0017 (0.0023)	-0.0007 (0.0022)
Informal charges	-0.0001 (0.0018)	0.0013 (0.0022)	0.0012 (0.0018)

() = Standard errors.

*, **, *** correspond to significance levels of 10 per cent, 5 per cent and 1 per cent.

Table 7
Impacts of institution quality on total factor productivity (Model 2)

Variables	Direct effects	Indirect effects	Total effects
Institutional quality	-0.0017 (0.0031)	0.0135** (0.0061)	0.0118* (0.0071)
Capital-labour ratio	0.0618 (0.0442)	0.2986** (0.1375)	0.3604** (0.1557)
Fixed assets	-0.7827*** (0.0414)	-0.0766 (0.1055)	-0.8593*** (0.1212)
Labour	0.6744*** (0.0697)	0.0333 (0.1588)	0.7076*** (0.1602)

() = Standard errors.

*, **, *** correspond to significance levels of 10 per cent, 5 per cent and 1 per cent.

affects firm performance in that province but also in the contiguous provinces, which could be the result of exploitation and sharing of production resources among enterprises in different localities, so one locality's corruption control can reduce production costs for enterprises in other localities. However, there is no statistical evidence to conclude that transparency, time costs, and informal charges influence firm performance in a locality and adjacent localities.

The results presented in Table 7 show that the institutional quality of a locality has an indirect impact on the total factor productivity of enterprises in the neighbouring locality at the 5 per cent significance level. In terms of total effects, institutional quality in a locality influences the total factor productivity of firms in that locality and contiguous localities at a significant level of 10 per cent. This indicates that the improvements in institutional quality

in a province not only enhance the total factor productivity of enterprises in that province but also in neighbouring provinces—a result similar to the effect of institutional quality on return on total assets in Table 5. This finding is consistent with the findings of Agostino et al. (2020) on institutional quality, considered a particular form of production input that can complement or replace favourable business characteristics of enterprises. Therefore, institutional quality will increase the benefits for companies thanks to its positive spatial effects on their total factor productivity. In general, high institutional quality supports innovation activities, business strategy, and competitiveness, leading to increased productivity (Acemoglu et al. 2002; Yasar et al. 2011; Hussen and Çokgezen 2020).

In addition, labour in a province not only directly affects the total factor productivity of enterprises in that province but also affects

Table 8
Impacts of institution quality on total factor productivity (Model 4)

Variables	Direct effects	Indirect effects	Total effects
Institutional quality	-0.0017 (0.0042)	0.0225** (0.0069)	0.0208** (0.0068)
Capital-labour ratio	0.0388 (0.0439)	0.2580* (0.1358)	0.2968** (0.1513)
Fixed assets	-0.7198*** (0.0389)	0.0621 (0.0960)	-0.6576*** (0.1062)
Labour	0.7019*** (0.0743)	0.0065 (0.1551)	0.7085*** (0.1692)
Control of corruption	-0.0227** (0.0083)	0.0061 (0.0107)	-0.0166** (0.0081)
Transparency	0.0034 (0.0187)	0.0052 (0.0443)	0.0086 (0.0500)
Time costs	0.0097 (0.0121)	-0.0575** (0.0235)	-0.0478* (0.0253)
Informal charges	-0.0130 (0.0134)	-0.0314 (0.0215)	-0.0443** (0.0209)

() = Standard errors.

*, **, *** correspond to significance levels of 10 per cent, 5 per cent and 1 per cent.

the total factor productivity of enterprises in nearby provinces. The capital-labour ratio has a positive indirect effect on the total factor productivity of enterprises in neighbouring provinces. In terms of total effects, the capital-labour ratio positively affects firms' productivity in a locality and neighbouring localities; showing the connection and sharing of production resources between enterprises in the province and neighbouring provinces. At the same time, there is spatial interaction in the labour market between provinces in Vietnam. Meanwhile, fixed assets directly reduce the total factor productivity of enterprises in a province and reduce the total factor productivity of companies in general in different provinces. Thus, fixed assets affect the own costs of each enterprise and have an impact on the production capacity of all enterprises in the economy. This feature both describes the current state of the machinery and reflects the pervasiveness of the production functions in emerging markets such as Vietnam.

