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# Isomorphic Mechanisms in Manufacturing Supply Chains: A Comparison of Indigenous Chinese Firms and Foreign-owned MNCs

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## Abstract

**Purpose** – This study demonstrates empirically the varied mechanisms through which supply chain practices of indigenous Chinese companies are influenced by foreign-owned multinational companies (MNCs) operating within China. It also provides empirical evidence of how the foreign-owned MNCs are influenced by the coercive pressures arising from the local cultural norms and begins an exploration of the mechanisms through which isomorphic pressures operate between industries.

**Design/methodology/approach** – The study adopts a multi-disciplinary approach by applying institutional theory from the field of organisational studies. The study is based on 27 in-depth interviews in matched pairs of firms consisting of an indigenous Chinese firm and a foreign-owned MNC in three industries. The interviews also include suppliers and third-party logistics providers and hence the study extends beyond the dyad.

**Findings** – The findings show a ‘*startling homogeneity*’ between the SCM practices of the paired firms and across the three industries studied. They also provide empirical evidence of the rich and varied mechanisms through which isomorphic pressures operate, and demonstrate that the pressures affect the foreign-owned MNCs as well as the Chinese firms.

**Practical implications** – The study identifies a wide range of mechanisms that firms can use to model their SCM practices on those of other firms. The study also identifies a range of implications for policy.

**Originality/value** – To our knowledge, this study is the first to explore empirically the rich and varied mechanisms through which isomorphic pressures operate.

**Key words:** supply chain practices, institutional theory, isomorphism, China

## Introduction

All happy families resemble one another.

– Leo Tolstoy, *Anna Karenina*

The rapid economic growth of China is well documented (Holz, 2008; *The Times*, 2009; Chuang and Thomas, 2010). A recent report by the World Bank identifies China as the world’s second-largest economy, representing about 9.5% of global GDP. China’s economy is expected to sustain robust growth and is predicted to become the largest economy in the world before the end of the 2030s (World Bank, 2011).

Manufacturing continues to play an important role in China’s economic growth (Liu and Brookfield, 2006). This study considers the development of supply chain practices in the manufacturing sector in China. It addresses the specific question of how the supply chain

practices of indigenous Chinese companies have been influenced by the practices of foreign-owned MNCs within the same industry. The MNCs included in the study are international firms from outside China which have established manufacturing operations in China. The study also recognises that influence may be bi-directional, and considers how the supply chain practices of foreign-owned MNCs are influenced by the indigenous Chinese companies and the Chinese context. It also provides an initial consideration of the mechanisms through which isomorphic pressures operate between different industries. The research is focused by means of the following two questions:

1. Have indigenous Chinese firms adopted SCM practices similar to those of foreign-owned MNCs in the same industry?
2. If so, what mechanisms can explain the adoption of similar practices?

Institutional theory, from the field of organisational studies, provides a well-accepted theoretical lens with which to explore the influences on and between firms (Meyer and Rowan, 1977; Scott, 1987, 2001; Grewal and Dharwadkar, 2002). We therefore adopt institutional theory as a basis for this study.

The paper commences with a review of institutional theory, including its application in the SCM domain. The framework developed to guide the research is then presented and discussed. The methodology adopted for the study is then described and the findings of the study are presented. The conclusions of the study follow, together with a wider discussion of their significance and meaning. The paper concludes with recognition of the limitations of this work and suggestions for future research.

## Literature Review

### Institutional Theory and Isomorphism

Institutional theory recognises that organisations operate within a social arena and therefore considers the social, rather than purely economic, influences on organisational structure and practice (Rogers *et al.*, 2007). It recognises that organisations are influenced by the existence and operation of institutions in their industry or country, where institutions include the legal system, governance mechanisms, capital markets, other organisations and cultural and professional norms. This influence is acutely felt when an organisation is seeking to gain legitimacy (Hitt *et al.*, 2004). One strand of institutional theory is the suggestion that the institutions in a given context will cause organisations to adopt similar structures and practices and, hence, over time, the organisations will tend to become similar or isomorphic (Meyer and Rowan, 1977; Scott, 1987, 2001; Zucker, 1987; Hoffman, 1999). Weber (1952) ascribed this isomorphic tendency to rationalism, bureaucracy and competition within capitalist markets, which forced similar structures and responses on managers and their firms. In contrast, DiMaggio and Powell (1983) argued that it is '*highly structured organisational fields*' (p. 147) and the professionalisation of such fields, both of which increasingly apply to the field of SCM, which are driving this isomorphism.

Initially, managers within a field may adopt a new practice because it appears to offer improved performance or because they have been influenced by the rhetoric and persuasive power of the suppliers of new practices, such as management gurus, management consultants or academics (Watson, 1994; Ketokivi and Schroeder, 2004; Symon, 2008). However, institutional theory suggests that, as adoption of the practice spreads, later adopters are more

likely to adopt the practice because it confers legitimacy and not necessarily because it improves performance (Meyer and Rowan, 1977; Suchman, 1995). Abrahamson and Rosenkopf (1993) drew on institutional theory to support their use of the term '*bandwagon pressure*', and similarly observed that the sheer number of organisations adopting an innovation can result in a pressure that causes other organisations to adopt, without evaluating the efficiency or return of the innovation.

DiMaggio and Powell (1983) identified three mechanisms through which isomorphic change occurs: coercive, mimetic and normative. Although their work was carried out almost three decades ago, the three categories have endured and have been adopted as the theoretical basis for the majority of studies that consider isomorphism in the supply chain management domain. For example, Ketokivi and Schroeder (2004) describe how they '*embrace the three mechanisms*' (p. 66) in their study of the comparison of purely strategic and structural explanations of the adoption of innovative manufacturing practices, with institutional explanations. Lai *et al.* (2006) use the three isomorphic pressures (coercion, mimesis and norms) in order to explore the adoption of radio frequency identification (RFID) in the supply chain and set out the challenges and opportunities that each of the three pressures may give rise to. Liu *et al.* (2010) combine the three mechanisms with measures of organisational culture in order to explore the adoption of internet-enabled supply chain management systems. McFarland *et al.* (2008) use the terms reflexive, compliant and normative in their study of supply chain contagion; however, the descriptions of these terms are highly consistent with the terms coined by DiMaggio and Powell.

Coercive pressures are associated with informal or formal pressures. Informal pressures may arise '*from cultural expectations in the society within which the organisations function*' (DiMaggio and Powell, 1983, p. 150). In China, for example, the Confucian-based social system gives rise to '*guanxi*' (a system of personal connections), which has been known to influence business practices (Su *et al.*, 2008). Coercive pressures may also arise from the need to meet formal government regulations, such as pollution controls, tax and accounting regulations.

Mimetic isomorphism arises from uncertainty. Based on earlier studies, DiMaggio and Powell (1983) argue that when conditions are uncertain, owing, for example, to rapid technological or market change, firms will manage this uncertainty by imitating what other, seemingly successful or legitimate firms are doing. They refer to this behaviour as '*modelling*' (a firm models itself on other firms), and they note that it can operate through a range of mechanisms, including recruiting employees from the other firms, using consultants and participating in industry associations. They also assert that firms with highly skilled workforces will be exposed to the ideas gained during the education and training of their staff. Similarly, they assert that firms with a broad base of customers or highly demanding customers will be exposed to a wide range, or a greater number, of demands and will imitate the responses of other firms to deal with these. Haunschild and Miner (1997) identified three types of imitation: frequency-based (in which actions that have been undertaken by a large number of other organisations are copied); trait-based (in which mimicking is based on selected traits, such as size or industry); and outcome-based (in which actions that appear to be linked to success are imitated). Huang *et al.* (2010) link the findings of their study on the adoption of e-commerce in the supply chain to the typology developed by Haunschild and Miner (1997). They observe that many studies based on institutional theory focus on frequency- and trait-based influences. However, they show that, through benchmarking,

outcome-based influences can also be important, particularly in the early adoption stage of practices when there will not be a large population of adopters in place.

