

## **LOCATION AND BUSINESS-LEVEL PRODUCT INNOVATION IN VIETNAM: REGIONAL DIFFERENCES AND DRIVERS**

**Declan Jordan**

Lecturer, School of Economics, University College Cork, Aras na Laoi, Cork, Ireland. E-mail: [d.jordan@ucc.ie](mailto:d.jordan@ucc.ie)

**ABSTRACT:** Using data from the Investment Climate Survey published by the World Bank, this paper estimates the determinants of business level product innovation in Vietnamese enterprises. In particular the paper sheds light on the effect of location on the likelihood of business-level innovation, while also controlling for business-specific factors. The paper also explores the relative importance of the drivers of business innovation across Vietnamese regions. It finds that businesses in the Red River Delta Region, which includes Hanoi, were significantly more likely to introduce new and upgraded products than businesses in other regions. The results suggest that the capital city region had an advantage over other regions for product innovation, challenging popular conceptions of Ho Chi Minh City as the engine of Vietnamese entrepreneurship. The results further suggest that place-based policies may be an important element of successful innovation policy in Vietnam, as they are in developed countries, and that a 'one-size-fits-all' approach to innovation supports is likely to be suboptimal.

**KEY WORDS:** Vietnam, Business Innovation, Location, Regional development

### **1. INTRODUCTION**

This paper focuses on the effects of location on business-level innovation in a rapidly developing economy, using business-level survey data from Vietnam. The paper sheds light on the types of businesses that are more likely to innovate, the extent to which regional location affects the likelihood of innovation and how regional location affects the determinants of innovation and the relationship between innovation inputs and outputs. The paper tests the hypothesis that there are location effects on business innovation using data from the 2005 Investment Climate Survey conducted by the World Bank. For Vietnam the paper specifically tests whether a capital city effect exists in relation to business-level innovation or whether innovative businesses are dispersed across the country.

Vietnam has demonstrated remarkable rates of economic growth in the last two decades, following the *doi moi* policy of economic openness introduced in 1986. The remarkable growth in economic activity in Vietnam has led to improvements in standards of living and reductions in poverty. The WorldBank (2013) states

“political and economic reforms (Doi Moi)... transformed Vietnam from one of the poorest countries in the world, with per capita income below \$100, to a lower middle income country within a quarter of a century with per capita income of \$1 130 by the end of 2010. The ratio of population in poverty has fallen from 58% in 1993 to 14.5% in 2008, and most indicators of welfare have improved.”

The Growth Commission identified 13 countries that have experienced periods of high, sustained growth post-WWII and noted that ‘Vietnam may be on [its] way to joining this group’ (2008:19). The Vietnamese economy is at a crucial stage of its development, having recently become a middle-income ranked country, and that policy-makers are currently debating what is required to enable the economy to remain on a favourable growth path (Bodewig and Badiani-Magnusson, 2014). The focus of that debate is the need to support businesses to become more competitive and productive. While the data used to explore the effects of location on business innovation was collected in 2005, and there have been significant changes in the Vietnamese economy and business sectors since the data was collected, it is nevertheless useful to test the effects of location on business innovation using evidence from a dynamic developing country, which Vietnam was at the time of the survey and still remains. Of course, economic research, by its nature, is backward-looking and, in a rapidly growing and changing country such as Vietnam, this poses difficulties for policy implications.

Rasiah (2011, p. 261), in discussing important policy implications from empirical studies on innovation and learning at business-level in industrialising East Asian economies, states that policy-makers must understand the conduct of innovators and non-innovators. This is consistent with the argument that as the Vietnamese economy develops and grows there must be a greater emphasis on productivity improvements rather than factor accumulation as the engine of further growth (Mishra, 2011).

This paper makes important contributions to understanding the extent to which the drivers of innovation in Vietnamese businesses may be affected by spatial considerations and the extent to which location affects innovation output. While the effects of urbanisation and localisation economies on business-level innovation have been widely researched for developed economies and regions, there is a lack of analysis of the relative importance of location for innovation in developing economies. There is no a priori reason to expect that the relationships and effects that apply in developed economies will also be observed in developing economies. Gellynck and Vermeire (2009, p. 732) warn against the extrapolation from one region to another and assert that socioeconomic context is important in understanding how regional factors support business networking and performance. Further, Hadjimichalis and Hudson (2006, p. 861) challenge the 'new orthodoxy' in business economics and economic geography surrounding the importance of regionally based networks for businesses. This paper hopes to contribute to this call by considering whether approaches for understanding the effect of location on business innovation are supported by research in a developing country.

