

The effects of networks and autonomy on foreign-owned subsidiary competence development in Taiwan

The effects of
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autonomy

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Abstract

Purpose – The purpose of this paper is to investigate the role of networks and autonomy in competence development of foreign-owned subsidiaries (FOS) located in Taiwan.

Design/methodology/approach – Survey data have been collected from FOS located in the mid-range emerging economy of Taiwan and analysed using structured equation modelling and fuzzy set qualitative comparative analysis (fsQCA) techniques.

Findings – The results show that decision-making autonomy and intra-organisational networks are important factors for primary and support competence development. However, by using fsQCA technique the authors also show that many subsidiaries differ from that main pattern. For instance, local business and non-business networks can also contribute to primary competence development, but only in high autonomy subsidiaries.

Originality/value – The originality of this paper lies in the detailed investigation of how fine grained network relationship strengths (intra-, business-, non-business local networks) affect different levels of subsidiary competencies (primary and support activities). The authors also provide novelty in applying a combination of symmetric (structural-equation modelling – partial least squared) and non-symmetric (fsQCA) analytical techniques.

Keywords Networks, Taiwan, FsQCA, Foreign-owned subsidiaries, Competencies, Subsidiary autonomy

Paper type Research paper

1. Introduction

Increasing international competition has raised the profile of foreign-owned subsidiaries (FOS) in the wider literature on multinational enterprises over the last two decades (Verbeke *et al.*, 2016). This is because FOS's host finely sliced and globally dispersed value adding activities that are key for the sustainment of competitive advantages in the multinational as a whole (Rugman and Verbeke, 2001; Nanda and Panda, 2018). Globally dispersed value adding activities are the key pillars of a competence network that adds a new layer of complexity on how multinationals align structure and strategy to the changing environments of the global economy (Venai *et al.*, 2005; Liu *et al.*, 2017). It is therefore important to understand the organisational structures and strategies that influence competence development in FOS.

Previous subsidiary development literature has been criticised for focussing on either a too narrow or too wide set of competencies which do not reflect the current ability of multinationals to finely slice and globally distribute value adding activities within their networks (Verbeke *et al.*, 2016). Hence, we address that issue in also adding to the theoretical discussion on the transferability and development of value adding activities in subsidiaries (Rugman and Verbeke, 2001; Hutzschenreuter and Matt, 2017) in that we are one of the first studies to explicitly show how the development of multilevel value adding activities are affected in distinct ways by decision-making autonomy and network dimensions (Beugelsdijk and Jindra, 2018). Practically, this also implies guidance for managers and policy makers. For instance, the former might be guided in channelling their scarce



managerial resources (Birkinshaw *et al.*, 2005) towards kind of networks that foster competence development at the desired level, i.e. support or primary value adding. Policy makers can develop an understanding of how they can attract and nurture networks that drive competence development at a level that is conducive to local economic development (Narula and Pineli, 2017; Marini Thomé *et al.*, 2017). Furthermore, many network studies focus on either intra- or inter-organisational relationships, but neglect that both sides of the network are important for competence development (Andersson *et al.*, 2002; Chiao and Ying, 2013; Achcaoucaou *et al.*, 2014). We address that shortcoming and expand the discussion by being among the few studies that further distinguish between local business and non-business network actors. This is important because both because business and non-business actors can have distinct influence on subsidiary development (Dahms, 2015). Additionally, previous studies focus mostly on developed countries and somewhat ignore the increasingly important emerging market economies (e.g. Gammelgaard *et al.*, 2012; Filippov and Duysters, 2014). We address this issue with a comprehensive survey of FOS located in the mid-range emerging economy of Taiwan. Lastly, there have been also raised methodological concerns in suggesting that there might be several ways to achieve competence development in FOS (Rugman and Verbeke, 2001; Achcaoucaou *et al.*, 2014), however, equifinality cannot be appropriately captured by the utilisation of symmetric regression techniques alone (Fiss, 2007; Richter *et al.*, 2016). Hence, we include fuzzy set qualitative comparative analysis as a complement to standard structured equation model technique.

This paper develops and empirically tests a conceptual framework based on network theory, the competence view of the firm and decision-making autonomy. In particular, we aim to provide an explanation on how decision-making autonomy affects network structures of the subsidiaries, which in turn affect their competence development in finely sliced value chain activities. We aim to contribute to current literature on subsidiary competence development in the following ways. First, we incorporate theoretically and empirically test finely sliced value adding activities. In particular, we test subsidiary competencies in primary (e.g. sales) and support (e.g. human resource management) activities. Thus, we provide more detail compared to earlier studies which relied on patent citation analysis (Frost, 2001). At the same time, we provide broader insights than studies which limit their focus on a specific area of the value chain such as marketing (Nguyen, 2014; Dahms, 2015) or certain technological aspects (Andersson *et al.*, 2002; Chiao and Ying, 2013; Borini *et al.*, 2016). Second, we distinguish between different kinds of network actors. In addition to the more common differentiation between inter- and intra-organisational network relationships (e.g. Gammelgaard *et al.*, 2012), we also distinguish between business and non-business networks in the host country (Monaghan *et al.*, 2014). Third, we investigate FOS located in the mid-range emerging economy of Taiwan. The focus on FOS located in emerging economies is important because it allows us to test theoretical predictions developed in mature market contexts in the increasingly vital emerging markets (Wright *et al.*, 2005). Lastly, we supplement our results from the structured equation model with fuzzy set qualitative comparative analysis (fsQCA) to include equifinality considerations (Fiss, 2007; Cuervo-Cazurra *et al.*, 2016; Kingkaew and Dahms, 2018).