Normative isomorphism arises from professionalisation. Following Larson (1977) and Collins (1979), DiMaggio and Powell (1983) described professionalisation as ‘*the collective struggle of members of an occupation to define the conditions and methods of their work ... and to establish a cognitive base and legitimisation for their occupational autonomy*’ (p. 152). Two particular mechanisms of normative isomorphism are identified: professional networks and formal education. Over the past two decades, the field of SCM has witnessed considerable growth in the level of both professionalisation and formal qualifications. For example, in 2006 Tsinghua University and Harvard Business School (HBS) formed an alliance to create and deliver an executive education programme in China called the Allied Supply Chain Management Solution (ASCMS).

An alternative model in the field of institutional theory is Scott’s three institutional pillars model (Scott, 1995; 2001). This identifies three types of institutional influence: regulative, normative and cognitive. However, the purposes of this model are distinct from those of DiMaggio and Powell, in that Scott developed his model to categorise and highlight the differences in the influences on institutions; that is, it seeks to separate the social and rational influences on organisations. In contrast, DiMaggio and Powell’s mechanisms seek to highlight that social influences are an integral part of the pressures acting on organisations that cannot easily be separated from other influences. Whilst the three pillars model is well recognised in the field, the model has been criticised for its reductionist approach (Hirsch, 1997). It may be for this reason that the three pillars model has been the basis of few recent studies in the supply chain domain (e.g. Deligonul *et al.*, 2011).

The three pressures identified by DiMaggio and Powell and the mechanisms through which they operate are summarised in Table 1. It can be seen that the three types of pressure operate through a rich and varied set of mechanisms and that there is some overlap between the mechanisms. For example, industry and trade associations are seen to enable both mimetic and normative isomorphism.

**Table 1: Isomorphic Pressures and Mechanisms (after DiMaggio and Powell, 1983)**

<b>Isomorphic Pressure</b>	<b>Mechanisms</b>
<p><b>Coercive</b></p> <p><i>Formal and informal pressures such as government regulations or local culture</i></p>	<ul style="list-style-type: none"> <li>• Local culture</li> <li>• Government requirements</li> <li>• Requirements of funders</li> <li>• Influence of parent organisation on subsidiaries</li> <li>• Need to mirror other organisations in order to interact easily</li> </ul>
<p><b>Mimetic</b></p> <p><i>Arising from uncertainty – firms will imitate other firms that appear successful or legitimate</i></p>	<ul style="list-style-type: none"> <li>• Employee transfer</li> <li>• Consulting firms</li> <li>• Industry associations</li> <li>• Wide or demanding customer base</li> </ul>
<p><b>Normative</b></p> <p><i>Arising from</i></p>	<ul style="list-style-type: none"> <li>• Formal educational programmes</li> <li>• Training</li> </ul>

<i>professionalisation, particularly of functional fields</i>	<ul style="list-style-type: none"> <li>• Professional networks and trade associations</li> <li>• Recruitment practices, e.g. from the same universities or the same firms</li> <li>• Legitimacy of key firms in industry</li> <li>• Common career titles and paths</li> </ul>
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### **Institutional Theory in SCM Research**

Rogers *et al.* (2007) state that operations management and supply chain researchers are in a unique position to contribute both theoretically and empirically to a better understanding of institutional theory, owing to their '*subject matter being grounded in substantive operational activities*' (p. 570). A number of researchers in the supply chain field have undertaken studies that have applied an institutional theory perspective to supply chain management.

As noted above, Ketokivi and Schroeder (2004) compared the explanatory power of strategic and structural contingency theories with the explanatory power of institutional theory. Like the present study, their study considered the adoption of a range of practices, including JIT and supply chain relationships. They found that the institutional perspective explained a greater proportion of the variance in practice adoption than either the strategic or structural contingency theories, thus supporting their call to broaden the study of organisations beyond the rational and economic perspectives that are most frequently adopted.

McFarland *et al.* (2008) employed institutional theory as the theoretical basis of their study of supply chain contagion, which they defined as '*the propagation of inter-firm behaviours from one dyadic relationship to an adjacent dyadic relationship in the supply chain*' (p. 63). Zsidisin *et al.* (2005) employed institutional theory to explore the adoption of business continuity planning, whilst Zhu and Sarkis (2007) utilised institutional theory to explore the adoption of green supply chain practices. As mentioned above, Lai *et al.* (2006) explored the adoption of RFID in the supply chain. They also set out the challenges and opportunities that each of the three isomorphic pressures may give rise to, and how managers might address these opportunities and challenges.

Su *et al.* (2008) used an institutional perspective to explore the level and maturity of adoption of a range of SCM practices by Chinese firms, employing a quantitative, survey-based method. Whilst they identified differential levels of adoption, they did not explore the mechanisms that influenced and enabled adoption. Liu *et al.* (2010) also undertook a quantitative survey of firms in China, focusing on the adoption of the single practice, eSCM. Whilst these authors investigated coercive, mimetic and normative pressures, their investigation was limited to a limited number of simple questionnaire items and did not include an exploration of the rich and varied mechanisms suggested by DiMaggio and Powell (1983) and set out in Table 1.

Consistent with the focus on operational mechanisms in the current study, Rogers *et al.* (2007) sought to address a gap in institutional-theory-based studies by considering the implications of institutional pressures at an operational level within the organisations studied. The researchers started from the premise that the supplier development programme operated by a major North American automotive manufacturer was coercive in nature and sought to explore how the suppliers involved in the programme responded to the coercive pressures. They found '*biased positive reporting*' (p. 568) in which suppliers sought to manipulate information so that it justified participation in the programme, even when there was not

rational support for participation. Deligonul *et al.* (2011) considered supplier networks in the specific case of the furniture retailer Ikea. As noted earlier, theirs is one of the few studies in the field that uses Scott's three institutional pillars model as a basis for a study. Whilst isomorphic mechanisms are not the focus of their study, their findings suggest that there are varied and rich mechanisms, many of them social in nature, through which the furniture retailer seeks to influence the strategies and activities of its suppliers.

To our knowledge, this study represents the first in which the varied mechanisms identified in Table 1 have been set out explicitly and explored empirically. Considering a range of SCM practices means that the findings of the study are more generalisable and have wider applicability and interest than institutional-theory-based studies that focus on a single SCM practice.

## Research Framework

In order to compare the SCM practices adopted by indigenous Chinese firms and foreign-owned MNCs, a research framework was developed. The framework consists of supply chain practices that are recognised in extant literature as good practice. We recognise that the context will influence what is considered good practice; however, a detailed review of existing literature allowed us to identify nine SCM practices (see Table 2) that appeared well regarded, effective and applicable in a range of contexts. We realise that this list of nine practices is not exhaustive, and that there are other effective SCM practices. Therefore, in addition to the nine practices identified in Table 2, interviewees were asked to identify additional practices adopted by their firms.

A broad range of SCM practices was included in order to increase the generalisability of the study. However, a focus on upstream and midstream was judged sufficient to address the aims of the study. Hence, downstream SCM practices of distribution, customer service and reverse logistics were not included. A brief outline of each of the SCM practices follows.