Also, Tarp *et al.* (2003, p. 848) argue in the Vietnamese case that the design of appropriate policies requires adequate data and information on the structure of the economy. This paper seeks to contribute to enterprise and innovation policy in Vietnam by shedding light on business' innovation activities. This is an important policy area as Vietnam looks to build and maintain its strong growth performance.

The next section sets out the conceptual frameworks underpinning the work and address why location may be expected to affect business-level innovation. This is followed by a brief discussion of the Vietnamese context and why it is appropriate, given Vietnam's historical and regional development, to analyse the locational aspects of the drivers of innovation across regions. Then the data and methods used to estimate an innovation production function are presented followed by an interpretation of the results. The final section concludes.

## **2. SPATIAL INFLUENCES ON INNOVATION**

Malmberg and Maskell (2002) assert that the traditional sources of agglomeration are the existence of a localized skilled labour force, which reduces search costs for businesses in finding labour, and the availability of specialized intermediate inputs, which can be provided at a lower cost due to market size effects. While Krugman (1991, p. 53) argues that

economists should not attempt to measure knowledge spillovers as an agglomerating effect, since “knowledge flows are invisible, they leave no paper trail by which they may be measured and tracked”, knowledge spillovers are a critical element in several approaches to explaining regional differences in innovation activity. The argument that knowledge spillovers are spatially bounded has been encapsulated by Glaeser *et al.* (1992, p. 1127) who, in analysing the role of regional specialisation for the growth of cities, argue that “intellectual breakthroughs must cross hallways and streets more easily than oceans and continents”.

Capello (2014) presents a comprehensive review of the role of proximity in spatial innovation processes and van Oort and Lambooy (2014) survey the literature on the importance of urbanisation and knowledge spillovers for innovation. There is a substantial body of empirical work that supports the hypothesis that geographic proximity enhances interaction and networking and is positively associated with greater levels of innovation (Mate-Sanchez-Val and Harris, 2014; Hewitt-Dundas, 2013; Doran *et al.*, 2012b; Jordan and O’Leary, 2011; Narula and Santangelo, 2009). The idea that knowledge spillovers are spatially bounded emerged from models developed to explain aspects of the geographical concentration of economic activity. The first of these is the Growth Pole Model (Perroux, 1955; Perroux, 1988), a survey of which is presented in Parr (1999). The basis of this model is that large business or public location-specific investment can generate local growth. Local businesses, because of their proximity, increase sales to the new investor leading to growth in economic activity in the geographical area of the investment. While the benefits to the local economy are largely based on the market-based supply of goods and services, market-based or external knowledge spillovers from large public or private investment to smaller local businesses are also a significant benefit to the area in which the investment is located.

The Product Cycle Model, based on the product life cycle theory of Vernon (1966), contends that businesses separate activities by location based on the stage of development of the product. Businesses tend to locate knowledge-sensitive activities, such as research and development and the production of technologically new products, in places where important knowledge can be accessed more easily. This tends to favour geographical concentration of activity for products and processes based on new, non-standardized knowledge. These are products and processes at the start of their life cycle. Over time, production techniques and products tend to become better understood and the knowledge required is

increasingly standardized and more likely to be codified. In this situation the lower input costs in geographically peripheral areas outweigh the need for access to knowledge. McCann (2013) notes that this means that a qualitative distinction may exist between economic activity at the economic centre and periphery of geographical areas.

The growth pole model and the product life cycle model stress the role played by large businesses in generating growth in regions. The location decisions made by individual large businesses create the conditions for growth in particular regions. Other approaches stress the importance of concentrations of smaller businesses that interact and co-operate for innovation within a localized area. Localisation and urbanisation economies suggest that businesses may benefit from localized knowledge spillovers by being located within a concentration of economic activity (McCann, 2013; Parr, 2002). Moulaert and Sekia (2003) survey what they describe as the range of 'Territorial Innovation Models' which include industrial districts, innovative milieu, localized production systems, new industrial spaces, innovation clusters, regional innovation systems and learning regions. These models are based on interaction in the creation of a favourable innovation environment and stress the importance of proximity to facilitate interaction between businesses and institutions within the regions.

These frameworks stress the importance of interaction between businesses and institutions within the region as a source of innovation. The institutional set-up, including innovation-supporting agencies and academic researchers, facilitates sharing of knowledge between businesses and institutions and/or accessing knowledge that is available externally within the region. They suggest a hypothesis that a business will interact more frequently with interaction agents more proximate to it and that a business that interacts for innovation over shorter distances and/or is located in an urban area will, *ceteris paribus*, have greater levels of innovation.

