The dynamics of innovation in Malaysia’s wooden furniture industry: Innovation actors and linkages

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Abstract

As a low-tech, labour intensive and supplier-dominated industry, the wooden furniture industry's pattern of innovation is widely acknowledged as business driven. This paper’s main objective is to ascertain the roles played by the various innovation actors and their linkages to the process of technological innovations in the wooden furniture industry. Empirical evidence is derived from a narrative case study of the Muar furniture cluster in Malaysia. The main findings from this study indicate that the dynamics of innovation in Malaysia’s wooden furniture industry are mainly business-led and are characterised as collective innovation. In this regard, the roles played by the immediate business environment such as suppliers, customers, competitors, and retailers are of paramount importance. These innovation actors have been linked closely to firms in their surge for technological advancement. Universities and government organisations do not feature in the operations of these firms.

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1. Introduction

It is a current trend among empirical studies of industrial innovation to define innovation system frameworks at different levels for different purposes of analysis (Markard and Truffer, 2008). In this context, innovation is seen as a collective societal process with firms as the core actors in a networked social context (Köhler, 2008). These actors are engaged continuously in the processes of learning and knowledge accumulation (Nelson and Winter, 1982). The relationships between firms and other actors in innovation systems involve both market and non-market links. Indeed, these relationships form the links among the actors and provide room for interactions that eventually contribute to system dynamics (Carlsson et al., 2002). In the realm of Science, Technology and Innovation (STI) policy, innovation system frameworks have led to a more integrated approach to the delivery of innovation-related policies (Lundvall and Borrás, 2005; OECD, 1997, 2005).

At the sectoral level, sectors are composed of heterogeneous agents, comprising organisations or individuals. In this regard, the Sectoral Innovation Systems approach postulates that innovation patterns are different and highly idiosyncratic across sectors. Understanding the key sectors that drive an economy, with all their specificities, will help in understanding national growth and national patterns of innovative activities (Malerba, 2002, 2004). Accordingly, a strong need exists to study sectoral-level innovation to provide policymakers with knowledge regarding the current needs and challenges of a particular sector. This implies that a comprehensive national STI policy should take into account sector-specific needs of different sectors in the country.

In the same vein, numerous studies (e.g. European Comission, 2006; Hirsch-Kreinsen, 2008a, 2008b; von Tunzelmann and Acha, 2005) have suggested that STI policies can be more effective when they are based on a comprehensive understanding of both low-tech and high-tech industries. These studies, however, have also highlighted crucial issues for which low-tech industries have received little attention from policymakers and researchers compared to the more prestigious high-tech industries. In other words, policy has been biased toward science-based innovation and high-tech industries, with the low-tech industries receiving less explicit political attention and support (Hirsch-Kreinsen, 2008a, 2008b; von Tunzelmann and Acha, 2005). Likewise, findings from the Policy and Innovation in Low-tech (PILOT) project funded by the European Commission (2006) revealed that policymakers in the European Union and its member states are often advised to focus on high-tech manufacturing and high-tech services and not expend money, time, and attention on pre-21st century businesses, namely the low- and medium-low-tech industries.

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Thus, on the basis of efficient and sustainable STI policies to support innovativeness, these should be non-discriminatory and low-tech industries should be acknowledged as one of the important actors of a country’s innovation systems. The purpose of this paper is to investigate the dynamics of innovation, particularly in terms of actors and linkages in a low-tech industry – wooden furniture manufacturing – in the developing country of Malaysia. As such, this paper provides a long overdue rebalancing in the field of innovation research.

In general, furniture production forms part of the active downstream value chain activities of the larger wood-based product industry, which comprises sawm timber, panel products (including plywood and particleboard), moulding and joinery, and paper products. The furniture industry is a huge global business that has grown rapidly in the past three decades. According to Kaplinsky et al. (2003), trade in furniture worldwide in 2003 grew by 36%, which was faster than merchandise trade as a whole (26.5%), apparel (32%), and footwear (1%).

In the case of Malaysia, the furniture industry is largely wooden- and cane-based (Department of Statistics, 2009). Malaysia’s furniture exports have been on an upward trend since 2000. With remarkable expansion into overseas markets, Malaysia’s exports surged from MYR 317 million in 1990 to MYR 8.7 billion in 2008. In 2008, Malaysia was the 10th largest exporter of furniture; indeed, it was 3rd in Asia and 2nd amongst the Association of Southeast Asian Nations (ASEAN) (MPFC, 2009; MPC, 2009).