**Table 2: Research Framework**

Upstream and midstream supply chain practices	
1. Supplier location/industrial parks	Krugman (1991); Larsson (2002); Sihn and Schmitz (2007); Mondragon and Lyons (2008)
2. Vendor Managed Inventory (VMI)	Angulo <i>et al.</i> (2004); Kuk (2004); Reiner and Trcka (2004); De Toni and Zamolo (2005); Claassen <i>et al.</i> (2008)
3. Just In Time (JIT) and Just In Sequence (JIS) manufacturing	Womack <i>et al.</i> (1990); Larsson (2002); Werner <i>et al.</i> (2003); Mohammadi and Ozbayrak (2006); Mondragon and Lyons (2008)
4. Supplier and Third Party Logistics (3PL) management	Shin <i>et al.</i> (2000); Chen <i>et al.</i> (2006); Narasimhan <i>et al.</i> (2006); Thatte <i>et al.</i> (2008)
5. Information sharing	Funda and Robinson (2005); White <i>et al.</i> (2005); Byrne and Heavey (2006); Zhou and Benton (2007); Sezen (2008)
6. Build to Order (BTO)	Alford <i>et al.</i> (2000); Holweg <i>et al.</i> (2005); Zhang and Chen (2006)
7. Mass customisation	Da Silveira <i>et al.</i> (2001); van Hoek <i>et al.</i> (2001);

	Swaminathan and Nitsch (2007)
8. Cooperation with business partners	Croom (2001); Barratt (2004); Howard and Squire (2007); Redondo <i>et al.</i> (2009)
9. Contingency plans	Christopher and Peck (2004); Giunipero and Eltantawy (2004); Svensson (2004); Sheffi and Rice (2005)

The first SCM practice in Table 2 focuses on locational factors. Sihn and Schmitz (2007) define a supplier park as a cluster of three or more suppliers located close to a final assembly plant. The park includes buildings and infrastructure and is usually purpose-built in order to serve the assembly plant.

In VMI, the vendor is responsible for managing the inventory at the customer's site (Kuk, 2004). A number of studies have shown that VMI adoption brings substantial benefits to companies. For instance, it reduces inventory, administrative costs and lead times (Angulo *et al.*, 2004; Kuk, 2004; De Toni and Zamolo, 2005; Claassen *et al.*, 2008). VMI does have its critics, and a number of studies have found disappointing results and have identified the importance of developing trust and effective information exchange (Barratt, 2004; Peterson *et al.*, 2005).

The just in time (JIT) philosophy advocates the elimination of waste by focusing on quality control and simplifying production processes. Reductions in set-up times, control of material flows and emphasis on preventive maintenance are seen as ways by which excess inventories can be reduced or eliminated, and resources utilised more efficiently (Womack *et al.*, 1990; Larsson, 2002; Werner *et al.*, 2003; Mohammadi and Ozbayrak, 2006; Mondragon and Lyons, 2008).

Supplier selection has been identified as one of the most important issues for establishing an effective supply chain system (Chen *et al.*, 2006). Shin *et al.* (2000) identified a long-term relationship with suppliers and supplier involvement in the product development process as major contributors to improved supply chain performance. Over the last decade, many companies have reduced the number of their suppliers and have sought to develop 'core supplier' programmes in order to foster long-term relationships with a smaller number of suppliers (Sheffi and Rice, 2005).

Increasing the level of integration and information sharing amongst the members of a supply chain has become a prerequisite for improving the effectiveness of supply chains (Funda and Robinson, 2005; White *et al.*, 2005). Sharing timely information among all members of the supply chain has been linked to a number of benefits, including: lower inventories, shorter cash-flow cycle times, reduced logistics and material-purchasing costs, increased workforce efficiency and improved customer responsiveness (Byrne and Heavey, 2006; Zhou and Benton, 2007; Sezen, 2008).

Previous research has shown that a successful implementation of build to order (BTO) can bring enormous benefits and competitive advantage to manufacturers (Alford *et al.*, 2000; Holweg *et al.*, 2005). In particular, Zhang and Chen (2006) provide empirical evidence that mass production and build to stock (BTS) cannot cope with a rapidly changing market, and advocate the adoption of BTO by Chinese automotive manufacturers. However, these authors note some obstacles that seem to occur in rapidly developing markets like China,

such as extremely long lead times for imported parts and an inability to make fast design changes.

One description of the term mass customisation is the ability to produce large volumes of products and services that meet the requirements of individual customers (van Hoek *et al.*, 2001; Swaminathan and Nitsch, 2007). However, this ideal scenario is not practicable in most manufacturing systems, and hence a more pragmatic, narrower description is a system that delivers a wide range of products and services at a cost near to that of mass-produced items (Da Silveira *et al.*, 2001). This narrower definition was adopted in this study.

An increasing number of companies subscribe to the idea that developing long-term coordination and cooperation with business partners can improve the performance of supply chains significantly (Howard and Squire, 2007; Redondo *et al.*, 2009). The benefits of increased coordination and cooperation can include reduced cost of goods, reduced uncertainty around delivery times and quantities and increased quality of goods (Croom, 2001; Barratt, 2004; Howard and Squire, 2007).

It is crucial for companies to be aware of supply chain risks and vulnerability, as any unexpected events or incidents could cause delays or longer-term disruption to their supply chain (Christopher and Peck, 2004; Sheffi and Rice, 2005). To reduce the impact of such events, companies need to be aware of the key areas and causes and be prepared with contingency plans (Giunipero and Eltantawy, 2004; Svensson, 2004).

## **Method**

Since we were interested in the varied, detailed and context-dependent mechanisms that enable isomorphism, a case-study approach was adopted for the research (Eisenhardt, 1989; Hoskisson *et al.*, 1999). The qualitative approach adopted respects the understanding and experience of the senior managers who participated in the study, by allowing them to tell their own narratives or *epilogues* (Dibbern *et al.*, 2008, p. 343), rather than ascribing meaning to, and via, predetermined scales and quantitative patterns.

### **Sampling and Data Collection**

A multiple case-study approach was adopted (Yin, 2003). A pilot case study was undertaken in the UK subsidiary of a foreign-owned MNC (Nissan). The pilot study allowed the interview guide to be tested to ensure both that the topics included in the guide were understood by the interviewees and that the guide could elicit the data that would allow the researchers to address the research questions.

Six case studies were undertaken, as shown in Table 3. The six organisations consisted of three matched pairs with each pair comprising an indigenous Chinese firm and a foreign-owned MNC. Each pair of organisations was from one of three industries: automotive, PCs and mobile phones. The paired nature of the cases allowed comparisons between cases within the consistent context of the same industry. As shown in Table 3, in both the automotive and mobile-phone industries, the indigenous Chinese firms had been established relatively recently. This meant that they were seeking to establish themselves in their domestic market and, hence, could be expected to be seeking to adopt and develop new supply chain practices. The parent organisations of the foreign-owned firms had been established for some considerable time and were all regarded as leaders in their industry. The

foreign-owned firms could be expected to have adopted supply chain practices from their more established parent organisations and therefore provide comparators for the newer, indigenous Chinese firms.

Studying three industries allowed for a degree of analytical generalisation (Yin, 2003). The three industries were chosen to provide a comparison according to characteristics that have been associated with within-industry isomorphic pressures (maturity of industry and rate of technological development) (Coser *et al.*, 1982; McFarland *et al.*, 2008). We recognise that sectors within the automotive industry are highly innovative, such as those developing hybrid and electric vehicles. However, the production of the two automotive firms involved in our study was focused on the production of traditional models and hence, for the purposes of this study, be regarded as following a mature model of auto design and manufacture. In contrast, the high-volume production of mobile phones is relatively recent, causing the mobile-phone industry to be considered a low-maturity industry. The PC industry demonstrates a medium level of maturity and rate of technological development compared to the other two industries selected. Given the spread in the maturity of the industries and in the rate of technological development, it was felt that the study of three industries was sufficient to address the research questions. Since the sampling strategy was based on matched pairs of cases from each industry, this resulted in undertaking six case studies. The appropriateness of undertaking six case studies was demonstrated by ‘saturation’ and ‘consistent regularities’ being achieved during data analysis (Miles and Huberman, 1994, p. 62).

Case studies were based on interviews with key informants who were involved actively in the SCM activities of the case-study organisations. They included staff employed by the organisation, suppliers and third-party logistics providers. The data therefore represent views wider than the dyadic relationships of the focal firms and include multiple levels in the relevant supply chains. The interviews were supplemented by other sources of data including factory visits, documents provided by the interviewees and publicly available data sources (Denzin and Lincoln, 1998). Table 3 shows that a total of 27 interviews were undertaken across the six case-study firms.