### 3. VIETNAMESE CONTEXT

In 1986 the Vietnamese leadership adopted the programme of economic reform referred to as *doi moi*. This involved a move from central planning to a greater role for marketization and internationalisation in Vietnamese economic and business activity. Dutta (1995) presents a comprehensive description of the process of *doi moi* and the structural changes that resulted from the new direction. Ketels *et al.* (2010, p. 123) contend that Vietnam's dynamic economic growth since the mid-1980s has been

driven by a switch towards a market economy, greater openness to the global economy and sectoral structural shifts away from agriculture towards more productive sectors in manufacturing and services. They argue however that Vietnam's competitiveness is based on low cost labour and that this is ultimately limited in its potential to drive further growth.

Since Schumpeter (1942) identified the process of what he termed 'creative destruction' as the essential fact about capitalism, innovation has increasingly been seen as the driver of economic growth and development. Schumpeter (1942, p. 83) states that the "fundamental impulse that sets and keeps the capitalist engine in motion comes from new consumers' goods, the new methods of production or transportation, the new markets, the new forms of industrial organisation that capitalist enterprise creates". Later, Baumol (2002) identified innovation as the engine of growth in market economies.

Models of economic growth, both neo-classical and endogenous theories, imply a critical role for technological change in driving economic growth. Sena (2004, p. 312) notes that economists generally agree that total factor productivity growth is the main determinant of long-run economic growth, and that total factor productivity growth is closely linked to innovation in the economy. Therefore, in the context of an economy, such as Vietnam's, that has grown at a remarkable rate based primarily on low-cost labour and structural change, it is important to understand the dynamics of business-level innovation so that future growth based on productivity improvements can be supported.

A further important consideration is the spatial distribution of innovative activity in Vietnam. The strong economic growth performance of the Vietnamese economy has not been evenly distributed in space. The impressive rates of economic growth in Vietnam since the mid-1980s have occurred at the same time as greater levels of regional income inequality (Taylor, 2004; Ramachandran and Scott, 2009, p. 695). Scott and Chuyen (2004) present a comprehensive explanation of the social, political, cultural and economic factors underpinning imbalances in regional development in Vietnam. Cung *et al.* (2004) say that lagging northern regions are largely due to history, but this is less significant over time and persistent divergence is due to policy and cluster effects. Hayton (2010, p. 209) argues that in the opening economy seen since *doi moi* new foreign investors in Vietnam "found the south more conducive to business: less rule-bound, less ideological".

Vietnam's uneven spatial development has deep historical and socio-political roots. Ashwill and Thai (2005, p. 71) assert that Vietnam is 'actually three countries' derived from different histories and conditions. These three regions – *Tonkin* in the North, *Annam* in the centre, and *Cochin-China* in the south – do not correspond to the regions in this paper, but the different historical development and cultures within these 'regions' prompt questions on the effects of location on business performance. The country is also very decentralized from a governance perspective. There have been efforts to develop clusters of industries within specific regions in Vietnam. However, any policy intended to support the development of Vietnamese businesses has to be informed by evidence of the determinants of business innovation across the different regions. The results of this paper must be treated with some caution from a policy perspective due to the use of data from 2005. However, the paper tests the hypothesis, in a Vietnamese context, that location matters for innovation, and if this is indeed the case it suggests that policy-makers cannot ignore spatial effects and may require greater consideration of place-based policies.

#### 4. DATA AND METHOD

This paper uses data from the Investment Climate Survey 2005, a firm level survey of Vietnam undertaken by Concetti and the World Bank. This is the most recent publicly available business survey that includes information on business-level innovation and, crucially for this study, business location. The general purpose of the survey was to understand the investment climate in Vietnam and how it affected business performance. The survey contained questions on the origin and ownership status of a business, and questions related to finance (to examine financial constraints on production and expansion), technology (to assess the ease of access to new technologies), relations with other firms (to gauge the importance of associations and networks), government regulation, contract enforcement, labour relations, and international trade. Respondents were asked to indicate whether their business successfully developed a major new product line and whether the business upgraded an existing product line, providing measures of product innovation in these businesses.

The survey was administered in a stratified manner based on strata on firm size, business sector and geographic region. Firm size levels were 5-19 employees (small), 20-99 employees (medium), and more than 100 employees (large-sized firms). It is notable that in most developing

economies, including Vietnam, the majority of firms are small and medium-sized though the World Bank enterprise surveys oversample large firms since larger firms tend to be engines of job creation. Manufacturing sub-sectors were selected as additional strata on the basis of employment, value-added and total number of establishments. Geographic regions were selected based on which cities/regions collectively contain the majority of economic activity.



Figure 1: Vietnamese Regions. Source: Author's own based on map from Wikimedia.

Figure 1 shows the regions of Vietnam. Data is available for five of the eight regions. These include *Red River Delta*, *North Central Coast*, *South Central Coast*, *Southeast* and *Mekong River Delta*. The Vietnamese capital city, Hanoi, is located in the *Red River Delta* region and Ho Chi Minh City is located in the *Southeast* region. Table 1 presents the number and percentage of businesses located in each region. It can be seen that the largest proportion of businesses in the sample were located in the *Red River Delta* and *Southeast* regions, accounting for approximately a third of businesses each.