The results in Table 8 also indicate that institutional quality in a locality indirectly affects firms' total factor productivity in neighbouring localities. With respect to the total effects, institutional quality in a province influences the total factor productivity of enterprises in that province and nearby provinces. At the same time, the results on the impact of the capital-labour ratio, labour, and

fixed assets on the total factor productivity of enterprises are consistent with the findings in Table 7. This outcome derives from the spatial interaction in exploiting the resources in the various localities. At the same time, the obsolescence of machines and equipment not only reduces profits but also reduces the effectiveness of Vietnamese enterprises.

Meanwhile, the control of corruption in a locality directly reduces the total factor productivity of enterprises in that locality and the whole region. Faruq and Weidner (2018) have argued that a low level of corruption control leads to low economic efficiency. Corruption is a result of opaque political, economic, and legal institutions. It can affect business and economic development (Tran et al. 2016). However, Nguyen and van Dijk (2012) argue that the effect of corruption on specific firms may differ due to the unequal treatment of state officials in public and private firms. Although corruption can undermine social and economic institutions and hinder the efficient allocation of resources (Lou 2002; Hung 2008; Tran et al. 2016), it plays the role of 'wheel lubrication' to promote firm growth (Tran et al. 2016). As such, corruption is simply an entry cost to join an established game and to help enterprises (North 1990; Tran et al. 2016). If one enterprise engages in corrupt behaviour, neighbouring enterprises are under pressure to act in similar ways. Hence, corruption is a common practice and has little

effect on the productivity of enterprises (Tran et al. 2016).

If administrative apparatus in a locality is cumbersome and has bureaucracy that increases the time costs, it will reduce firms' total factor productivity in that locality and neighbouring localities. In particular, the generation of time costs in a locality indirectly affects the total factor productivity of enterprises in neighbouring localities. As a result, high-quality institutions reduce costs for firms (Yasar et al. 2011; Robles 2017). Furthermore, informal charges in a locality have the effect of reducing the total factor productivity of enterprises in that locality and reducing the total factor productivity of enterprises in neighbouring localities. This is because the political system and government structure in Vietnam are the same in all provinces and provincial governments have no authority to enact laws and their officials have a high degree of arbitrariness compared to other emerging markets (Tran et al. 2009). This arrangement weakens market information provision, and its implementation varies from province to province, depending on the attitudes of the local government officials (Tran et al. 2009). Furthermore, weak legal, financial, and regulatory institutions lead to poor economic performance and volatility (LiPuma et al. 2013). Therefore, the lack of information about the market and customers undermines the competitiveness and productivity of firms (Tran et al. 2009). In general, the lack of institutional knowledge is a problem because it is difficult for enterprises to fully understand the laws and technical regulations for doing business (Nguyen et al. 2013).

Conclusion and implications

The study has analysed the spatial impact of institutional quality on firm performance in Vietnam. This impact makes enterprises in different localities compete for profit and promote each other through total factor productivity. The results reinforce our argument that institutional quality transcends provincial

administrative boundaries and spans multiple provinces. High-quality institutions affect firm performance in neighbouring provinces indirectly and through the performance of firms in the whole region. The study also finds that labour affects firm performance in a locality and in neighbouring localities; and fixed assets have a strong negative effect on the performance of firms in a locality and neighbouring localities. These are clear messages about the labour-intensive production and the technical backwardness of the Vietnamese economy. Without strong policies, it will be difficult for Vietnam to improve its economy through technological innovation.

The main implication of this study is that high-quality institutions in a locality will improve firm performance in many localities. Institutional quality affects the competitiveness of enterprises, and it transcends administrative boundaries. Furthermore, formal institutions are one of the prerequisites for companies to access necessary resources, and the more access by firms, the more they have survival and development opportunities (LiPuma et al. 2013). Therefore, this study shows that there is a difference in the economic effectiveness of provinces in the uniform legal environment in Vietnam. These findings show that Vietnam's localities should enhance their institutional quality to promote the development of firms in their respective locality and in neighbouring localities. Choi et al. (2015) argued that local government plays an important and sometimes decisive role in resource allocation. Differences in institutional quality across localities are an important indicator and a test base for national transformation. Therefore, the institutional and organisational characteristics of local governments may account for regional differentiation in the dynamics of industrial development (Choi et al. 2015).