2. Theory and hypothesis development

2.1 Competence development in FOS

Competencies are herein seen as tangible and intangible assets (Prahalad and Hamel, 1990) distributed among their network of subsidiaries from which multinational enterprises derive their competitive edge (Dunning and Lundan, 2008; Narula, 2014). Following Birkinshaw *et al.* (1998) we investigate competence development from a subsidiary specific advantage point of view. Hence, subsidiary competences can contribute to the development

of competitive advantages for the whole of the MNE (Rugman and Verbeke, 2001). This departs from the more traditionally applied headquartered centric perspective (Hennart, 2009), on three key dimensions. First, not all competencies originate exclusively from the headquarters (Narula, 2014). Second, competencies are associated with value adding activities; hence, subsidiary competence development should be investigated along finely sliced value chain activities (Verbeke *et al.*, 2016). Third, subsidiaries located in emerging markets might develop new competencies that might not be instantly transferable throughout the whole of the multinational network, but still contain crucial building blocks for competence development in other subsidiaries located in similar host countries (Doz *et al.*, 2001).

Accordingly, we distinguish competencies along two dimensions which we term as primary and support competencies. Our classification is based on the classic value chain as introduced by Porter (1985) and refined in foreign-owned subsidiary development literature (Rugman and Verbeke, 2001; Achcaoucaou *et al.*, 2014). As primary competencies we might categorise activities such as sales and distribution, auxiliary services or production activities. Those are more likely to be found in FOS with lower levels of high-skilled labour requirements and in more foot-loose investments often associated with emerging market locations (Delany, 2000; Nguyen, 2014). Second, supporting competencies might emerge from activities such as research and development, human resource management or purchasing. Those value chain activities are still seen as exceptions when found in FOS due to their higher fixed costs and the required greater local commitment (Moore, 2001). We will discuss the impact of networks and autonomy on each competence dimension next.

2.2 Networks and subsidiary competence development

Network theory is seen as a key pillar in understanding subsidiary development (Ghoshal and Bartlett, 1990; Yamin and Andersson, 2011; Achcaoucaou *et al.*, 2014). Initially the concept has been borrowed from sociology (e.g. Granovetter, 1983) but has since been well integrated in existing international business frameworks. Networks are seen in this paper as social structures between a number of actors and the relationships between them describe the link between those network actors (Gammelgaard *et al.*, 2012). Granovetter (1985) argued that strong network relationships between actors' leads to a build-up of trust and can hence reduce the costs of transaction. This notion of reduced transaction cost through relationship building has since been emphasised in subsequent subsidiary development research (Andersson *et al.*, 2001; Yamin and Andersson, 2011; Chiao and Ying, 2013).

For this research, we follow and extend the network categorisation by Ghoshal and Nohria (1997) who suggest that subsidiaries are linked to intra- and inter-organisational networks. Those have been often investigated in isolation of each other (e.g. Andersson *et al.*, 2001; Yamin and Andersson, 2011; Gammelgaard *et al.*, 2012). Intra-organisational relationships comprise relationships with actors inside the multinational network such as headquarters, science centres, or other peer subsidiaries. Inter-organisational relationships consist of actors outside the multinational networks such as universities and local government agencies, or local buyers and suppliers. In line with Monaghan *et al.* (2014) and Dahms (2015), we extend inter-organisational networks and distinguish between non-business and business local networks.

2.2.1 Intra-organisational relationships and competence development. Intra-organisational relationships allow the subsidiary to link into the knowledge base of the whole MNE network (Rugman and Verbeke, 2001; Liu *et al.*, 2017). Those relationships are therefore regarded as the most crucial links for competence development since the multinational itself controls certain firm specific advantages that are crucial for outperforming host country competitors (Hennart, 2009). A subsidiary can develop its competencies by utilising strong intra-organisational relationships in accessing relevant

firm specific knowledge, or more broadly to gain access to international resources at lower transaction costs (Monteiro *et al.*, 2008). This allows for a recombination of local and multinational enterprise specific advantages (Rugman and Verbeke, 2001).

However, so far few studies seem to have investigated the effect intra-organisational network strength can have on different level of competence development, in our case support and primary competencies. Strong intra-organisational relationships have been shown to increase the visibility of the subsidiary within the MNE and therefore the likelihood of attracting repeat investments from the headquarters (Phelps and Fuller, 2000; Bouquet and Birkinshaw, 2008). Stronger integration can also create resource dependencies which can lead to other units of the network become increasingly dependent on the focal subsidiary for competencies or other tangible and intangible asset flows (Monteiro *et al.*, 2008). This might in particular affect the development of competencies in support value adding activities since those require far greater resource commitments from the MNE and the subsidiary.

On the other hand, a subsidiaries relative competence in primary value adding activities might also gain from strong intra-organisational relationships. This might be because of the distinct characteristics of emerging markets. For instance, subsidiaries located in emerging markets might face market conditions very different from those in the home country of the MNE but similar to those in other emerging markets. Hence, the required adaptation of company practises to local requirements is much greater compared to the home country (Rugman and Verbeke, 2001). A stronger integration to the intra-organisational network might therefore facilitate a knowledge exchange with other subsidiaries located in similar markets and hence strengthen the primary competence development of the subsidiary (Nguyen, 2014). For instance, a US company might develop a sales practise in Taiwan, which might be successfully transferred to certain areas of China. This leads to our first hypothesis:

- H1. There is a positive association between intra-organisational network strength and relative (primary and support) competence development in subsidiaries.

2.2.2 Inter-organisational relationships and competence development. Links with local economic actors provide access to location specific knowledge that is not available to other units within the multinational network (Rugman and Verbeke, 2001). That means such relationships can become an important source of knowledge for the rest of the network. On the other hand, local knowledge might not be of much use to other units in the network because of lacking compatibility for instance (Achcaoucaou *et al.*, 2014). Furthermore, external network links are also expensive when measured in management resources required to develop such links (Yamin and Andersson, 2011). In this paper, we extend that discussion by looking into more depth on what kind of inter-organisational networks subsidiaries access. In particular, in line with Monaghan *et al.* (2014) and Dahms (2015) we distinguish non-business related and business related local networks.