**Table 1.** Number and Percentage of Businesses and Product Innovators per Region.

<i>Region</i>	<i>Number of Businesses (%)</i>	<i>New Product Innovators (%)</i>	<i>Upgraded Product Innovators (%)</i>
Red River Delta	344 (30%)	191 (56%)	263 (77%)
Southern Central Coastal	152 (13%)	59 (39%)	107 (70%)
South East	392 (34%)	174 (44%)	238 (61%)
Mekong River Delta	115 (10%)	33 (29%)	56 (49%)
Northern Central	147 (13%)	47 (32%)	93 (63%)
Total	1 150 (100%)	504 (44%)	757 (63%)

Source: Author's calculations based on 2005 World Bank Enterprise Survey.

Table 2 presents a summary of descriptive statistics for a sample of variables in the dataset. The mean size of businesses in the sample was 342 employees and they were in operation for 12 years on average. The majority of the businesses in the sample were non-exporters. In relation to the human capital available to the businesses, 70 per cent of employees had at least high school education while half that number studied beyond high school.

**Table 2.** Descriptive Statistics.

<i>Variable (unit of measurement)</i>	<i>Mean</i>	<i>Standard Deviation</i>
Employment (Number of Employees)	342	822
Age (years)	12	12.85
R&D Expenditure in VNDm (EUR '000 equivalent)	94 (3.3)	1 165 (45.1)
Exporting firms (%)	41	
Employees with at least high education (%)	70	
Employees with education beyond high school (%)	35	

Source: Author's calculations based on 2005 World Bank Enterprise Survey.

This paper focuses on the knowledge transformation stage of the innovation value chain (Roper, Du, and Love, 2008) where internal and external knowledge is utilized to generate new products and processes. This paper uses an innovation production function to model enterprises' innovation decisions (Doran *et al.*, 2012a; Doran *et al.*, 2012b; McGuirk and Jordan, 2012; Oerlemans *et al.*, 2001; Roper, 2001; Roper *et al.*, 2008) The innovation production function describes the process whereby internal and external knowledge sources, as well as enterprise specific factors, condition the probability of innovation. This paper uses probit estimations of the innovation production function taking the following form:

$$IO_i = \beta_0 + \beta_1 R\&D_i + \beta_2 Z_i + \beta_3 L_i + \mu_i \quad (1)$$

In the equation,  $IO_i$  are binary indicators of product innovation in business  $i$ . Two product innovation measures are used. For new product innovation,  $IO_i$  takes a value of 1 where a business has developed successfully a major new product line in the three years from 2003 to 2005. For upgraded product innovation,  $IO_i$  takes a value of 1 where a business has upgraded an existing product line in the three years from 2003 to 2005.  $R\&D_i$  is an indicator of research and development (R&D) activity in business  $i$ , measured by the log of R&D expenditure. Previous studies have shown that enterprise specific factors can also impact on the propensity of innovation within firms. Therefore,  $Z_i$ , a range of business specific factors, is included. This vector of variables controls for the size of the business, the age of the business, the sector in which it operates, whether the business is located within an industrial zone, whether the businesses is an exporter, whether the business has been privatized from previous state ownership and the level of educational attainment of the workforce. It also includes an indication of whether the business perceives strong pressure from domestic and foreign competitors. All of these factors have previously been shown to have potential influences on enterprises' innovation decisions (Freel, 2003; Love and Mansury, 2007; Oerlemans *et al.*, 1998; Pavitt, 1984).  $L_i$  is an indicator of the region within which the business is located and is the particular focus of this paper.

To estimate the relative importance of the drivers of innovation across the regions, interaction variables are used. This suggests an innovation production function of the form:

$$IO_i = \lambda_0 + \lambda_1 L_i R\&D_i + \lambda L_i Z_i + \mu_i \quad (2)$$

## 5. RESULTS

Table 3 presents the results of a probit estimation of likelihood of product innovation, for both new products and upgraded products. The likelihood of introducing new products is positively associated with the size and age of the firm. Previously state-owned firms that have been privatized are more likely to introduce new products than state-owned firms and firms with a higher proportion of the workforce with at least high-school education are also more innovative. Firms that identified themselves as facing competitive pressure from foreign firms were more likely to introduce new products and medium-high technology firms were more likely to introduce new products than firms in low technology sectors.