**Table 3: Case Study Organisations and Interviewees**

Industry	Firm Type	Case Study Organisation	Founding Year	No of Interviewees
Automotive	foreign-owned MNC	Toyota	Firm: 1937 Chinese subsidiary: 1998	5
Automotive	indigenous Chinese firm	Chery	Firm: 1999	4
PC	foreign-owned MNC	Dell	Firm: 1984 Chinese subsidiary: 1998	3
PC	indigenous Chinese firm	Lenovo PC	Firm: 1984	6
Mobile Phone	foreign-owned MNC	Nokia	Firm: 1865 (mobile phone production: 1971) Chinese subsidiary: 2002	5
Mobile Phone	indigenous Chinese firm	Lenovo Mobile Communication	Firm: 2002	4
			Total	27

Consistent with other case-based research, interviews were guided by a semi-structured interview guide (Bryman, 2004), which is shown in Appendix 1. Interviewees were asked about their organisation's adoption and use of each of the SCM practices shown in the research framework (Table 2) and any additional SCM practices used by their organisation. The researcher was alert to descriptions about the mechanisms that influenced or aided the adoption of SCM practices and, where appropriate, posed supplementary questions about these.

### **Data Analysis**

The interviews were recorded and fully transcribed. Interviews were conducted in the local language and transcriptions were translated into English. The translated transcripts were coded using tabular layouts in a word-processing package. Coding was undertaken in two cycles: first, coding was carried out according to the SCM practices shown in Table 2; the data were then coded further to reflect the isomorphic mechanisms shown in Table 1. Coding was therefore predefined or 'template-coding' (Dey, 1993; Miles and Huberman, 1994). These emergent codes were then matched with the mechanisms identified in Table 1. Coding was initially undertaken within each of the six cases. Comparison of findings across the six cases was then undertaken.

### **Internal and External Validity**

Internal validity was increased by combining data from multiple interviewees with differing roles in their firm's SCM activities, and by including managers from suppliers and third-party logistics providers. Where possible, this was augmented by additional sources of data, such as site observations and documentary evidence. Internal validity was also increased by involving multiple researchers in the coding and data analysis processes.

External validity is concerned with the generalisability of the findings of the study. Whilst the study did not intend to achieve statistical generalisation, theoretical generalisation was achieved by adopting a multiple case-study approach (Yin, 2003). External validity was addressed by including case studies spanning a range of manufacturing industries and a range of SCM practices.

## **Findings**

### **Similarities among SCM Practices of Indigenous Chinese Firms and Foreign-owned MNCs**

In order to address the first of our research questions, Table 4 presents a comparison of the SCM practices identified in the two automotive case studies, Toyota and Chery. Similar analysis for the other two industries, PCs and mobile phones, is provided in Tables A1 and A2 in Appendix 2.

**Table 4: Comparison of SCM Practices Between Toyota and Chery**

	<b>Toyota</b>	<b>Chery</b>
<b>1. Supplier location/industrial parks</b>	Both firms have established an industrial park and have identified criteria by which suppliers can join the park.	
	The industrial park was planned at the initial stage of business development and business partners were involved from the early planning stage.	Did not establish an industrial park at the beginning owing to lack of scale. Gradually attracted suppliers to join the industrial park as scale grew.
<b>2. VMI</b>	Both firms have adopted VMI for part of their inventory management.	
	Toyota helps suppliers to reduce inventories in their plant and warehouses by sharing accurate forecasts and production schedules.	At the beginning, suppliers were unwilling to adopt VMI with Chery.
<b>3. JIT and JIS manufacturing</b>	Both highly value JIT and JIS and have a tiered approach to parts delivery, with suppliers located near the plant delivering parts directly to the assembly line and parts from some domestic and a few overseas suppliers to the warehouse near the factory. Parts are delivered to the production line in the required sequence. Both firms have adopted Kanban systems.	
	Reliability of delivery of parts from overseas suppliers is an issue and, hence, parts are kept in safe inventory near the plant.	Some domestic suppliers still deliver parts independently.
<b>4. Supplier and 3PL management</b>	Both firms have implemented performance measurement systems for supplier evaluation: Toyota has TQM (Total Quality Management) and QPI (Quality Performance Indicator); Chery has PMI (Performance Management Indicator).	
	Training and development are given to suppliers. Owing to ‘guanxi’ (the importance placed on personal connections in Chinese society), it was stated that it was very unlikely that underperforming suppliers would be replaced.	Financial penalties were imposed on underperforming suppliers, but money raised from penalties was used to help suppliers improve their performance.
<b>5. Information sharing</b>	Both claimed that they have achieved information sharing with business partners as a result of investments in inter-organisational IT.	
<b>6. BTO/BTS</b>	100% BTO, however customers have to wait for a few months for a new vehicle to be built.	Moving from 100% BTS to a combination of BTO and BTS. Chery was trying to realise more BTO by letting its

		dealers generate forecasts and allowing them to place orders eight times per month.
<b>7. Mass customisation</b>	Both of the companies clearly stated that they have achieved mass customisation, and with similar enablers, such as Kanban systems and JIS parts delivery to the assembly line.	
<b>8. Cooperation with business partners</b>	Both emphasised the importance of cooperation with business partners.	
	Share risks and benefits and have established long-term, trusting and collaborative relationships with suppliers.	Competitive relationships with business partners, e.g. imposing penalties. Seeking to reduce number of suppliers.
<b>9. Contingency plans</b>	Toyota has arranged back-up plans with its business partners and stated that every party knew what to do if disruption happened.	Interviewees seem to be aware of possible supply chain disruptions; however, there was no solid evidence that Chery was prepared with back-up plans to deal with supply chain risks.
<b>10. Additional practices</b>	SCM continuous improvement and learning from rivals and companies in other industries.	Hiring experts and consultants to improve its SCM.
	Job rotation to increase flexibility.	

The findings presented in Table 4 and the equivalent tables in Appendix 2 suggest what DiMaggio and Powell (1983, p. 148) refer to as a ‘*startling homogeneity*’ between the SCM practices of the paired firms. Where differences were identified, these were often the result of a difference in when the firms in a pair could develop a practice. The firm in the pair that had developed the practice first was often at a greater level of maturity with the practice than the firm that was later in developing the practice.

For example, the comparison of Toyota and Chery, summarised in Table 4, shows that both firms had developed a supplier park close to their manufacturing plants (e.g. Sihn and Schmitz, 2007; Mondragon and Lyons, 2008). However, Toyota had established its park when it first started large-scale production in China in 1999. Chery started production at about the same time. However, Chery was only founded in 1997 and it did not have the scale or legitimacy of Toyota. Hence, initially, Chery could not attract suppliers to establish a base near to its production facilities, as described by one of the interviewees from Chery:

*‘At the beginning, owing to limited production; there were no suppliers who wanted to be relocated close to the plant. Supplier A, who provides seats, was located more than 1,000 kilometres away from our plant ... with the development and further expansion of our production volume, more and more suppliers are willing to join the supplier cluster. In 2001, supplier A set up a subsidiary factory near the plant to cater for the needs of Chery ... .’* [Interviewee 1, Chery]

Hence, Chery had not been able to develop a supplier park at the start of its operations, but had to develop it over time as its production and legitimacy with its suppliers grew. This is consistent with previous studies of the establishment of supplier parks (Larsson, 2002).

Similarly, Chery initially had difficulties in implementing vendor-managed inventory (VMI), since suppliers were reluctant to establish such supply arrangements with a newly formed firm with low production volumes. Only after Chery became well established with significant production volumes would suppliers agree to VMI arrangements. Again, the need for legitimacy and scale is consistent with previous studies of VMI (Claassen *et al.*, 2008).