Non-business network relationships consist of links to local government agencies or local universities for example. Government agencies can provide support in gaining knowledge about the local business landscape and reduce related costs of transaction (Phelps and Fuller, 2000). This can impact the development of primary, e.g. sales competencies in the subsidiary. Furthermore, local universities provide crucial human capital and multinationals can even have an impact on their curriculum development (Monaghan *et al.* 2014), which can nurture the supporting competencies of the subsidiary. For instance, an increase in applied research can foster innovation which in turn can spill over in the subsidiary and vice versa (Achcaoucaou *et al.*, 2014).

Local business networks can provide competencies in their expertise on dealing with local suppliers for instance. This is in particular crucial in emerging markets with

potentially less developed infrastructure and quality control processes. Hence, it could positively affect the relative purchasing competence in the subsidiary, which is a supporting value added competence. Local customers can provide clues to best practise that can later on be transferred to other parts of the network, and hence, increasing the relative sales and production competence of the subsidiary:

H2. There is a positive association between non-business network strength and relative (primary and support) competence development in subsidiaries.

H3. There is a positive association between local business network strength and (primary and support) competence development in subsidiaries.

2.2.3 Inter-organisational and intra-organisational relationships. Previous studies showed that inter- and intra-organisational relationships do not exist independently of each other but are seen as interdependent (Yamin and Andersson, 2011; Gammelgaard *et al.*, 2012; Achcaoucaou *et al.*, 2014). However, those findings have so far been mostly based on studies in developed country settings. We therefore expand the argumentation somewhat in order to fit with emerging market realities.

For instance, strong intra-organisational relationships provide access to a wide experience and knowledge resources of the multinational. This knowledge and resource pool is likely to equip the subsidiary with practises that help gaining access to local non-business or local business networks. For instance, experiences from other potentially similar locations can be accessed by the subsidiary and subsequently adopted to local requirements. Hence, stronger intra-organisational relationships help to reduce cost of transaction with local actors, as compared to subsidiaries with less access to companywide knowledge resources:

H4a. There is a positive association between intra-organisational network strength and non-business network strength.

H4b. There is a positive association between intra-organisational network strength and local business network strength.

2.3 Autonomy and competence development

Autonomy refers to the freedom in strategic decision making the management of the subsidiary has without having to consult headquarters (Edwards *et al.*, 2002; Chiao and Ying, 2013). For instance, if a subsidiary can decide about changes to the product design or the market scope of that product without having to refer to the corporate headquarters, it is said to have greater decision-making autonomy.

The subsidiary role literature has provided us with great insights into the links between autonomy and competencies in the subsidiary. For instance, Holm and Pedersen (2000) showed that Scandinavian companies grant more decision-making autonomy to subsidiaries that have a centre of excellence mandate. Similar links have also been found if the subsidiary has the task to focus on certain aspects of the value chain such as marketing (Venaik *et al.*, 2005). Conceptually, Rugman and Verbeke (2001) argue that autonomy allows the subsidiary to develop subsidiary specific advantages that can under certain circumstances be exploited throughout the multinational network. This observation has also been linked with entrepreneurial activities that are more likely to occur in subsidiaries with decision-making autonomy (Birkinshaw *et al.*, 2005). This might be of particular relevance for subsidiaries located in emerging markets. For instance, some home grown firm specific advantages that have been transferred to the subsidiary might require local adaptations to be useful in the subsidiary (Dahms, 2017). This allows the subsidiary to develop competencies in its own right in not only adapting certain transferred practises,

but to possibly extent those and make those work in other emerging market settings as well. In sum, the elevated status, such as a research and development centre that can be associated with greater decision-making autonomy, is likely to positively effect on the development of support value adding competencies. Furthermore, autonomy on the primary value adding activities side, such as sales, can further nurture the accumulation of competencies in that area. We therefore expect that autonomy is positively associated with primary and support competence development:

H5. There is a positive association between autonomy and relative (primary and support) competence development in subsidiaries.

2.3.1 Autonomy and networks. Birkinshaw *et al.* (2005) argue that decision-making autonomy also influences the network relationships of the subsidiary. Such association has been confirmed on both networks i.e. inter-organisational as well as intra-organisational network relationships strength (e.g. Gammelgaard *et al.*, 2012; Chiao and Ying, 2013).

Previous studies found that decision-making autonomy is negatively associated with intra-organisational network relationships (Phelps and Fuller, 2000). This is because an increase in autonomy can lead to an isolation of the subsidiary compared to other units in the multinational network (Monteiro *et al.*, 2008). This could be even more so for subsidiaries located in emerging markets (Edwards *et al.*, 2002). For instance, Bouquet and Birkinshaw (2008) show that subsidiaries that are located at the periphery of the multinational network might become more isolated over time with increases in decision-making autonomy. Therefore, subsidiaries located in a small emerging economy such as Taiwan are less likely to occupy a central network position (Chiao and Ying, 2013). Hence, our next hypothesis is as follows:

H6. There is a negative association between autonomy and intra-organisational network strength.

Greater decision-making autonomy means that managing directors have more freedom in their resource usage and can engage in relationship building with actors outside the multinational network (Chiao and Ying, 2013). In our context, managing directors can nourish relationships with non-business and business networks (Birkinshaw *et al.*, 2005). For instance, autonomy provides managers with the necessary freedom to negotiate with local suppliers and buyers and thereby establish stronger local network relationships. This is likely to lead to experience curve effects that further reduce the cost of transaction with local business and non-business entities. Eventually, more autonomy might lead to a much stronger integration of the subsidiary in the local network than the multinational network (Andersson *et al.*, 2002; Bouquet and Birkinshaw, 2008). Hence, our last set of hypothesis (Figure 1):

H7a. There is a positive association between autonomy and non-business network strength.

H7b. There is a positive association between autonomy and local business network strength.