In relation to upgraded products, larger businesses and those with more educated workforces were more likely to innovate. Privatized businesses were less likely than those that have not been privatized. This finding, in conjunction with the finding that privatized businesses introduced more new products, points to a difference in the way privatized and state-owned businesses product innovate. The state may be more inclined to retain those businesses that have greater monopoly power and these businesses may be larger on average. A lack of competitive pressure, coupled with a lack of incentive to enter new markets in state-owned businesses, is likely to favour incremental changes in existing products rather than more radical product innovation. In this context, it is also notable that, in a reversal of the situation in relation to new product innovation, businesses that indicated that they faced domestic competitive pressure are more likely to introduce upgraded products and there was no evidence of a difference in the likelihood of upgraded product innovation among those facing foreign competitive pressures. This may reflect the nature and sophistication of the domestic market where upgraded products are more targeted at domestic consumers than new products. It is more likely that state-owned businesses will face less competitive pressure, and may be more engaged in the domestic market than foreign markets.

**Table 3.** Probit Estimation of the Likelihood of Introducing New and Upgraded Products (Marginal Effects – Standard Errors in Parentheses).

	New Product	Upgraded Product
Log of R&D Expenditure	0.0104 (0.0140)	-0.0122 (0.0156)
Log of Employment	0.0441*** (0.0131)	0.06344*** (0.0129)
Age of the Firm	0.0037** (0.0018)	-0.0011 (0.0019)
Exporting Firm	0.0199 (0.0377)	-0.0002 (0.0365)
Industrial Zone	0.0024 (0.0525)	-0.0141 (0.0504)
Privatized	0.0756* (0.0525)	-0.0830* (0.0480)
Education Workforce	0.0019*** (0.0006)	0.0010* (0.0006)
Domestic Pressure	-0.0340 (0.0364)	0.0776** (0.0358)
Foreign Pressure	0.0882*** (0.0355)	0.0356 (0.0354)
<b>Sector<sup>2</sup></b>		
Medium-Low Tech Sector	-0.0356 (0.0415)	0.0576 (0.0396)
Medium-High Tech Sector	0.1334*** (0.0534)	0.1001** (0.0480)
Other	0.0913 (0.0735)	0.1802*** (0.0534)
<b>Region<sup>3</sup></b>		
Southern Central Coastal	-0.1478*** (0.0512)	-0.0430 (0.0534)
South East	-0.0924** (0.0429)	-0.1424*** (0.0458)
Mekong River Delta	-0.2247*** (0.0510)	-0.0257*** (0.0643)
Northern Central	-0.1779*** (0.0556)	-0.1318** (0.0672)
<b>Pseudo R<sup>2</sup></b>	0.0702	0.0817
<b>Observations</b>	906	905
<b>Wald Chi<sup>2</sup> (P Value)</b>	82.27 (0.0000)	87.96 (0.0000)

Notes: 1. \*\*\* Significant at 99% \*\* Significant at 95% \* Significant at 90% 2. The reference sector is Low-Tech 3. The reference region is Red River Delta. Source: the Author.

Of particular interest in this paper, the regional variables indicated that firms in all regions were less likely to introduce new products than firms in the Red River Delta region, which includes Hanoi. This suggests that there is a positive capital city effect for business-level innovation in Vietnam. While the coefficient was lowest for the South-East region, which includes Ho Chi Minh City, it is notable that businesses in this region were less likely to introduce new products than business in the Red River Delta. For upgraded product innovation, there were again regional differences as businesses in all regions, with the exception of the Southern Central Coastal region, were less likely than businesses in the capital city region to introduce new products. This suggests that there was a strong capital city effect in relation to innovation at the time of the survey. Hanoi and its surrounding region outperformed all of the other regions in terms of the introduction of new and upgraded products. The popular notion that the south of Vietnam, and Ho Chi Minh City in particular, was (and continues to be) the entrepreneurial driver of the Vietnamese economy is challenged by these findings. It may be that Hanoi, as the centre of political power since reunification, attracted greater investment, including public investment in infrastructure, physical and human capital. It may be that Ho Chi Minh City and the southern regions will overcome the initial capital city advantage, though these results suggest that this advantage at least persisted until the mid-2000s.

The analysis is developed further by considering whether there were differences in the relative importance of drivers of innovation across the Vietnamese regions. Table 4 reports the results of a probit estimation of the likelihood of introducing new and improved products using interaction variables as presented in equation (2) above.

For new product innovation, businesses in the South East Region (including Ho Chi Minh City) that were larger and facing greater foreign competitive pressure were more likely to innovate than corresponding businesses in the capital city region. Privatized businesses in the South East Region were less likely than their counterparts in the capital region to innovate with new products. Exporters in the Mekong River Delta Region were less likely to introduce new products and North Central businesses facing foreign competitive pressure were more likely to introduce new products than corresponding capital city region businesses.