Overall, this paper contributes to both the literature and policy domains of innovation dynamics in low-tech industries. It provides ample empirical evidence of sectoral studies in the wooden furniture industry that eventually contributes to the comprehensive understanding of the innovation dynamics of the industry. Furthermore, Malaysia has long been recognised globally as one of the main furniture exporters; however, its achievements in this sector have not generated much interest from either policymakers or researchers in the country. Because it is categorised as a low-tech industry, it routinely receives less attention in national STI-related policies and action plans compared to high-tech and high-value industries such as information and communication technology, biotechnology, automotive, and aerospace.

A detailed analysis on Malaysia’s wooden furniture industry will help provide policymakers with options and information they need in terms of policy formulation. As STI policies and strategic thrusts have to be closely related in addressing issues and problems faced by the various actors operating within a sector, such sectoral studies will certainly provide valuable empirical evidence for formulating sound sector-specific STI development policies.

In order to achieve the objective of this paper, empirical evidence is derived from a case study of the wooden furniture industry in Malaysia. Malaysia’s furniture industry warrants an in-depth analysis as it is among the very few fully fledged, home-grown industries that has successfully penetrated the global market. This paper is structured as follows. Section 2 develops the theoretical background for the case study, and Section 3 describes the research methods used in this paper. Section 4 analyses the state-of-the-art of the wooden furniture industry in Malaysia. Section 5 lays the empirical foundation of the paper based on the information gained from the authors’ observations and intensive interview sessions with key players in the Muar furniture cluster in Malaysia. Finally, Section 6 draws conclusion and provides implication for policymakers.

2 OECD (2007) classifies the manufacturing industries into high-technology, medium-high-technology, medium low-technology, and low-technology groups, after ranking the industries according to their average 1991–99 aggregate OECD research and development (R&D) intensities. In this regard, the manufacture of furniture, which is under the class code 3610, has been classified as a low-tech industry (i.e., R&D intensity = 0.9).

2. Theoretical background

2.1. Sectoral Innovation Systems: actors and linkages

Like any other management practices, technological innovation is the subject of a considerable amount of research that crosses traditional disciplinary boundaries, including psychology, sociology, social anthropology, economics, economic history, engineering, geography, public policy, marketing, and corporate strategy (Grønhaug and Kaufmann, 1988). Such inter-disciplinarity, according to Betz (2003), is basically drawn from the nature of technological innovation, which bridges two very different worlds — the technical world that runs on the laws of nature, and the business world, which runs on the laws of the economy. In other words, technological innovation is by nature a highly socio-economic-technical hybrid. This is why according to Malecki (1997), the success of innovation no longer depends on individual investors, but on systematic laboratory research, an educated workforce, and knowledgeable managers who can integrate technology and the market in a complex combination. Additionally, changes that arise from technological change have been widely discussed using biological analogies. Similarities exist between the evolution of technological systems and the evolution of organisms that are heavily based on evolutionary theories. For Malecki (1997), the instability or disequilibrium and variability found in reality constitute strength of evolutionary theories. Furthermore, many consider Nelson and Winter (1982) to be the pioneers of the evolutionary theory-building movement in economic and technological development, particularly through their introduction of the term “routine”, or “all regular and predictable behaviour patterns of firms”. According to Malerba and Brusoni (2007), these routines are not fixed, but can change over time, especially under the influence of feedback from economic performance.

Theoretically, the frameworks of innovation systems, which are based extensively on evolutionary economics theorising and socio-technical change, are systemic views of the innovation process. They explicitly recognise the potentially complex interdependencies and possibilities for multiple kinds of interactions between various elements of the innovation process (Edquist and Hommen, 1999; Markard and Truffer, 2008). They can be generally defined as embracing all of the important economic, social, political, organisational, and other factors that influence how innovation develops, is distributed, and is used (Edquist, 1997). According to Nelson and Rosenberg (1993), the term “systems” in this concept is a set of institutional actors that together play the major role of influencing performance. In addition, according to Carlsson et al. (2002), systems consist of components, relationships, and attributes. Components are the operating parts of the system and can be a variety of types such as actors and organisations, physical or technological artefacts, and institutions in the form of legislative artefacts. Relationships are the link between components that involve market as well as non-market links. Attributes are the properties of the components and the relationships between them; essentially, they characterise the system. The dynamic properties of the system – robustness, flexibility, ability to generate change, and response to change in the environment – are among its most important attributes.