3. Data collection method, sample characteristics, and operationalisation

3.1 Data collection method and Sample characteristics

The unit of analysis for this research is the subsidiary. In line with prominent studies in the field such as Venaik *et al.* (2005) and Gammelgaard *et al.* (2012), a Dun & Bradstreet database has been used to establish the sample universe. Survey method has been adapted in order to collect data on the inner workings of as many FOS in Taiwan as possible. In particular, the data collection method has been adopted from the well-established world enterprise surveys carried out by the World Bank (World Bank, 2011). This is because in

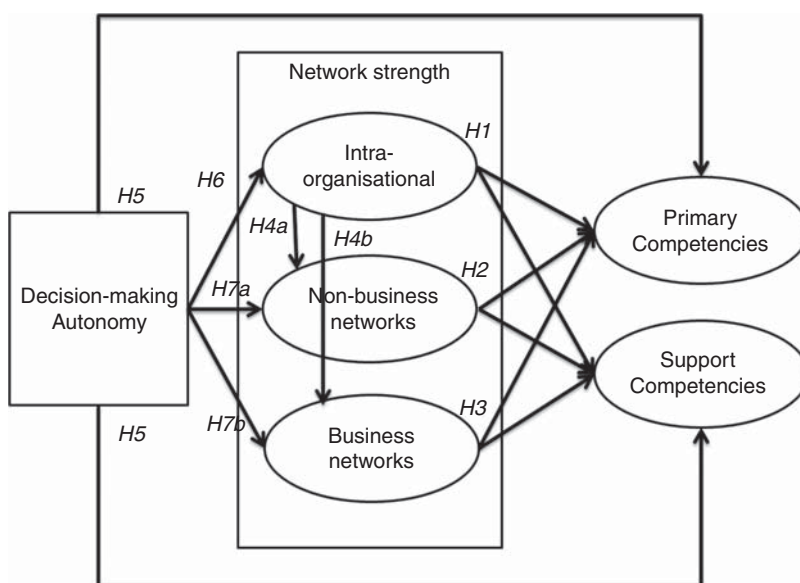


Figure 1.
Research model

emerging markets, survey based research is still relatively uncommon and sometimes even looked at with suspicion by respondents, which can lead to comparatively low response rates (Burgess and Steenkamp, 2006). Therefore, a call centre has been initiated at the university and the call centre agents have received nine hours training prior to conducting the survey. The agents then called the managers at the subsidiaries and explained the survey goals and objectives. Our efforts to develop trust between the research team and the managers resulted in a favourable response rate of 29.1 per cent (226 out of 776). *t*-Tests have been conducted along the dimensions of industry and establishment size in order to ensure non-response bias is not an issue for the data set.

The survey instrument has been designed along the lines of best practise in international business surveys in order to increase comparability of our findings (Chidlow *et al.*, 2015). The majority of constructs has therefore been adapted from previous studies. Before sending out the survey, the questionnaire has also been pilot tested in personal assessment sessions with managing directors from different industries and countries. The questionnaire has been forward and back ward translated with the help of Chinese speaking academics and practitioners in Taiwan as well as the UK.

The sample characteristics in Table I indicate that the FOS in Taiwan are relatively mature with a majority being over ten years in foreign ownership. Over half of the responding subsidiaries have more than fifty employees which is likely caused by the prevalence of foreign direct investment into labour intensive sectors. The most common mode of market entry is Greenfield and most of the firms are part of the service sector. The latter also reflects the current changes in mid-range emerging economies from predominantly manufacturing to more service sector industrial focus (Hoskisson *et al.*, 2013).

3.2 Operationalisation of the variables

The empirical analysis is based on six key constructs and four controls. The dependent variables have been adapted from Birkinshaw *et al.* (1998) and Verbeke *et al.* (2016). Rugman and Verbeke (2001) and Verbeke *et al.* (2016) suggest that because multinationals

Table I.
Sample characteristics

Size (number of employees)			Years in foreign ownership		
Employees	Freq.	%	Years in FO	Freq.	%
< 20	70	31	< 10years	66	29
21–50	41	18	11–20years	76	34
51–150	65	29	21–30years	56	25
> 151	50	22	> 30	28	12
Total	226	100	Total	226	100
Entry mode			Industry		
	Freq.	%		Freq.	%
Greenfield	148	65	Manufacturing	88	39
Acquisition	29	13	Service	138	61
Joint venture	49	22	Total	226	100
Total	226	100			

are able to more finely slice their value adding activities, the subsidiaries themselves will be more likely to specialise in certain parts of the value chain. Therefore, we followed the classical distinction of activities carried out in subsidiaries along the value chain. In particular, we distinguish between primary activity competencies (sales/marketing; production of goods or services; logistics/distribution) and supporting activities competencies (research and development; human resource management; other administrative functions (e.g. legal, financial, etc.); purchasing). Participants were asked: Please indicate the capability or distinctive expertise of your site in the following areas relative to other units in the corporation e.g. headquarters and/or other subsidiaries (1 = far below average, 7 = far above average).

The inter- and intra-organisational network relationship strength has been measured following the studies of Gammelgaard *et al.* (2012) and Dahms (2015). Participants were asked to indicate the strength of relationships they have with each of the following actors (1 = very weak, 7 = very strong). Intra-organisational actors: buyers within the corporation; suppliers within the corporation; R&D and innovation centres within the corporation; headquarters; other units within the corporation. Monaghan *et al.* (2014) and Dahms (2015) suggest that subsidiaries do distinguish between various inter-organisational network actors in their relationship efforts and rationale. Hence, we distinguished between non-business actors (governmental institutions in Taiwan; science centres, universities in Taiwan) and key local business actors (suppliers and buyers).

We assessed decision-making autonomy by following Edwards *et al.* (2002) and Gammelgaard *et al.* (2012): Please indicate where the strategic (i.e., policy) decisions are made for the following areas (1 = exclusively by headquarters, 7 = exclusively by the subsidiary): market area supplied; product range; R&D and new product development; producing goods/services; financial control; human resource management.