For upgraded products, larger businesses across most regions were more likely to innovate than those in the capital. Privatized businesses in the capital were more likely to innovate than privatized businesses in each of the other regions. Both exporting businesses and those facing

domestic competitive pressure were more innovative in upgrade products than similar capital businesses.

Perhaps the most notable feature of the estimations presented in Table 4 however, was the lack of statistical significance across the majority of variables. This suggests that, while there were differences across regions in the relative importance of the determinants of product innovation, there was no evidence of systematic differences across the regions in how businesses product innovate.

**Table 4.** Probit Estimation of the Probability of Introducing New and Upgraded Products (Marginal Effects – Standard Errors in Parentheses).

	<b>New Product</b>	<b>Upgraded Product</b>
R&D x SouthCCoast	0.058 (0.047)	0.058 (0.057)
R&D x SouthE	0.038 (0.032)	-0.023 (0.026)
R&D x MKRD	-	-0.008 (0.044)
R&D x NorCen	-0.043 (0.086)	-
Size x SouthCCoast	0.018 (0.03)	0.049 (0.034)
Size x SouthE	0.038 (0.018)**	0.048 (0.034)***
Size x MKRD	0.019 (0.040)	0.090 (0.019)**
Size x NorCen	-0.019 (0.04)	0.080 (0.046)*
Age x SouthCCoast	-0.008 (0.008)	0.003 (0.008)
Age x SouthE	0.002 (0.002)	-0.001 (0.003)
Age x MKRD	0.015 (0.01)	0.008 (0.009)
Age x NorCen	0.005 (0.005)	-0.002 (0.005)
Exporter x SouthCCoast	0.16 (0.13)	0.013 (0.096)
Exporter x SouthE	-0.035 (0.061)	-0.049 (0.063)
Exporter x MKRD	-0.22 (0.109)**	-0.088 (0.135)
Exporter x NorCen	0.07 (0.11)	0.227 (0.063)***
Ind Zone x SouthCCoast	-0.133 (0.09)	-0.133 (0.090)
Ind Zone x SouthE	-0.067 (0.062)	0.003 (0.064)
Ind Zone x MKRD	-0.192 (0.154)	-0.164 (0.159)

**Table 4.** (Continued).

	<b>New Product</b>	<b>Upgraded Product</b>
Ind Zone x NorCen	-0.14 (0.157)	-0.233 (0.166)
Privatize x SouthCCoast	-0.12 (0.0944)	-0.144 (0.086)*
Privatize x SouthE	-0.134 (0.059)**	-0.246 (0.0645)***
Privatize x MKRD	-0.184 (0.129)	-0.0399 (0.146)***
Privatize x NorCen	0.043 (0.118)	-0.026 (0.124)
Education x SouthCCoast	0.002 (0.002)	0.001 (0.002)
Education x SouthE	0.001 (0.001)	0.001 (0.001)
Education x MKRD	0.002 (0.002)	0.001 (0.002)
Education x NorCen	-0.0003 (0.002)	-0.003 (0.002)
Dom Pressure x SouthCCoast	-0.045 (0.107)	0.075 (0.099)
Dom Pressure x SouthE	0.006 (0.06)	0.033 (0.059)
Dom Pressure x MKRD	0.153 (0.129)	0.094 (0.101)
Dom Pressure x NorCen	-0.130 (0.09)	0.196 (0.072)**
For Pressure x SouthCCoast	0.276 (0.11)	0.048 (0.104)
For Pressure x SouthE	0.06 (0.064)**	0.051 (0.06)
For Pressure x MKRD	0.209 (0.146)	0.271 (0.071)***
For Pressure x NorCen	0.243 (0.118)**	0.157 (0.092)
<b>Sector</b>		
Medium-Low Tech Sector	-0.02 (0.041)	0.074 (0.039)*
Medium-High Tech Sector	0.143 (0.054)***	0.104 (0.047)**
Other	0.119 (0.076)	0.200 (0.053)***
Pseudo R <sup>2</sup>	0.0800	0.1074
Observations	902	903
Wald Chi <sup>2</sup> (P Value)	85.93 (0.0000)	117.76 (0.0000)

Note: \*\*\* Significant at 99% \*\* Significant at 95% \* Significant at 90%. Source: the Author.

## **6. CONCLUSION**

This paper explores the relative innovation performance of businesses across Vietnamese regions. Using data from the World Bank Enterprise Survey, it finds distinct differences in the likelihood of new and updated product innovation in Vietnamese regions. There is a significant capital city region effect. This is surprising given the perception that southern Vietnam has been considered more entrepreneurial and conducive to business. Businesses in the Red River Delta Region, which includes the capital, Hanoi, are more likely than businesses in every other region to introduce new products and upgraded products.