In terms of applying innovation system frameworks for innovation studies, these frameworks can be delimited in two different dimensions – spatially and sectorally – as well as according to the breadth of activities they consider (Johnson et al., 2003). The spatially delimited frameworks are the National Innovation Systems (Freeman, 1987; Lundvall, 1992; Nelson and Rosenberg, 1993) and Regional Innovation Systems (Cooke et al., 1997). Meanwhile, the sectorally delimited frameworks are classified as Sectoral Innovation Systems (Breschi and Malerba, 1997; Malerba, 2002) and Technological Systems (Carlsson, 1997).

In this paper, we focus on Sectoral Innovation Systems; that is, innovation and technology change show different rates, types, and trajectories

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depending on the sector in which they take place (Malerba, 2002). The notion of Sectoral Innovation Systems complements other concepts within the innovation systems literature (Edquist, 1997). For Malerba (2005), a sector is a set of activities that are unified by some linked product groups for a given or emerging demand and that share some common knowledge. Firms in a sector have some commonalities, but at the same time are heterogeneous.

Multidimensional, integrated, and dynamic views are the main concepts of Sectoral Innovation Systems. According to Malerba (2005), understanding the key driving sectors of an economy with their specificities greatly helps in understanding national growth and national patterns of innovative activities. Again, Malerba (2004) emphasised that a sector is composed of heterogeneous agents, including organisations or individuals (e.g., consumers, entrepreneurs, scientists). Organisations may be firms (e.g., users, producers, input suppliers) or non-firms (e.g., universities, financial institutions, government agencies, trade unions, or technical associations), and include subunits of larger organisations (e.g., R&D or production departments) and groups of associations (e.g., industry associations). Firms are the key actors in generating, adopting, and using new technologies and are characterised by specific beliefs, expectations, goals, competences, and organisations that continuously engage in the processes of learning and accumulating knowledge (Malerba, 2002, 2004; Nelson and Winter, 1982). Other types of agents in sectoral systems are non-firm organisations such as universities, financial organisations, government agencies, and local authorities. In various ways, these groups support firms in producing products, innovating, and diffusing technology. Again, their role greatly differs among sectoral systems. Agents are characterised by specific learning processes, competencies, beliefs, objectives, organisational structures, and behaviours, which interact through the processes of communication, exchange, cooperation, competition, and command. Thus, in a sectoral systems framework, innovation is considered a process that involves systematic interactions among a variety of actors to generate and exchange knowledge relevant to innovation and its commercialisation (Malerba, 2004).

Within sectoral systems, heterogeneous agents are connected in various ways through market and non-market relationships. According to Malerba (2004), the different types of relations can be identified and linked to three different analytical cuts as follows. First, traditional analyses of industrial organisations have examined agents as involved in processes of exchange, competitions, and command, such as vertical integration. Second, more recent analyses, has examined the processes of formal cooperation or informal interaction among firms or among firms and non-firm organisations in depth. Prior studies have analysed firms with a particular market power, suppliers or users facing opportunistic behaviour or asset specificities in transactions, and firms with similar knowledge having appropriate and indivisibility problems in R&D. Third, the evolutionary approach and innovation systems literature have also paid significant attention to a range of formal and informal cooperation and interaction among firms.

2.2. Low-tech industries and innovation patterns

A noteworthy feature of the modern economy is that many kinds of low-technology and labour-intensive industries have emerged as engines of growth. The furniture industry, together with clothing and footwear industries are among these sectors. These industries are often marked by low wages, unskilled workers, and sweatshop employment conditions. They also provide employment opportunities and target fashion-oriented segments (Scott, 2006). For Malerba and Orsenigo (1997), differences in the structure of innovative activities may be related to a fundamental distinction between Schumpeter’s Mark I and Mark II technologies. The pattern of innovation activity for Schumpeter’s Mark I is characterised by “creative destruction,” lead by technological ease of entry and entrepreneurs and new firms playing a major role in innovative activities. On the other hand, Schumpeter’s Mark II theory suggested that the pattern of innovative activities is characterised by “creative accumulation,” with the prevalence of large, established firms and the presence of relevant barriers challenging the entry of new innovators. In the case of the furniture industry, a cross-country comparison of Schumpeterian patterns of innovation by Malerba and Orsenigo (1997) in Germany, France, the UK, Italy, Japan, and the US showed that the furniture industry consistently falls within the Schumpeter’s Mark I camp. In other words, the pattern of innovation activity in the furniture industry is generated mainly through entrepreneurial activity and the creativity of small and new firms.