This study also controlled for factors that have been identified as playing a role in foreign-owned subsidiary competence development in adjacent conceptual and empirical studies. Geographic distance between the home and host country has been included since it is a persistent indicator for increased cost of transaction in distant host countries. The measures have been used from the Dow and Karunaratna (2006) database. We included the age of the establishment as number of years since the subsidiary is being in foreign ownership in order to control for experience curve effects (Hennart, 2009). Relative size has been included to control for the potential subsidiary influence within the MNE network (Bouquet and Birkinshaw, 2008). We follow Raziq *et al.* (2013) and divide the number of employees at the site by the number of employees in the multinational. We also control for industry since service and manufacturing sector affiliation can affect subsidiary development (Gammelgaard *et al.*, 2012). Last, we also control for the entry mode since

this too might affect the outcome variables (Hennart, 2009). The variable has been dummy coded in “0” for Greenfield investments and “1” for joint ventures and acquisitions.

3.2.1 Common method bias. This study also considers the impact of potential common method bias in its research design. In line with best practise in the field (Chang *et al.*, 2010), a number of steps have been taken to minimise and to control for its impact. First, the constructs have been randomly placed on the questionnaire. Second, we employ a complex structural equation modelling technique which makes it unlikely that the respondents predict the model of our research while answering the questionnaire. Third, we also include control variables from other sources than the questionnaire such as geographic distance, industry or parent firm size. Last, we also employed a number of post-hoc tests. For instance, in line with Gammelgaard *et al.* (2012), we also conducted a Harman’s one factor test, which resulted in a total variance explained of well below the threshold of 50 per cent for the largest factor (Podsakoff and Organ, 1986). Furthermore, the variance inflation factors (VIFs) are all below commonly applied threshold of 5 (Hair *et al.*, 2012). Hence, common method bias is not deemed a threat to our results.

4. Analysis and results

In order to test our hypothesised model we employ a structural-equation modelling – partial least squared techniques (SEM-PLS). This is an appropriate analysis technique because the theoretical background used in this research is still relatively recent and hence a more exploratory data analysis technique seems appropriate (Venaik *et al.*, 2005; Richter *et al.*, 2015, 2016; Henseler *et al.*, 2016). SEM-PLS also have fewer data structure requirements than more commonly applied ordinary least squared regression or covariance-based methods such as LISREL for instance (Hair *et al.*, 2012). Last, it allows for the investigation of complex relationships between multiple latent and manifest variables, which are required for our research model.

PLS models consist of two parts. The first is the measurement model, which provides insights into the relationships between latent variables. The second is the structural model which shows the regressions between the latent and the manifest variables. We used WarpPLS 5.0 software to analyse the data.

4.1 Measurement model

The measurement model assesses the reliability and validity of the measurement constructs. The convergent validity ensures that the statements of the questions are sufficiently correlated with the expected latent variables. The discriminant validity tests if the latent variables measure sufficiently distinct constructs.

The factor loadings of each set of latent variable, as shown in Table II, range from 0.590 to 0.909. The Composite reliabilities and Cronbach’s α values are well above the 0.7 threshold. Hence, our model shows acceptable convergent validity (Nunnally, 1978; Fornell and Larcker, 1981).

In order to assess the discriminant validity, the square root of the average variance extracted should be higher than the bivariate correlations between the latent variables (Fornell and Larcker, 1981). The values in Table III all indicate acceptable discriminant validity. Furthermore, the VIFs are well below the threshold of 5 (Hair *et al.*, 2012) and the bivariate correlations are below the 0.8 threshold (Neter *et al.*, 1985), both of which indicates that multicollinearity is not a major issue for this study.

4.2 Structural model

The results of our structural model analysis are summarised in Table IV. The table provides the path coefficients and the corresponding p -values. We also calculated the R^2 values for

Table II.
The measurement
model

	Mean	SD	Convergent validity ^a	Composite reliability	Cronb. α	AVE
<i>Primary activities</i>						
Sales/marketing	5.29	1.34	0.778	0.752	0.706	0.506
Production of goods or services	5.46	1.34	0.752			
Logistics/Distribution	5.12	1.55	0.590			
<i>Support activities</i>						
Purchasing	4.82	1.48	0.729	0.833	0.730	0.557
Research and development	4.36	1.90	0.618			
Human resource management	5.15	1.30	0.781			
Other administrative functions	4.81	1.37	0.841			
<i>Decision-making autonomy</i>						
Market area supplied	3.82	2.18	0.876	0.927	0.905	0.681
Product range	3.58	2.21	0.854			
R&D and new Prod. Dev.	3.31	2.10	0.836			
Producing goods/service	3.92	2.10	0.857			
Financial control	3.76	1.98	0.768			
Human resource	4.44	2.09	0.752			
<i>Intra-organisational</i>						
Buyers	5.31	1.46	0.821	0.868	0.809	0.569
Suppliers	5.42	1.41	0.814			
R&D centres	5.19	1.72	0.700			
Headquarters	6.03	1.14	0.676			
Other units	5.63	1.25	0.749			
<i>Non-business</i>						
Governmental institutions	4.66	1.74	0.909	0.905	0.791	0.827
Science centres, universities	4.23	1.74	0.909			
<i>Business</i>						
Suppliers	6.10	1.12	0.898	0.893	0.761	0.807
Customers	5.92	1.21	0.898			
Note: ^a Cross-loadings are oblique-rotated						

Table III.
Discriminant validity

		1	2	3	4	5	6
1	1. Primary	<i>−0.711</i>					
2	2. Support	0.651	<i>−0.746</i>				
3	3. Autonomy	0.25	0.364	<i>−0.825</i>			
4	4. Intra-org.	0.336	0.376	0.126	<i>−0.754</i>		
5	5. Non-busin.	0.282	0.342	0.279	0.392	<i>−0.909</i>	
6	6. Business	0.381	0.171	0.092	0.423	0.248	<i>−0.898</i>
Note: Diagonals in italic are the square roots of the average variance extracted and off-diagonal are the bivariate correlations between the constructs							

the dependent latent variables. Those were: 0.306 for primary activity competencies, 0.276 for support activity competencies, 0.033 for intra-organisational network strength, 0.254 for non-business network strength and 0.226 for business network strength.