The paper also examines whether there are differences across regions in the relative importance of the drivers of business-level innovation. There is evidence of differences in the effects of some factors in the likelihood of innovation, such as larger businesses and those with self-reported foreign competitive pressure in the South east Region, there is little evidence of systematic differences in the drivers of innovation across the businesses in the sample.

The results have implications for policymakers interested in supporting business innovation in Vietnam. While the age of the survey data used in this analysis means that policy implications must be treated with caution, the results highlight that location matters for business innovation and that there are other important factors impacting on Vietnamese businesses' innovation activities. It is hardly surprising that businesses that are exposed to foreign competitive pressures and that have more educated workforces are more likely to innovate in new products. Investment in training support and human capital development will enhance innovative capacity and, while businesses should be encouraged to compete internationally, they should be supported in this to facilitate product innovation.

Perhaps most importantly is that policymakers must recognize that location is an important factor for business innovation and to improve prospects for more even regional development. The results suggest that the capital city region, at the very least, led the other regions in product innovation (further research using more contemporary data can examine whether this advantage persists). The results suggest that place-based policies may be an important element of successful innovation policy in Vietnam, as they are in developed countries, and that a 'one-size-fits-all' approach to innovation supports is likely to be suboptimal. The findings in this paper also suggest a clear research agenda in exploring spatial and



agglomeration effects on business innovation in developing countries as more contemporary and, potentially, longitudinal data becomes available.

## REFERENCES

- Ashwill, M.A. and Thai, N.D. (2005). *Vietnam Today: A Guide to a Nation at a Crossroads*. Intercultural Press.
- Baumol, W.J. (2002). *The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism*. Princeton university press.
- Bodewig, C. and Badiani-Magnusson, R. (2014). *Skilling up Vietnam: Preparing the Workforce for a Modern Market Economy*. World Bank Publications.
- Capello, R. (2014). 4 Proximity and Regional Innovation Processes: is There Space for New Reflections? *Regional Development and Proximity Relations*, 163.
- Cung, N.D., Tuan, P.A., Van, B. and Dapice, D. (2004). History or Policy: Why Don't Northern Provinces Grow Faster? *United Nations Development Programme*.
- Doran, J., Jordan, D. and O'Leary, E. (2012a). The Effects of National and International Interaction on Innovation: Evidence from the Irish CIS: 2004–06. *Industry and Innovation*, 19(5), pp. 371-390.
- Doran, J., Jordan, D. and O'Leary, E. (2012b). The Effects of the Frequency of Spatially Proximate and Distant Interaction on Innovation by Irish SMEs. *Entrepreneurship & Regional Development*, 24(7-8), pp. 705-727.
- Dutta, M. (1995). Vietnam: Marketization and Internationalization of its Economy. *Journal of Asian Economics*, 6(3), pp. 311-326.
- Freel, M. (2003). Sectoral Patterns of Small Firm Innovation, Networking and Proximity. *Research Policy*, 32(5), pp. 751-770.
- Gellynck, X. and Vermeire, B. (2009). The Contribution of Regional Networks to Innovation and Challenges for Regional Policy. *International Journal of Urban and Regional Research*, 33(3), pp. 719-737.
- Glaeser, E.L., Kallal, H.D., Scheinkman, J.A. and Shleifer, A. (1992). Growth in Cities. *Journal of Political Economy*, 100(6), pp. 1126-1152.
- Growth Commission (2008). *The Growth Report*: Washington, DC: World Bank.
- Hadjimichalis, C. and Hudson, R. (2006). Networks, Regional Development and Democratic Control. *International Journal of Urban and Regional Research*, 30(4), pp. 858-872.
- Hayton, B. (2010). *Vietnam: Rising Dragon*. Yale University Press.