The study has found that corruption control in a locality has a positive effect on the profits of enterprises in that locality and in neighbouring localities. However, increasing corruption controls hinder the productivity growth of firms in different provinces. While corruption can be the cost of playing the game

and helping companies survive in a transitional economy like Vietnam, strengthening the control of corruption can reduce costs and increase the profits of enterprises. Moreover, improving governance quality can limit the negative impacts of corruption on firm growth and development (Nguyen and van Dijk 2012; Robles 2017). Therefore,

determining how to meet the goals of increasing profits and improving productivity is significant in local policymaking. The important point is that provinces should closely coordinate improvements in public administration activities to reduce transaction costs of enterprises, and jointly build and improve institutions to improve the performance of firms.

References

- Acemoglu, D., Johnson, S. and Robinson, J.A., 2001. 'The colonial origins of comparative development: an empirical investigation', *The American Economic Review*, 91(5):1369–401.
- 2002. 'Reversal of fortune: geography and institutions in the making of the modern world income distribution', *The Quarterly Journal of Economics*, 117(4):1231–94.
- 2005. 'Institutions as the fundamental cause of long-run growth', in P. Aghion and S. Durlauf (eds.), *Handbook of Economic Growth*, Elsevier Press, North Holland:385–472.
- Acemoglu, D., Johnson, S., Robinson, J.A. and Thaicharoen, Y., 2003. 'Institutional causes, macroeconomics symptoms: volatility, crises, and growth', *Journal of Monetary Economics*, 50: 49–122.
- Agostino, M., Di Tommaso, M.R., Nifo, A., Rubini, L. and Trivieri, F., 2020. 'Institutional quality and firms' productivity in European regions', *Regional Studies*, 54:1–14.
- Baumöhl, E., Iwasaki, I. and Kočenda, E., 2019. 'Institutions and determinants of firm survival in European emerging markets', *Journal of Corporate Finance*, 58:431–53.
- Baumol, W.J., 1990. 'Entrepreneurship: productive, unproductive, and destructive', *Journal of Political Economy*, 98(5):893–921.
- Bhaumik, S.K., Dimova, R., Kumbhakar, S.C. and Sun, K., 2017. 'Is tinkering with institutional quality a panacea for firm performance? Insights from a semiparametric approach to modeling firm performance', *Review of Development Economics*, 22(1):1–22.
- Bologna, J., Young, A. and Lacombe, D., 2016. 'A spatial analysis of incomes and institutional quality: evidence from US metropolitan areas', *Journal of Institutional Economics*, 12(1):191–216.
- Cardoza, G., Fomes, G., Farber, V., Duarte, R.G. and Gutierrez, J.R., 2016. 'Barriers and public policies affecting the international expansion of Latin American SMEs', *Journal of Business Research*, 69(6):2030–9.
- Che, Y., Lu, Y. and Tao, Z., 2017. 'Institutional quality and new firm survival', *The Economics of Transition*, 25(3):495–525.
- Choi, J.J., Jiang, C. and Shenkar, O., 2015. 'The quality of local government and firm performance: the case of China's provinces', *Management and Organization Review*, 11(4):679–710.
- Dau, L.A., Moore, E.M. and Kostova, T., 2020. 'The impact of market based institutional reforms on firm strategy and performance: review and extension', *Journal of World Business*, 55(4): 101073.
- De Rosa, D., Nishaal, G. and Holger, G., 2015. 'Corruption and productivity: firm-level evidence', *Journal of Economics and Statistics (Jahrbuecher fuer Nationaloekonomie und Statistik)*, 235(2):115–38.
- Deng, P. and Zhang, S., 2018. 'Institutional quality and internationalization of emerging market firms: focusing on Chinese SMEs', *Journal of Business Research*, 92:279–89.
- Dubin, R., 2004. 'Spatial lag and spatial error revisited: some Monte Carlo evidence', in J.P. Lesage and R. Kelley Pace (eds.), *Spatial and Spatiotemporal Econometrics*, Emerald Group Publishing Limited, Bingley: 75–98.
- Easterly, W. and Levine, R., 2003. 'Tropics, germs, and crops: how endowments influence economic development', *Journal of Monetary Economics*, 50(1):3–39.
- Elhorst, J.P., 2003. 'Specification and estimation of spatial panel data models', *International Regional Science Review*, 26(3):244–68.
- 2010a. 'Spatial panel data models', in M.M. Fischer and A. Getis (eds.), *Handbook of Applied Spatial Analysis*, Springer, Berlin, Germany: 377–407.
- 2010b. 'Applied spatial econometrics: raising the bar', *Spatial Economic Analysis*, 5(1):9–28.