Overall, we found good support for our hypothesis. As expected, intra-organisational network strength is positively associated with primary and secondary activity competencies, hence supporting *H1*. Although slightly weaker, we also confirmed that non-business network strength positively relates to primary and secondary activity

Table IV.
PLS tests

Hypothesis/association	Directionality	Path coefficient	p-value	Hypothesis supported
<i>H1: intra-organisational and competencies</i>				
Primary activity competencies	(+)	0.232	< 0.001	Yes
Support activity competencies	(+)	0.310	< 0.001	
<i>H2: non-business network strength and competencies</i>				
Primary activity competencies	(+)	0.113	0.043	Yes
Support activity competencies	(+)	0.139	0.017	
<i>H3: business network strength and competencies</i>				
Primary activity competencies	(+)	0.290	< 0.001	Partially
Support activity competencies	(+)	-0.055	0.202	
<i>H4a: intra-organisational network strength and non-business network strength</i>	(+)	0.413	< 0.001	Yes
<i>H4b: intra-organisational network strength and local business network strength</i>	(+)	0.452	< 0.001	Yes
<i>H5: autonomy and competencies</i>				
Primary activity competencies	(+)	0.187	0.002	Yes
Support activity competencies	(+)	0.287	< 0.001	
<i>H6: autonomy and intra-organisational networks</i>	(-)	0.181	0.003	No
<i>H7a: autonomy and non-business networks</i>	(+)	0.253	< 0.001	Yes
<i>H7b: autonomy and local business networks</i>	(+)	0.092	0.08	Yes

competencies, hence supporting *H2* as well. *H5* was confirmed in that autonomy was positively associated with both competence dimensions. We also show that intra-organisational networks positively influence the development of non-business sector as well as business network strength; hence *H4a* and *H4b* are supported. A positive association was also present between autonomy and non-business and business networks strength, which supports *H7a* and *H7b*.

However, local business networks are only positively associated with primary activity competencies but not with support competencies, hence, *H3* receives only partial support. Furthermore, autonomy showed a positive association with intra-organisational network strengths, which was contrary to our expectations. So, *H6* was not supported.

We also included the control variables in our model. However, their inclusion does not markedly alter the relationships between the key constructs. For instance, the control model also confirms the positive association between autonomy and intra-organisational network strength. In the control model we confirm that business network positively influence the support activity competencies, but the effect remains statistically non-significant ($\beta = 0.071$; $p = 0.141$). The results for the control variable model, as well as the standard errors for path coefficients and standard errors for path coefficients are presented in full in Appendix.

The software also provides model fit indexes that are worthwhile reporting here. First, the average path coefficient (APC) were 0.231 and the average R^2 (ARS) were 0.219 both significant at $p < 0.001$. The average VIF was 1.133 and hence well below 5. All suggest a good model fit and are presented in full in Appendix.

4.3 Supplementary fsQCA analysis

In spite of the advantages of using SEM-PLS, it still suffers from some of the same shortcomings as other symmetric analysis methods. Hence, it has been argued that fsQCA is a suitable supplement to traditional symmetric analysis methods (Schneider and Wagemann, 2010; Woodside, 2013). For instance, fsQCA allows for non-symmetric

relationships between variables (Ragin, 2008) and for multiple combinations of conditions that can lead to the same outcome (equifinality) (Cuervo-Cazurra *et al.*, 2016; Fiss, 2007). fsQCA is based on Boolean algebra and is hence using a set theoretic approach. Accordingly, in order to establish set membership, the variables need to be calibrated. In other words, a variable needs to be transformed into a condition. Each condition represents a value that indicates if a condition is present in a certain outcome or not (Ragin, 2008; Schneider and Wagemann, 2010).

Hence, the first step we need to take is to calibrate our data into fuzzy sets. That means we distinguish cases that are either fully in, fully out, or in between of certain sets. Our data shows conditions that can also take intermediate values. Therefore, we divide our values in 25 percentiles in which the 25th is fully out = 0, the 50th percentile is the 0.5 cut-off point, and the 75th percentile is 1 = full membership. The individual cut-off values are presented in Table V.

Core condition analysis is presented in Table VI. None of the conditions reaches a consistency value of > 0.9, which indicates that none of the conditions is necessary (Ragin, 2008). That implies that there is no single condition that by itself is required for primary or support competence development in FOS.

Table VII provides the intermediate solutions from our fsQCA analysis. Solution coverage and consistency values are well within the range of usual thresholds (Ragin, 2008). As expected, we identify a pattern of equifinality in our solutions. That means, there are a number of configurations that can lead to greater competencies in FOS. The most interesting solutions are the ones with the highest raw coverage. Coverage in fsQCA can be seen as the equivalent to the *R* value in traditional regression models. A solid circle (●) indicates the condition is present and ⊗ indicates its absence, a blank space indicates that the condition has no influence on the outcome (i.e. do not care).

Table V.
Calibration values and
conditions

Condition	Mean	SD	Minimum	Maximum	Percentiles		
					25	50	75
Primary	5.29	1.00	2.33	7	4.67	5.33	6.00
Support	4.78	1.12	1	7	4.00	5.00	5.50
Autonomy	3.81	1.74	1	7	2.50	3.83	5.17
Intra-org.	5.52	1.05	1	7	5.00	5.60	6.40
Non-business	4.45	1.58	1	7	3.88	4.50	5.50
Business	6.01	1.05	2	7	5.50	6.00	7.00

Table VI.
Analysis of necessary
conditions

Conditions tested	Outcome variable			
	Primary		Support	
	Consistency	Coverage	Consistency	Coverage
Autonomy	0.576	0.605	0.656	0.656
~ Autonomy	0.493	0.501	0.445	0.430
Intra-org.	0.623	0.663	0.659	0.667
~ Intra-org.	0.470	0.471	0.439	0.419
Non-business	0.620	0.649	0.649	0.646
~ Non-business	0.447	0.456	0.428	0.415
Business	0.683	0.664	0.644	0.596
~ Business	0.389	0.428	0.453	0.474

Note: The highest values are shown in italic, but none was > 0.9. “~” stands for not