Pavitt’s (1984) pioneering work suggested that sectoral patterns of technical change can be addressed in three categories, namely supplier-dominated, production-intensive (i.e., scale intensive and specialised suppliers), and science-based. These trajectories can be explained, in turn, by sectoral differences among three characteristcs; namely, sources of technology, users’ needs, and means of appropriating benefits. The wood sector, together with textiles, lumber, paper, mill products, printing and publishing, and construction are classified as supplier-dominated sectors. Most innovation comes from firms that supply equipment and materials, although in some cases large customers and government-financed research and extension services also contribute. A relatively high proportion of innovative activities in these sectors are directed toward process innovation. According to Vega-Jurado et al. (2009), technological knowledge in supplier-dominated sectors is embodied mainly in the machinery, equipment, and capital assets that other sectors produce. de Jong and Marsili (2006) proposed a more diverse pattern of innovation within small firms than did Pavitt’s taxonomy. They indicated that innovations among supplier-dominated firms are low in all dimensions; that is, in forms of input (financial, time, and employment), in formal planning, and in management attitude. Innovation mainly consists of process innovation as manufacturers essentially spend their time responding to suppliers’ proposals.

In brief, the sectoral patterns of the wooden furniture industry have been consistently postulated as low-tech, labour-intensive, and supplier-dominated. The roles played by those in the immediate business environment such as suppliers, customers, competitors, and retailers are crucial. As Woolgar et al. (1998) emphasised in their so-called SME-centric universe framework, small firms interact most often and most closely within their immediate business environment. They are linked closely to their immediate business environment players, including customers, machinery and material suppliers, retailers and exporters, and other support industries. Universities and government organisations lie outside the small firm’s frame of reference. Based on this backdrop, this paper’s main objective was to study the significant roles various innovation actors play and their links to the process of technological innovations in the wooden furniture industry. This study’s empirical evidence is derived from a narrative case study of the Muar furniture cluster in Malaysia.

Overall, literature on sectoral-level innovation studies has shown that low-tech industries are still relevant sources of innovation in the economy. Despite playing prominent roles in growth and generating employment (European Comission, 2006), the capability of low-tech industries to advance and use new technologies should not be underestimated (Cox et al., 2002; Hirsch-Kreinsen, 2008a,
2.3. Spatial agglomeration and the dynamics of innovation

In addition to the literature within Sectoral Innovation Systems and the patterns of low-tech innovation patterns, another stream of literature that sheds some light on the empirical studies of innovation patterns in the wooden furniture industry is the spatial agglomeration dynamics of industrial activities. According to Asheim and Coenen (2005), the spatial agglomeration perspective, which is founded on the concept of cluster and Regional Innovation Systems, belongs to the family of territorial innovation theories, which have demonstrated particular resonance in academic and policy circles. For Scott (2006), the global landscape of furniture production is marked by enormous diversity from place to place, but is nonetheless organised around the great agglomerations that constitute the main developmental poles of the industry. In general, these agglomerations function as spatial anchors for a series of international trading flows, which includes direct exports of final products, intra-firm trade, and outsourcing relationships. In the same vein, Beerepoot (2004) believed that operating in a cluster provides companies with the opportunity to monitor the work of similar firms and combine such observations with their own efforts.

Evidence from prior empirical studies has suggested that generally not much difference exists between the furniture manufacturing activities of clusters within developed and developing countries. The Italian furniture industry, however, is an exception. Compared to other furniture clusters, which are mostly Original Equipment Manufacturer (OEM) based, Italian firms typically are design-oriented, which aim at strong product uniqueness and new design forms (Lindman et al., 2008). The importance of linkages, especially the role of subcontracting in fostering the technological and skill capabilities of the furniture industries have been addressed in almost all the studies. For instance, studies have investigated the importance of external connections in stimulating internal innovation in Canadian furniture clusters (Drayse, 2011): vertical and horizontal networks as the primary sources of innovation in furniture clusters in Denmark (Asheim and Coenen, 2005); subcontracting relationships with foreign investors and buyers, as well as agglomeration economies in Indonesian furniture clusters (Berry et al., 2002).