- 2012. 'Matlab software for spatial panels', *International Regional Science Review*, 37(3): 389–405.
- Epo, B.N. and Nochi Faha, D.R., 2020. 'Natural resources, institutional quality, and economic growth: an African tale', *The European Journal of Development Research*, 32:99–128.
- Faruq, H.A. and Weidner, M.L., 2018. 'Culture, institutions, and firm performance', *Eastern Economic Journal*, 44:519–34.
- Fidrmuc, J., Kapounek, S. and Siddiqui, M., 2017. 'Which institutions are important for firm performance? Evidence from Bayesian model averaging analysis', *Panoeconomicus*, 64(4):383–400.
- Ghoul, S., Guedhami, O. and Kim, Y., 2017. 'Country-level institutions, firm value, and the role of corporate social responsibility initiatives', *Journal of International Business Studies*, 48:360–85.
- Gokan, T., Kuroiwa, I. and Nakajima, K., 2019. 'Agglomeration economies in Vietnam: a firm-level analysis', *Journal of Asian Economics*, 62: 52–64.
- Görg, H. and Spaliara, M.E., 2014. 'Financial health, exports and firm survival: evidence from UK and French firms', *Economica*, 81(323):419–44.
- Hall, R.E. and Jones, C.I., 1999. 'Why do some countries produce so much more output per worker than others?', *Quarterly Journal of Economics*, 114(1):83–116.
- Hasan, I., Wachtel, P. and Zhou, M., 2009. 'Institutional development, financial deepening and economic growth: evidence from China', *Journal of Banking & Finance*, 33(1):157–70.
- Hu, C., Xu, Z. and Yashiro, N., 2015. 'Agglomeration and productivity in China: firm level evidence', *China Economic Review*, 33:50–66.
- Hung, H., 2008. 'Normalized collective corruption in a transitional economy: small treasuries in large Chinese enterprises', *Journal of Business Ethics*, 79:69–83.
- Hussen, M.S. and Çokgezen, M., 2020. 'The impact of regional institutional quality on firm innovation: evidence from Africa', *Innovation and Development*, 11:1–22.
- Kandil, M., 2009. 'Determinants of institutional quality and their impact on economic growth in the MENA region', *International Journal of Development Issues*, 8(2):134–67.
- Kayam, S.S., Yabrukov, A. and Hisarciklilar, M., 2013. 'What causes the regional disparity of FDI in Russia? A spatial analysis', *Transition Studies Review*, 20(1):63–78.
- Krugman, P., 1991. 'Increasing returns and economic geography', *Journal of Political Economy*, 99(3):483–99.
- LeSage, J.P. and Pace, R.K., 2009. *Introduction to Spatial Econometrics*, Boca Raton, Taylor & Francis Group.
- LiPuma, J.A., Newbert, S.L. and Doh, J.P., 2013. 'The effect of institutional quality on firm export performance in emerging economies: a contingency model of firm age and size', *Small Business Economics*, 40:817–41.
- Loayza, N.V., Rancière, R., Servén, L. and Ventura, J., 2007. 'Macroeconomic volatility and welfare in developing countries: an introduction', *World Bank Economic Review*, 21:343–57.
- Lou, Y., 2002. 'Corruption and organization in Asian management system', *Asia Pacific Journal of Management*, 19:405–22.
- McCulloch, N., Malesky, E. and Duc, N.N., 2013. 'Does better provincial governance boost private investment in Vietnam?', *IDS Working Papers*, 2013(414):1–27.
- Mori, T. and Smith, T., 2014. 'A probabilistic modeling approach to the detection of industrial agglomerations', *Journal of Economic Geography*, 14:547–88.
- Narooz, R. and Child, J., 2017. 'Networking responses to different levels of institutional void: a comparison of internationalizing SMEs in Egypt and the UK', *International Business Review*, 26(4):683–96.
- Nguyen, T.T. and van, Dijk, M.A., 2012. 'Corruption, growth, and governance: private vs. state-owned firms in Vietnam', *Journal of Banking & Finance*, 36:2935–48.
- Nguyen, V.T., Le, T.B.N. and Bryant, S.E., 2013. 'Sub-national institutions, firm strategies, and firm performance: a multilevel study of private manufacturing firms in Vietnam', *Journal of World Business*, 48:68–76.
- Nifo, A., Scalera, D. and Vecchione, G., 2017. 'The rule of law and educational choices: evidence from Italian regions', *Regional Studies*, 51(7): 1048–62.
- North, D.C., 1986. 'The new institutional economics', *Journal of Institutional and Theoretical Economics*, 142:230–7.
- 1990. *Institutions, Institutional Change, and Economic Performance*, Harvard University Press, Cambridge, MA.
- 1993. 'Institutions and credible commitment', *Journal of Institutional and Theoretical Economics*, 149:11–23.
- Peng, M.W., 2002. 'Towards an institution-based view of business strategy', *Asia Pacific Journal of Management*, 19:251–67.
- Perkins, S.E., 2014. 'When does prior experience pay? Institutional experience and the