As summarised in Table A1, Lenovo PC reported similar difficulties in establishing VMI:

*‘Lenovo is one of the first companies to implement VMI amongst the Chinese domestic IT enterprises, but to be able to realise VMI, you need to achieve certain economies of scale ... .’* [Interviewee 5, Lenovo PC]

All three industries provided examples of the Chinese firm adopting similar practices to the foreign-owned MNC, but adopting the practice later and therefore being at an earlier stage of adoption. This accords with notions of diffusion of practices within firms, and hence increasing levels or degrees of adoption (e.g. Daniel *et al.*, 2012) as distinct from diffusion across an industry (Rogers, 1995). For example, Dell described how it had completed a supplier rationalisation programme, whilst Lenovo PC described how it was in the process of reducing supplier numbers:

*‘ ... at the beginning in 1999, we had more than 200 suppliers; now we’ve reduced that to about 50 suppliers – those are our core suppliers and around 95% of parts and components supply are from them ... .’* [Interviewee 2, Dell]

*‘If we could reduce the number of suppliers, we could negotiate a lower price since we would give more orders to one supplier and we are likely to achieve a better price ... .’* [Interviewee 6, Lenovo PC]

Other examples of the adoption of identical practices, but with a time lag, were found between Dell and Lenovo PC in the achievement of information sharing in the supply chain and development of contingency plans.

Comparison of the firms studied in the mobile-phone industry provided similar examples of adoption of identical practices, but with the indigenous Chinese firm’s adoption being later than that of the foreign-owned MNC. For example, at the time of the study, Nokia had already implemented JIT manufacturing, had a significant degree of parts standardisation and had developed full contingency plans. Meanwhile, interviewees in the indigenous Chinese firm, Lenovo Mobile Communication (LMC), described still being in the process of adopting these practices, for example, in the case of parts standardisation:

*‘At the moment, we are trying to achieve standardisation for some components. This would be a new development for our company ... .’* [Interviewee 2, LMC]

### **Mechanisms of Influence**

In order to address our second research question, evidence was sought for the mechanisms summarised in Table 2. The mechanisms identified in the case studies are discussed below and summarised in Table 5.

#### **i. Coercive Pressures**

Whilst the above discussion has suggested that the indigenous Chinese firms studied are in the process of adopting practices similar to those of the foreign-owned MNCs, evidence was also found that the MNCs were influenced by isomorphic pressures. Consistent with coercive isomorphism (DiMaggio and Powell, 1983; Teo *et al.*, 2003), an interviewee from Toyota described how the Chinese concept of ‘guanxi’ influenced their treatment of suppliers and logistics providers:

*‘ ... due to the ‘guanxi’ and reciprocal relationships that exist in China, it is very unlikely that an underperforming supplier or 3PL will be replaced by Toyota ... .’* [Interviewee 1, Toyota]

Another mechanism by which coercive isomorphism was found to operate in the case studies was in meeting government requirements (Zsidisin *et al.*, 2005; Williams *et al.*, 2009) in this case regarding the payment of customs and excise duty. In the mobile-phone industry, Nokia described how, in 2002, it developed a bonded warehouse (Neace, 1965; Firoz and Murray, 2003) to simplify the payment of duty and improve its own cash flow:

*‘ ... now we found a better way of doing it. Now the entire hub is seen as a fully bonded warehouse – parts will all be sent to the warehouse, and there it will generate a receipt record which is linked to the Customs and Excise Department system. ... At the end we only pay tax if the finished goods are going to the Chinese domestic market ... .’* [Interviewee 1, Nokia]

Interviewees at LMC described how, five years later, they were developing a similar bonded warehouse based on the original development by Nokia.

An unusual example of control by a parent organisation, another mechanism by which coercive pressures can operate (Teo *et al.*, 2003), was provided by Lenovo PC. Lenovo announced the acquisition of IBM's Personal Computing Division in 2004 (Lemon, 2005). Whilst Lenovo was effectively the parent firm, an interviewee described how IBM's approach of building to stock was influencing the supply chain strategy of Lenovo PC:

*' ... after the acquisition of IBM laptop division – because IBM does not accept customer configurations and only sell from stock from what is produced – we need to keep IBM's manufacturing strategy as well.'* [Interviewee 6, Lenovo]

## **ii. Mimetic Pressures**

In addition to coercive pressures, the case organisations demonstrated a range of mechanisms consistent with mimetic isomorphic pressures (DiMaggio and Powell, 1983; Teo *et al.*, 2003). For example, the supporting documentary evidence used in the preparation of the case studies described how Lenovo PC had recruited staff from other leading PC manufacturers, including Dell:

*' ... in September 2006, Lenovo Group announced that Gerry P. Smith had been appointed senior vice president, Global Supply Chain. ... Mr. Smith most recently served as a vice president running Dell's Singapore Design Center ... .'* (EDNAsia.com, 2006)

Chery described how it had consciously hired foreign experts to advise on supply chain issues in order to learn about best practices used by international firms:

*'In 2003, we founded a research and development organisation, and enhanced collaboration with foreign consultant firms in order to improve the technology and quality. So far, there are more than 20 foreign experts working in the different factories of the Chery automotive company ... .'* [Interviewee 1, Chery]

A respondent at LMC described how customer demand in the mobile-phone market for new models and new technologies was responsible for the firm seeking to develop its own R&D capability. Nokia already has such a capability. Hence, the customer demand has resulted in the two firms becoming more similar.

*' ... being able to provide new technology and new models to the fast-changing market would make Lenovo [mobile phone] more competitive in the industry ... . Now more than 80% of models are developed independently [by LMC] ... .'* [Interviewee 2, LMC]

## **iii. Normative Pressures**

Similarly, the case organisations demonstrated a range of mechanisms consistent with normative isomorphic pressures (DiMaggio and Powell, 1983; Teo *et al.*, 2003). For example, interviewees at Lenovo PC recognised Dell as a leading firm in their industry and sought to describe how they were trying to achieve similar approaches to those adopted by Dell:

*‘ ... it is very hard to keep zero inventory like Dell; they have adopted 100% BTO and we only partially apply BTO .... ’ [Interviewee 6, Lenovo PC]*

Another mechanism which is associated with normative pressures is similar job titles and career paths, which contribute to the formalisation and structuring of functional fields (DiMaggio and Powell, 1983). A high degree of consistency between job titles was apparent amongst the case-study interviewees, both between firms in the same industry and across the three industries.

As described earlier in the paper, a number of educational institutes and training providers are now providing formal educational qualifications and on-going professional training in elements of SCM. The staff interviewed as part of the case studies had a mixture of such formal qualifications and training in SCM.

**Table 5: Examples of Isomorphic Mechanisms Identified**

<b>Coercive</b>	
Local culture	Recognition of ‘guanxi’ by Toyota in its dealings with suppliers.
Government requirements	Requirement to pay import taxes led to development of bonded warehouse by Nokia in order to facilitate payments. LMC developed a similar bonded warehouse five years later.
Requirements of funders	Need of firms in all three industries to attain productivity and profitability levels of others in the same industry to secure investment (leads to VMI and JIT).
Influence of parent organisation on subsidiaries	Integration of IBM’s manufacturing strategy in Lenovo PC’s strategy following the reverse takeover of IBM.
Need to mirror other organisations in order to interact easily	Adoption of accepted delivery patterns by both automakers (e.g. ‘milk run’ – a designated route for pickups or drop-offs from multiple suppliers) allowed easier interaction with third-party logistics providers.
<b>Mimetic</b>	
Employee transfer	Lenovo PC hired executives from international PC firms, including Dell.
Consulting firms	Chery’s concerted use of foreign supply chain experts throughout its factories in order to facilitate the adoption of new technologies and supply chain approaches (e.g. JIT).
Industry associations	Industry associations (e.g. The Chinese Automobile Manufacturers Association) in all three industries. Staff members in all six case-study organisations were involved in such associations.
Wide or demanding customer base	Customer demand in the mobile-phone industry for new models and new technologies led LMC to develop its own R&D capabilities.
<b>Normative</b>	
Formal educational programmes	A number of leading Chinese universities now offer degree-level studies in SCM and logistics. Non-Chinese universities and business schools also offer similar courses in China and attract significant numbers of Chinese students to study SCM outside China.
Training	Many educational institutions provide SCM training courses. Staff in the case-study organisations had attended external SCM training

	courses and also internal training courses provided by consultants (e.g. Six Sigma).
Professional networks and trade associations	See comment on industry associations above.
Recruitment policies	Respondents stressed the importance of qualifications and industry experience in recruitment, suggesting significant influence of universities and leading firms in promulgation of normative pressures.
Legitimacy of key (central) firms in industry	Recognition by Lenovo PC of Dell as a leader in the PC-manufacturing industry. Recognition by Chery (and most other auto manufacturers) of the Toyota Production System.
Common job titles and career paths	Similar job titles of case-study interviewees, both within each of the three industries and across the three industries studied. Chinese respect for authority and experience results in recognition and extensive use of job titles within the firms and when interacting with other firms, such as supply chain partners and firms in professional networks.