- Hewitt-Dundas, N. (2013). The Role of Proximity in University-Business Cooperation for Innovation. *The Journal of Technology Transfer*, 38(2), pp. 93-115.
- Jordan, D., and O'Leary, E. (2011). The Role of External Interaction for Innovation in Irish High-Technology Businesses. *The International Journal of Entrepreneurship and Innovation*, 12(4), pp. 248-256.
- Ketels, C., Nguyen, D.C., Nguyen, T.T.A. and Hanh, D.H. (2010). Vietnamese Competitiveness Report. Singapore: Asia Competitiveness Institute.
- Krugman, P.R. (1991). *Geography and trade*: MIT press.
- Love, J. and Mansury, M. (2007). External Linkages, R&D and Innovation Performance in US Business Services. *Industry and Innovation*, 14(5), pp. 477-496.
- Malmberg, A. and Maskell, P. (2002). The Elusive Concept of Localization Economies: Towards a Knowledge-Based Theory of Spatial Clustering. *Environment and planning A*, 34(3), pp. 429-450.
- Mate-Sanchez-Val, M. and Harris, R. (2014). Differential Empirical Innovation Factors for Spain and the UK. *Research Policy*, 43(2), pp. 451-463.
- McCann, P. (2013). *Modern Urban and Regional Economics*. Oxford University Press.
- McGuirk, H. and Jordan, D. (2012). Local Labour Market Diversity and Business Innovation: Evidence from Irish Manufacturing Businesses. *European Planning Studies*, 20(12), pp. 1945-1960.
- Mishra, Deepak. (2011). *Vietnam development report 2012: Market economy for a middle-income Vietnam*. Washington, DC: World Bank. Online version accessed 30 August, 2015, <http://documents.worldbank.org/curated/en/2011/12/15546780/vietnam-development-report-2012-market-economy-middle-income-vietnam>.
- Moulaert, F., and Sekia, F. (2003). Territorial innovation models: a critical survey. *Regional Studies*, 37(3), 289-302.
- Narula, R. and Santangelo, G.D. (2009). Location, Collocation and R&D Alliances in the European ICT Industry. *Research Policy*, 38(2), pp. 393-403.
- Oerlemans, L., Meeus, M. and Boekema, F. (1998). Do Networks Matter for Innovation? The Usefulness of the Economic Network Approach in Analysing Innovation. *Journal of Economic and Social Geography*, 89(3), pp. 298-309.

- Oerlemans, L.A., Meeus, M.T. and Boekema, F.W. (2001). Firm Clustering and Innovation: Determinants and Effects. *Papers in regional science*, 80(3), pp. 337-356.
- Parr, J.B. (1999). Growth-pole Strategies in Regional Economic Planning: A Retrospective View Part 1. Origins and Advocacy. *urban Studies*, 36(7), pp. 1195-1215.
- Parr, J. B. (2002). Missing Elements in the Analysis of Agglomeration Economies. *International Regional Science Review*, 25(2), pp. 151-168.
- Pavitt, K. (1984). Sectoral Patterns of Technical Change: Towards a Taxonomy and Theory. *Research Policy*, 13(6), pp. 343-374.
- Perroux, F. (1955). Note Sur La Notion de Pole de Croissance, *Economic Applique* 8 (1-2), Jan.-June, 397-20; Also, idem (1955), *Economic Space Theory and Application. Quarterly Journal of Economics*.
- Perroux, F. (1988). The pole of development's new place in a general theory of economic activity. *Regional Economic Development. Essays in Honour of Francois Perroux. Unwin Hyman Ltd., London*, 48-76.
- Ramachandran, L. and Scott, S. (2009). Single-Player Universities in the South: The Role of University Actors in Development in Vietnam's North Central Coast Region. *Regional Studies*, 43(5), pp. 693-706.
- Rasiah, R. (2011). Epilogue: Implications from Industrializing East Asia's Innovation and Learning Experiences. *Asia Pacific Business Review*, 17(02), pp. 257-262.
- Roper, S. (2001). Innovation, Networks and Plant Location: Some Evidence for Ireland. *Regional Studies*, 35(3), pp. 215-228.
- Roper, S., Du, J. and Love, J.H. (2008). Modelling the Innovation Value Chain. *Research Policy*, 37(6), pp. 961-977.
- Schumpeter, J. A. (1942). *Socialism, Capitalism and Democracy*: Harper and Brothers.
- Scott, S. and Chuyen, T.T.K. (2004). Behind the Numbers: Social Mobility, Regional Disparities, and New Trajectories of Development in Rural Vietnam. *Social inequality in Vietnam and the challenges to reform*, pp. 123-165.
- Sena, V. (2004). The Return of the Prince of Denmark: A Survey on Recent Developments in the Economics of Innovation. *The Economic Journal*, 114(496), pp. F312-F332.

- Tarp, F., Roland-Holst, D. and Rand, J. (2003). Economic Structure and Development in an Emergent Asian Economy: Evidence from a Social Accounting Matrix for Vietnam. *Journal of Asian Economics*, 13(6), pp. 847-871.
- Taylor, P. (2004). Redressing Disadvantage or Re-Arranging Inequality? Development Interventions and Local Responses in the Mekong Delta. *Social Inequality in Vietnam and the Challenges to Reform*, pp. 236-270.
- van Oort, F.G. and Lambooy, J.G. (2014). Cities, Knowledge, and Innovation *Handbook of Regional Science* (pp. 475-488): Springer.
- Vernon, R. (1966). International Investment and International Trade in the Product Cycle. *The Quarterly Journal of Economics*, pp. 190-207.
- WorldBank. (2013). Vietnam Overview. Online version accessed 19 November, 2014, <http://www.worldbank.org/en/country/vietnam/overview>.