Table VII.
fsQCA results

Outcome Condition solution	High primary competencies			Low primary competencies		High support competencies		Low support competencies	
	1	2	3	4	5	6	7	8	9
Autonomy	●	●	⊗	⊗		●	●	⊗	
Intra-org.		●	●	⊗	⊗	●	●	⊗	⊗
Non-business	●	●	⊗		⊗		●		⊗
Business	●		●	⊗	⊗	●			⊗
Raw coverage	0.323	0.298	0.130	0.320	0.388	0.348	0.338	0.451	0.380
Unique coverage	0.069	0.045	0.100	0.041	0.108	0.064	0.054	0.172	0.101
Consistency	0.772	0.770	0.777	0.788	0.767	0.816	0.830	0.800	0.792
Overall solution coverage		0.467			0.428		0.402		0.552
Overall solution consistency		0.766			0.757		0.822		0.771

We have three solution configurations for high primary competencies. Solution one suggests that the presence of autonomy, and links with local non-business and business networks are conducive to the development of primary competencies in foreign subsidiaries. The second path suggests high intra-organisational networks, local non-business networks and autonomy. The third suggests a substitution effect. Autonomy and non-business network links can be substituted with high intra-organisational and local business network links. However, raw coverage is relatively low. We also test the negated outcomes. Schneider and Wagemann (2010) argue that negative outcomes cannot be assumed to be simply caused by the absence of a certain condition. This seems to be confirmed in our results in solutions 4 and 5. From solution 5 for instance we can infer that the absence of intra-organisational networks, local non-business and business networks lead to low primary competencies. This suggests that the conditions leading to high or low primary competencies are indeed different.

High support competencies are caused by autonomy, intra-organisational networks and local business networks in solution 6. Solution 7 indicates as alternative path that high autonomy, intra-organisational networks and local non-business networks cause high support competencies. The negated results show the absence of autonomy and intra-organisational networks in solution 9 and the absence of intra-organisational networks, local business networks and non-business networks cause low support competence development.

The results reveal some interesting patterns. For instance, decision-making autonomy plays a key role in the development of competencies. Keeping in mind that it is not a core condition, it nevertheless plays an important role in primary and support competence development. We also show that intra-organisational relationships have a prominent position in all fsQCA models. Non-business and business network links appear to play also a role, although in fewer cases and are not a substitute for total MNE effects. However, we complement our SEM-PLS findings in showing that local business as well as local governmental actors can contribute to competence development in a number of cases.

5. Discussion and conclusions

This research was grounded in the competence based view of the firm, network and the autonomy perspectives in foreign-owned subsidiary development literature. This study contributes to existing conceptual and empirical literature in three main ways. First, following Rugman and Verbeke (2001) and Verbeke *et al.* (2016) arguments that MNE's finely slice their value adding activities, we are among the first to actually test competence development in a fine grained manner. In particular, we distinguish between primary and support activity competencies in subsidiaries. Second, we not only conceptually distinguish between and empirically test intra- and inter-organisational network strength,

but we also include business and non-business networks in order to highlight the complex sources from which subsidiaries can gain competencies (Phelps and Fuller, 2000; Monaghan *et al.*, 2014; Achcaoucaou *et al.*, 2014). Third, we test our framework in the mid-range emerging economy of Taiwan and therefore extend previous studies that predominantly focussed on subsidiaries located in developed countries (e.g. Gammelgaard *et al.*, 2012; Achcaoucaou *et al.*, 2014).

The results support most of our initial expectations. Most prominently, we show that intra-organisational network strengths had the strongest impact on overall competence development in the subsidiaries. This is in line with Rugman and Verbeke (2001) and Verbeke *et al.* (2016) who argue that subsidiaries rely to a large extent on multinational enterprise resources in order to facilitate their development. We extend their arguments in showing that intra-organisational relationship strength also positively effects the development of non-business and business network relationships. This could be because in emerging markets the lack of experience could increase external cost of transaction; hence, the subsidiary relies to a larger extent on the knowledge that resides within the multinational network (Liu *et al.*, 2017). This is also confirmed in the relatively weak effect of business network strength on support activity competence development. This puts authors such as Doz *et al.* (2001) into a more realistic context who argue that emerging markets can be important sources of competence development. Our findings suggest that business networks have a positive association only with primary competence development, which indicates that such locations are only able to contribute to competence development in a more narrow sense than often suggested (e.g. Doz *et al.*, 2001; Nguyen, 2014; Hutzschenreuter and Matt, 2017).

We also extend the literature in showing that decision-making autonomy has a positive association with intra-organisational relationship development. Theoretically, we found support for the arguments made by Birkinshaw *et al.* (2005) who emphasise the complex interaction between organisational networks and autonomy on subsidiary development. This is a meaningful extension of previous studies such as Gammelgaard *et al.* (2012). We believe that our finding shows that subsidiaries located in emerging markets have different structural requirements. For instance, localisation pressures might be much higher (Ghoshal and Nohria, 1997) and hence require a potentially counterintuitive constellation of networks and autonomy in order to take advantage of location economies. This might be also evident in the unexpectedly positive association between autonomy and intra-organisational relationship strength. Our study therefore also contributes to the conceptual discussion on the application of old theories in emerging markets (Wright *et al.*, 2005). For instance, it might well be that the greater decision-making autonomy, which represents also valuable managerial decision-making resources, appear to be more fruitfully directed to the MNE network rather than the development of independence from the rest of the multinational and its headquarters. This might be because subsidiaries located in emerging markets might still be considered peripheral and struggle for attention (Bouquet and Birkinshaw, 2008).