## Cross Industry Comparison

In addition to the ‘*startling homogeneity*’ between the paired cases, a comparison of Tables 4, A1 and A2 shows a very high degree of homogeneity in practices across the three industries. For example, both types of firms in all three industries had developed supplier parks, implemented VMI, were practising JIT manufacturing, emphasised cooperation with suppliers and had developed contingency plans. The few differences that were observed related to the differing nature of their products (Christopher, 2000). In the automotive and PC industries, the firms adopted a JIS and BTO production model in order to meet the specifications of customers. In contrast, mobile handsets are made in large volumes and, hence, a BTS model was adopted by the firms in this industry. Similarly, the respondents in the mobile-phone industry described the development of a bonded warehouse to aid tax payment on imported parts that were due for inclusion in handsets for export (Neace, 1965; Firoz and Murray, 2003). Such a scheme was less relevant to the firms in the other industries.

This homogeneity across industries suggests that the isomorphic pressures operating among firms within an industry also operate strongly across industries. This phenomenon has not been addressed in previous studies, which have all tended to focus on one industry (for example, McFarland *et al.*, 2008; Williams *et al.*, 2009). A detailed study of the nature of cross-industry pressures and the mechanisms by which they operate is beyond the scope of this study. However, in considering the mechanisms identified in Table 1, examples of all three types of pressure acting across the three industries could be identified (see Table 6).

**Table 6: Examples of Cross-Industry Isomorphic Pressures**

Isomorphic pressure	Mechanisms that act across industries (from Table 1)	Examples from study
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Coercive	Need to mirror other organisations in order to interact easily.	PC and mobile-phone industries have major components in common that are sourced externally (e.g. processor chips) – need to interact with the suppliers of these components.
Mimetic	Employee transfer  Demanding customer base	Employees had transferred between the PC and mobile-phone industries. Evidence was not found of transfer between the automotive and other industries. Firms across industries had developed contingency plans as a means of ensuring continuous provision to customers.
Normative	Formal education programmes  Legitimacy of key firms – both in their own industry and other industries  Legitimacy of certain SCM practices  Similar job titles and roles	Formal education courses are not industry specific and attract individuals from a broad range of industries.  Leading firms such as Toyota act as a model for manufacturing in industries outside automotive.  Firms from all three industries adopted similar approaches to establishing a supplier park, VMI, JIT.  Firms from all three industries used similar job titles and roles

In addition to considering isomorphism across industries, cross-case comparison raises the question of a comparison of within-industry isomorphism; that is, which industries experience higher levels of isomorphic pressures and what are the reasons for these differing levels of isomorphic pressures? Previous studies suggest that more mature industries will be more homogeneous (Coser *et al.*, 1982). This suggests that the automotive firms in this study should show a greater degree of homogeneity than the other firms studied. However, other studies also find that a greater dependence on other firms will lead to greater isomorphism (McFarland *et al.*, 2008); hence, firms in industries with less vertical integration, such as the PC and mobile-phone industries, will experience high levels of isomorphism. Previous studies also suggest that *'the greater the extent to which technologies are uncertain ... the greater the rate of isomorphic change'* (DiMaggio and Powell, 1983, p. 156). This suggests that firms in industries in which technology is newer and hence less certain, such as the PC and mobile-phone firms, will experience greater levels of isomorphism. Taken together, these provide reasons why the firms in all three industries studied demonstrated similar levels of within-industry isomorphism: the automotive firms studied owing to the maturity of the designs and manufacturing approach being used, and the PC and mobile-phone firms owing to lower levels of vertical integration and the impacts of newer and less certain technologies.

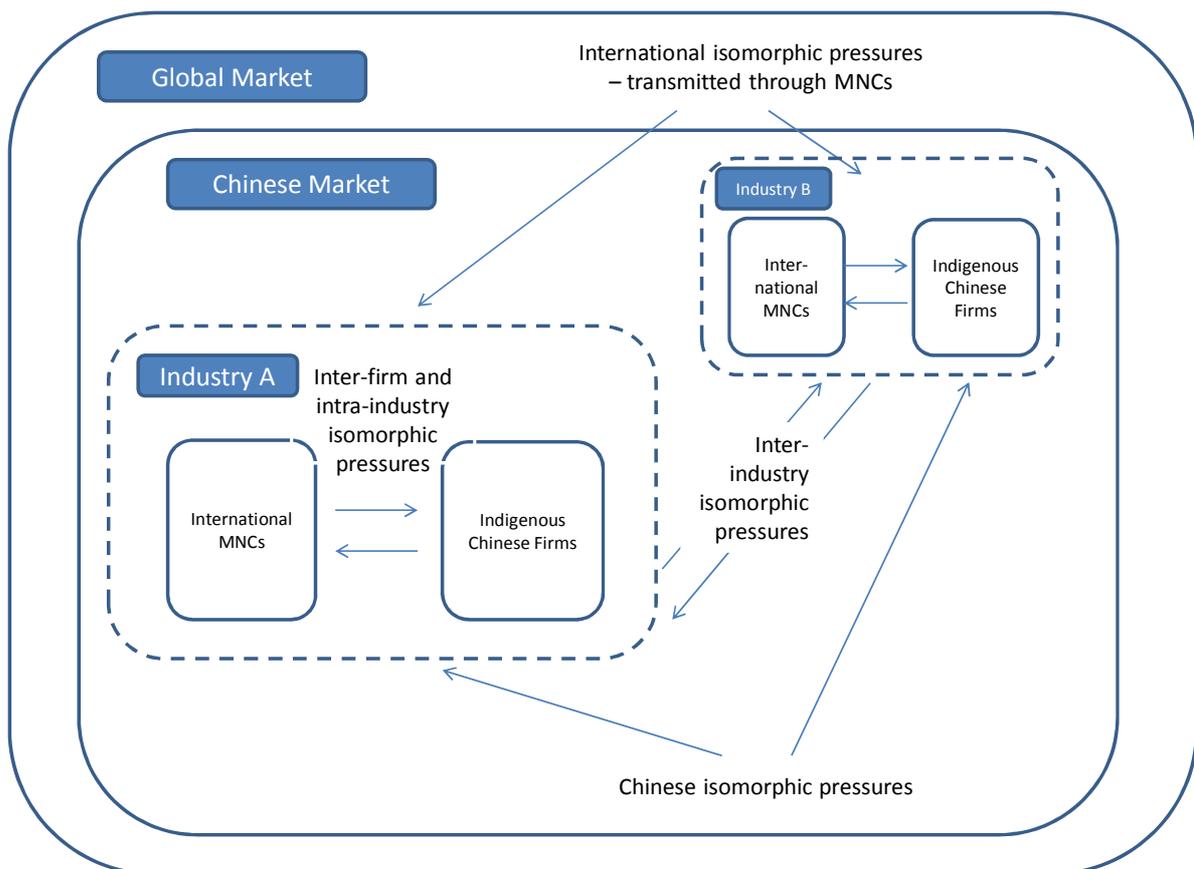
## Discussion and Conclusions

Previous studies have shown that institutional pressures are more important in the adoption of supply chain practices than strategic or structural considerations (e.g. Ketokivi and

Schroeder, 2004; Huang *et al.*, 2010). The contribution of this study is to provide empirical evidence of the detailed mechanisms through which those institutional pressures operate.