- multinational corporation', *Administrative Science Quarterly*, 59(1):145–81.
- Robles, F., 2017. 'Institutional quality and agglomeration of fast-food multinationals in Latin American cities', *Management Research*, 15(3): 251–67.
- Sen, K. and Rajesh, R., 2017. 'Does institutional quality matter for firm performance? Evidence from India', *South Asia Economic Journal*, 18(2): 184–213.
- Scott, W.R., 1995. *Institutions and Organizations*, Sage, Thousand Oaks, CA.
- Shi, W.S., Markóczy, L. and Stan, C.V., 2014. 'The continuing importance of political ties in China', *Academy of Management Perspectives*, 28(1):57–75.
- Stoian, C. and Mohr, A., 2016. 'Outward foreign direct investment from emerging economies: escaping home country regulative voids', *International Business Review*, 25(5):1124–35.
- Tran, Q.T., Vu, V.H., Doan, T.T. and Tran, D.H., 2016. 'Corruption, provincial institutions and manufacturing firm productivity: new evidence from a transitional economy', *Estudios de Economia*, 43(2):199–215.
- Tran, T.B., Grafton, R.Q. and Kompas, T., 2009. 'Institutions matter: the case of Vietnam', *The Journal of Socio-Economics*, 38:1–12.
- Ugur, M., 2010. 'Institutions and economic performance: a review of the theory and evidence', *SSRN Electronic Journal* <https://doi.org/10.2139/ssrn.2102746>
- World Bank, 2017. *Vietnam - Enhancing Enterprise Competitiveness and SME Linkages: Lessons from International and National Experience*, The World Bank Group, Washington, DC.
- Wu, X., Gao, M., Guo, S. and Li, W., 2019. 'Effects of environmental regulation on air pollution control in China: a spatial Durbin econometric analysis', *Journal of Regulatory Economics*, 55(3): 307–33.
- Yasar, M., Paul, C.J.M. and Ward, M.R., 2011. 'Property rights institutions and firm performance: a cross-country analysis', *World Development*, 39(4):648–61.
- Zhang, Q., Shi, Y., He, A. and Wen, X., 2017. 'Property rights security and firm survival: micro-data evidence from China', *China Economic Review*, 44:296–310.