Finally, we aimed also to contribute to the theoretical discussion in the field by investigating equifinality in competence development of FOS (Fiss, 2007; Cuervo-Cazurra *et al.*, 2016). To the best of our knowledge, this is the first larger scale empirical study to do so in the context of emerging markets. The supplementary fsQCA analysis revealed the complexity of the issue under investigation. None of the conditions crystallised itself as a core condition. That means that all factors need to be taken into consideration. The analysis, however, also showed that all of the suggested factors were present in at least one configuration set. This seems to indicate that our network and autonomy framework covers a large part of all the factors that are relevant to competence development of FOS in emerging markets. We also confirmed the SEM-PLS results in that the most prevalent

conditions were decision-making autonomy and intra-organisational networks. We extend our SEM-PLS findings by highlighting the existence of solutions that require local business and local non-business networks as condition for high primary as well as support competence development. This is an important implication for emerging economies. For instance, it shows that scarce resources that are often employed to attract foreign direct investment might need to be more narrowly targeted to have the intended effects, such as a deeper economic integration of the subsidiary in the local economy. However, our results show that the potential for such integration is present.

5.1 Policy and managerial implications

Our findings also have policy and managerial implications. For instance, we show that non-business networks might be more important for support competence development than their business counterparts. This is important because it allows policy maker to positively influence subsidiary development and in extension ensure subsidiary long term survival.

For managers, we show that managerial resources need to be used with consideration for competence development in the subsidiary. Indeed, we show that it is not only the kind of network that needs to be considered, but also what kind of competence the subsidiary intends to develop. We also show that decision-making autonomy might not *per se* lead to an isolation of the subsidiary (Bouquet and Birkinshaw, 2008), at least in an emerging market context.

5.2 Limitations and future research

The results of our study have been derived from a cross-sectional survey of FOS located in the mid-range emerging economy of Taiwan. We believe that longitudinal studies could shed further light on the development of subsidiary competencies. We showed that our findings differ from developed country studies; however, it would be also helpful to expand this research in other emerging economies in order to test for the generalisability of our findings. Furthermore, our data have been collected from one respondent from each subsidiary. It could be, however, that the actual integration of the subsidiary is seen differently at the headquarters level. This would require data from both the subsidiary as well as the headquarters, however, this is outside the scope of the current study. Lastly, it might well be that there exist further associations between the variables. For instance, competencies might also affect decision-making autonomy. While we took a stance similar to Gammelgaard *et al.* (2012) who see autonomy more of an antecedent rather than an outcome, we cannot fully rule out that possibility. In line with Cavanagh *et al.* (2017), we believe that future studies can gain much by more thoroughly addressing autonomy in FOS. Lastly, micro-level studies could provide deeper insights (Guo and Lv, 2018).

5.3 Conclusion

This study investigated the effects of different dimensions of network relationship strengths on competence development in FOS located in the mid-range emerging economy of Taiwan. Our findings suggest that intra-organisational networks are still one of the key drivers of competence development in such subsidiaries. We expand other studies in showing that autonomy plays a facilitating rather than a hindrance factor in that process.

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Further reading

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Appendix

	Model without controls	Model with controls	Range
Average path coefficient (APC)	0.231, $p < 0.001$	0.137, $p = 0.009$	
Average R^2 (ARS)	0.219, $p < 0.001$	0.236, $p < 0.001$	
Average adjusted R^2 (AARS)	0.210, $p < 0.001$	0.215, $p < 0.001$	
Average block VIF (AVIF)	1.133	1.102	Acceptable if ≤ 5 , ideally ≤ 3.3
Average full collinearity VIF (AFVIF)	1.574	1.402	Acceptable if ≤ 5 , ideally ≤ 3.3
Tenenhaus GoF (GoF)	0.379	0.433	Small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36
Sympson's paradox ratio (SPR)	0.923	0.973	Acceptable if ≥ 0.7 , ideally = 1
R^2 contribution ratio (RSCR)	0.989	1.000	Acceptable if ≥ 0.9 , ideally = 1
Statistical suppression ratio (SSR)	1.000	0.946	Acceptable if ≥ 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	1.000	0.932	Acceptable if ≥ 0.7

Table AI.
Model fit and
quality indices

	Primary	Support	Autonom	Intra	IntGov	IntBus	Age	GeoDist	RelaSiz	Industr	EntrMod
<i>Path coefficients</i>											
Primary			0.195	0.196	0.123	0.311	0.08	0.008	-0.028	-0.06	-0.066
Support			0.295	0.29	0.122	0.078	0.114	-0.007	0.06	-0.025	-0.079
Autonom							0.076	0.268	0.025	-0.068	0.088
Intra			0.168				0.179	0.088	-0.16	-0.168	0.054
IntGov			0.249	0.371			0.091	0.105	-0.153	-0.023	0.079
IntBus			0.09	0.437			-0.097	0.035	-0.115	0.11	0.12
<i>p-values</i>											
Primary			0.001	0.001	0.03	< 0.001	0.112	0.453	0.336	0.182	0.159
Support			< 0.001	< 0.001	0.031	0.118	0.041	0.459	0.181	0.352	0.114
Autonom							0.123	< 0.001	0.355	0.152	0.09
Intra			0.005				0.003	0.091	0.007	0.005	0.209
IntGov			< 0.001	< 0.001			0.082	0.055	0.01	0.366	0.114
IntBus			0.085	< 0.001			0.07	0.297	0.04	0.047	0.034
Reflective (F)	R	R	R	R	R	R	F	F	F	F	F

Table AII.
Results with controls

Table AIII.
Path analysis

	Primary	Support	Autonom	Intra	IntGov	IntBus
<i>Standard errors for path coefficients</i>						
Primary			0.064	0.064	0.065	0.063
Support			0.063	0.063	0.065	0.066
Autonom						
Intra			0.064			
IntGov			0.064	0.062		
IntBus			0.065	0.061		
<i>Effect sizes for path coefficients</i>						
Primary			0.052	0.095	0.036	0.123
Support			0.107	0.132	0.049	0.012
Autonom						
Intra			0.033			
IntGov			0.073	0.18		
IntBus			0.015	0.211		

About the author

Sven Dahms is Lecturer at James Cook University Singapore. He earned his PhD Degree from the Manchester Metropolitan University, UK. His current research focusses on the development of foreign-owned subsidiaries, international strategies of multinational family business groups and intellectual capital development in emerging markets. Sven Dahms can be contacted at: svendahms@hotmail.com