The findings show that the isomorphic nature of some of the mechanisms is explicit – for example, employing consultants with experience at other firms in the same industry in order to learn accepted or common practice (Teo *et al.*, 2003). The isomorphic nature of other mechanisms may be more implicit, for example, recruitment practices (DiMaggio and Powell, 1983). This suggests that whilst some modelling may be intentional, some of it may be unwitting. For example, firms that implement a recruitment policy giving preference to certain universities or certain previous employers may be seeking to recruit what they believe are the best candidates. However, unwittingly they are increasing the probability that the firm will adopt the same practices as the other firms hiring from the preferred universities or the preferred previous employers. Hence, whilst firms, including both the foreign-owned MNCs and indigenous Chinese firms included in this study, are proud of their innovation capabilities, these may unwittingly be eroded by the mechanisms identified in this study.

The wide range of mechanisms identified suggests that isomorphic pressures on both types of firm arise from a range of sources, both within and outside the Chinese context. The key sources of pressures are shown in Figure 1. These sources are discussed below.



**Figure 1: Isomorphic pressures acting on case-study firms**

An example of mimetic pressures arising from the international market is Chery's use of foreign consultants in its factories in order to support the adoption of SCM practices that are recognised as good practice outside China. Chery was proud of its use of such consultants and had dispersed them across its factories to ensure widespread influence within the firm. Similarly, Lenovo PC purposely hired foreign executives from other PC manufacturers in order to benefit from their knowledge and experience. Studies of the role of consultants often focus on knowledge transfer between the consultants and the firm that has engaged them (Kim and Inkpen, 2005; Ko *et al.*, 2005; Malhotra *et al.*, 2005). This study highlights that consultants can also be a source of mimetic isomorphism, encouraging the adoption of similar practices both within and across industries.

The highly demanding customer in China provides an example of a mimetic pressure. Consistent with the success orientation of the Chinese culture (Hofstede, 2003), there is a high demand for branded mobile phones and models with the latest features, since these are viewed as status symbols (Hitt *et al.*, 2004; Li and Li, 2010). Interviewees at LMC described how they had developed their own R&D capabilities, similar to those of the foreign-owned MNC, Nokia, in order to be able to meet the demands of the Chinese market. However, the isomorphic pressures from the Chinese context influence not just the indigenous Chinese firms studied. The automotive manufacturer, Toyota, described how, when operating in China, it recognised the Chinese concept of 'guanxi' when dealing with its suppliers. This emphasises that the transfer of practices is not simply unidirectional from foreign-owned MNCs to indigenous Chinese firms, and demonstrates that foreign-owned MNCs are also affected by the local environment.

This study has found that there is a high degree of homogeneity between the types of firms studied and across the three industries. However, we recognise that whilst firms may demonstrate homogeneity at some levels, there may be heterogeneity at other levels. For example, Westney and Zaheer (2001, p. 349) observe that '*multinational organisations are substantially different from domestic firms, and some of these differences are not only "in degree" but also "in kind"*'. The qualitative nature of our study and the considerable amount of data collected allowed us to consider which practices had been adopted by each firm and the level of adoption; for example, where adoption lagged between the paired cases. However, we recognise that the detailed execution of the practices may differ between the firms. This may include the ceremonial adoption of practices, which is where isomorphic pressures cause firms to seek to adopt certain practices, but they are either unwilling or unable to implement these effectively (Cerdin, 2003; Fenton-O'Creevy, 2003).

## **Implications for Theory Development and Practice**

This study contributes to theory development by demonstrating empirically the varied mechanisms identified in Table 1. It is almost three decades since DiMaggio and Powell identified the three isomorphic pressures. Over this time, there has been little development of this aspect of institutional theory. Identification of the individual mechanisms in this study offers an opportunity to consider isomorphism at a greater level of detail, and hence the possibility of extending or generating new theory in this area. For example, the identification of the underlying mechanisms provides an opportunity to consider which ones most rapidly result in homogeneity, and if and why their effect varies by SCM practice or by industry.

Most institutional-theory-based studies have considered a single industry (e.g. McFarland *et al.*, 2008) and, hence, the consideration of isomorphic pressures has tended to be within a single industry. This study further contributes to theory by introducing the notion of cross- or inter-industry isomorphic mechanisms (Table 6); that is, mechanisms that can operate across industries.

The findings also make an important contribution to practice, since it is at the level of the individual mechanisms that managers and policymakers can most readily and easily take action. The findings of this study are particularly useful to practitioners who wish to adopt good practice, as well as those seeking to promote diversity of practices within their firm or across their industry. For those seeking to model their practice on that of other firms, Table 5 identifies specific mechanisms that they can use. Whilst some of these may be well known, for example, the use of consultants, the richness and diversity of the mechanisms shown in Table 5 allow the consideration of other mechanisms that can support adoption, such as recruitment practices and adopting standard job titles and role definitions. The mechanisms appear self-reinforcing, and hence addressing more than one of them at a time can be expected to aid the adoption of the selected practices. Conversely, for those practitioners seeking to promote diversity, Table 5 can act as a checklist to ensure that their firms are not unwittingly acting in ways that are likely to promote homogeneity, for example, recruiting from a limited number of universities or former employers.

The high degree of homogeneity identified also raises questions for educators and other advisors to firms. Whilst the professionalisation of the SCM field has undoubtedly allowed many firms to benefit from good practice, it would appear that the underlying formalisation of the cognitive base of the field and formal education programmes promoted by universities is leading to an apparent hegemony of certain practices. This causes the development of alternative approaches, particularly approaches that may be sensitive or relevant to certain geographical or cultural contexts, to be overlooked, resulting in a fulfilment of the observation '*despite considerable search for diversity, there is relatively little variation to be selected from*' (DiMaggio and Powell, 1983, p. 152).

## **Implications for Policy**

Chinese government policy has been important in the country's transition from a command economy. Consistent with the long-term perspective associated with the Chinese culture (Hofstede, 2003), the government has encouraged the development of a stable and supportive institutional environment (Hitt *et al.*, 2004). For example, over the past 30 years the government has established a number of Special Economic Zones (SEZs), allowing certain regions to develop flexible economic policies conducive to trade that do not exist in the rest of China (Yue-man *et al.*, 2009; Roy Choudhury, 2010).

The work suggests a number of possible implications for policy. For example, the study found that Chery had difficulty attracting suppliers to locate close to its plant because the firm lacked legitimacy. Policymakers could address this issue by encouraging a number of manufacturers, particularly new manufacturers, to establish their plants relatively close to each other, for example by providing tax incentives. Suppliers would then be attracted to the area as they could supply more than one customer, hence reducing their reliance on an individual customer. Clustering of supply chains and production is beneficial to manufacturers as well as suppliers, as it reduces the chances of supply disruption. Clustering

can also provide the basis for further inward investment. For example, in the case of investment in the USA, the major Japanese automotive manufacturers developed their production around Detroit, as there was already an established cluster of automotive suppliers in the area (Womack *et al.*, 1990). For governments, clustering also minimises the infrastructure costs and environmental impacts (Sturgeon *et al.*, 2008).

The findings also suggest that there is clear scope for host governments to learn from MNCs and, as a result, introduce innovations that benefit indigenous firms. The example of the bonded warehouse illustrates this. Nokia instigated the innovation, which required significant changes within the Chinese import–export taxation system. It took five years for a similar system to be developed by Lenovo Mobile Communication, which represents a considerable delay in the timescales of the mobile-phone industry. Governments in both the East and West could make efforts to learn from the MNCs they host and develop systems to diffuse innovations rapidly to indigenous companies.

The example of the bonded warehouse raises the issue of the power of international MNCs through their foreign direct investment (FDI). It is apparent that established MNCs can exert considerable pressure on host governments. Governments negotiating FDI terms and agreements would be advised to ensure that any resulting developments and innovations benefit indigenous firms in the shortest time possible. Host governments, including the authorities in the SEZs in China, have tended to focus on encouraging joint ventures between indigenous firms and inward-investing MNCs. The current study shows that there is a range of mechanisms by which knowledge and expertise are transferred effectively between firms that are not in direct partnerships, as detailed in Table 1. Host governments should therefore broaden their focus from the establishment of joint ventures to include initiatives such as enabling the secondment of experts from other firms and nations, the participation of both indigenous and MNC firms in industry associations and functional networks and recognition of professional qualifications and titles. As discussed in the literature review, the effectiveness of institutional pressures in causing the adoption of supply chain practices, compared to strategic and structural considerations, implies that a governmental focus on mechanisms which can facilitate such institutional pressures would be expected to have a significant impact on the adoption of SCM practices.

## **Limitations of Study and Further Research**

As with all studies, the limitations of this research should be recognised. As discussed in the methodology section, a qualitative approach was adopted in order to reveal the rich and varied range of mechanisms through which isomorphic pressures might operate in the context studied. The intention was to achieve analytical generalisation rather than statistical generalisation. Further studies could seek to replicate this study in other rapidly developing economies, for example India, Russia or Brazil, in order to determine to what extent firms in these markets are also experiencing the high levels of isomorphic pressures identified in this study, or if they have managed to protect a greater degree of diversity amongst firms.

As noted above, the qualitative nature of this study allows us to explore which practices have been adopted and the degree of adoption. It also allows us to identify examples of the mechanisms through which the isomorphic pressures operate. However, we are aware that the breadth of this study resulted in a limitation in the depth achieved. Future studies could seek to explore the adoption and implementation of fewer practices but in greater depth, to

allow greater detail of the execution of the practice to be studied. This may allow examples of ceremonial adoption (Cerdin, 2003; Fenton-O’Creevy, 2003) to be identified and explored. It may also enable an exploration of how the different mechanisms identified in Table 5 work in detail, and how their dynamic interaction influences the nature of adoption and execution.

Finally, the empirical findings shown in Table 5, could form the basis of a quantitative, survey-based approach, in order to provide a wider, statistically based test of the findings of this study, which, unlike previous quantitative studies, reflects the true richness and diversity of the mechanisms through which isomorphic pressures operate.

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## Appendix 1

### Interview Guide

The following was used as an interview guide, rather than a questionnaire. It was used to prompt and guide discussion – informants were encouraged to engage in discussion with the interviewer, hence encouraging the informants to describe their own and their firms' experiences, rather than being prompted and constrained by fixed questions.

<b>Interviewee</b>	
	What is your current role in the company and how long have you worked here? ( <i>Record formal title, e.g. via exchange of business card or by direct question.</i> )
	What is your background and experience in SCM? ( <i>Interviewer alert to discussion of formal qualifications, training courses and professional networks and probed for further information about these when they were elicited.</i> )
<b>Company Product</b>	
	Can you describe the key characteristics of your products/industry? (product life-cycle, product variety)
<b>SCM Practices</b>	
	Can you please describe your company's adoption and use of the following SCM practices? ( <i>During responses, the interviewer was alert to descriptions of why and how the practices had been adopted, i.e. possible isomorphic mechanisms, and probed for further information about these possible mechanisms; e.g. if the informant referred to actions of other firms, the interviewer would ask which other firms and how the focal firm became aware of actions of other firms.</i> )
	• Locating suppliers close to your production plant (i.e. a supplier park)
	• Vendor-managed inventory (or supplier-managed inventory)
	• JIS and JIT manufacturing
	• Supplier (including logistics suppliers) management
	• Information sharing in the supply chain
	• Build to order/Build to stock
	• Mass customisation
	• Cooperation with business partners
	• Contingency plans
	Are there any other SCM practices that your company has adopted recently? Can you please describe them?

## Appendix 2

**Table A1: Comparison between Dell and Lenovo PC**

	<b>Dell</b>	<b>Lenovo PC</b>
<b>1. Supplier location/industrial parks</b>	Both have established industrial parks close to their production facilities.	
<b>2. VMI</b>	Both companies have adopted VMI and both seek to help their suppliers to reduce inventory. Lenovo reported difficulties in establishing VMI when it first started production.	
<b>3. JIT and JIS manufacturing</b>	Dell interacts with key suppliers and 3PLs frequently for JIT/JIS manufacturing. Parts are sorted in the requested sequence by the suppliers/3PLs.	Three types of deliveries provided by its suppliers and 3PLs, with sorting area for sequencing of parts.
<b>4. Supplier and 3PL management</b>	Both firms have management and appraisal systems for suppliers and offer supplier training and development. Dell has reduced supplier numbers whilst Lenovo is seeking to reduce supplier numbers.	
<b>5. Information sharing</b>	Dell shares information via extranet – business partners are able to access up-to-date production information. Lenovo making gradual improvement in information sharing.	
<b>6. BTO/BTS</b>	100% BTO.	A combination of BTO and BTS to adhere to IBM's business strategy of selling from stock.
<b>7. Mass customisation</b>	Both able to mass-produce PCs with different customer configurations.	
<b>8. Cooperation with business partners</b>	Both firms seek to develop long-term relationships, including helping suppliers reduce their inventory, providing training for suppliers and sharing contingency plans and joint development of new products or modularisation of products.	
<b>9. Contingency plans</b>	Both firms recognise the importance of contingency plans. Dell has an executive contingency department that deals with supply chain disruptions, whilst at Lenovo, developing contingency plans was seen as part of its collaboration with business partners.	
<b>10. Additional practices</b>	Developing parts modularisation and standardisation.	

**Table A2: Comparison between Nokia and Lenovo Mobile Communication (LMC)**

	<b>Nokia</b>	<b>LMC</b>
<b>1. Supplier location/ industrial parks</b>	Both emphasise the importance of the industrial park and have established an industrial park.	
		Acknowledged the difficulties for small-scale manufacturers to attract suppliers to form an industrial park.
<b>2. VMI</b>	Has realised VMI.	Has not realised VMI yet, owing to VMI needing strong buying and bargaining power. Viewed VMI as an opportunity to transfer stockholding to suppliers.
<b>3. JIT and JIS manufacturing</b>	Production plans updated weekly and merged with real orders. JIT manufacturing was achieved and supported with integrated supply chain systems, information sharing and collaboration with 3PLs and suppliers.	Has not achieved JIT manufacturing and production plans were mainly based on forecasts.
<b>4. Supplier and 3PL management</b>	Both firms have strict supplier selection, supplier performance-evaluation systems and collaborative schemes with suppliers.	
<b>5. Information sharing</b>	Both achieved information sharing with business partners via integrated systems. In the case of Nokia, this includes information sharing with government agencies.	
<b>6. BTO/BTS</b>	Both applied majority of BTS and a little BTO.	
<b>7. Mass customisation</b>	Both applied mainly mass production for their manufacturing.	
<b>8. Cooperation with business partners</b>	Has developed strategic and collaborative partnerships including involvement in new product development.	Would like to have collaborative relationships with suppliers. Has begun by consulting suppliers about new product development.
<b>9. Contingency plans</b>	Supply chain risk management is seen as a high priority and contingency plans have been developed for all parts of the supply chain.	Risk management recognised. However, only disruption in parts supply has been addressed by identifying multiple suppliers.
<b>10. Additional practices</b>	Has already developed some standardised parts.	Expressed an intention to move to greater parts standardisation.
	Bonded warehouse for imported parts – simplifying the procedures for parts	Developed similar warehouse five years after Nokia.

	procurement.	
	Has been focusing on R&D in China.	Developing own R&D capabilities.