2.4. Summary

Overall, the theoretical basis for this paper draws on three streams of literature: namely, Sectoral Innovation Systems, low-tech innovation patterns, and the dynamics of spatial agglomeration innovations. The framework of Sectoral Innovation Systems rests on the premise that understanding and mastering links among actors involved in innovation is a key to improving innovation performance at the sectoral level. These actors consist of heterogeneous innovation agents that are either organisations or individuals. Links among these actors, either in the form of market or non-market relationships, are prime contributors to innovation capacity. On the other hand, the literature on low-tech innovation patterns provides extensive empirical evidence on the patterns of innovation in the furniture industry — a low-tech industry. The study of innovation in the context of the furniture industry relates to the entrepreneurial activity and creativity of small and new firms. The furniture industry is mostly supplier-dominated sectors in which most innovations are derived from equipment and material suppliers. As a complement, the literature on spatial agglomeration sheds some light on the territorial nature of the industry. The dynamics of innovation in spatial agglomerations is characterised as a series of international trading flows, which include direct exports of final products, intra-firm trade, and outsourcing relationships.

3. Research method

This study is mainly exploratory with interest in identifying the innovation actors and their linkages in a low-tech industry; that is, wooden furniture manufacturing in Malaysia. The study employed a qualitative research approach and an in-depth case study method. Various scholars (e.g., Hakim, 2000; Sekaran, 2003; Yin, 2003) have discussed the validity of case studies. According to Hakim (2000), a case study can provide a richly detailed ‘portrait’ of a particular phenomenon. For Yin (2003), the case study research method is an empirical inquiry that investigates a contemporary phenomenon within its real-life context. In the same vein, Sekaran (2003) believed that qualitative case studies are useful in applying solutions to current problems based on past problem-solving experiences. Case studies are also useful in understanding certain phenomena and generating additional theories for empirical testing.

The qualitative data for this study were obtained through secondary resources and observation during the site visits. Most importantly, data was obtained from in-depth interviews with senior representatives from the main innovation actors that played significant roles in developing the Muar furniture industry located in the Muar District in Johor State, Malaysia. These actors are representatives from both the small and medium enterprises (SMES) and large-scale furniture manufacturers, representatives from the Muan Furniture Association (MFA), Muar Municipal Council (MMP), Malaysian Furniture Promotion Council (MPC), and Forest Research Institute Malaysia (FRIM), as well as industrial training institutes and schools. Twenty interviews were carried out by this paper’s first author between April and August 2010. Interviewees were assured that their identities would be kept confidential.

The interview sessions followed a pre-designed interview protocol. First, the interviewees were provided with a brief description of the research. This was followed by questions regarding: (1) the success factors of the Muar furniture industry, (2) the significance and roles of various actors, (3) the characteristics and level of links among these actors, (4) issues related to innovation capacity development, and (5) the effectiveness of existing STI policies and programmes.
4. Malaysia’s wooden furniture industry

4.1. Industry structure, development, market and location

In Malaysia, furniture intended for export is often made in “Ready-to-Assemble” or “Knock-Down” mode. The major types of furniture exports are kitchen furniture, bedroom sets, upholstered furniture, and wooden office furniture. In 2008, wooden furniture accounted for about 79.4% of Malaysia’s furniture exports to overseas markets, and it contributed to 30.3% of the total export value of the timber industry (MFPC, 2009; MITI, 2006). Malaysia’s furniture exports have been on the upward trend since the year 2000. With remarkable expansion into the overseas market, exports surged from MYR 317 million in 1990 to MYR 8.7 billion in 2008 (MPFC, 2009; MPIC, 2009).

The 1980s was an era of impressive growth for the country’s furniture industry due to several factors. First, the country experienced a drastic change in the raw material for furniture production from tropical timbers such as meranti, nyatoh, and sepert to rubberwood (Heveabrasiliensis) (FDM Asia, 2000; JETRO, 1999; MTC, 1998; MTQ, 1999). Rubberwood has proven to be a versatile, affordable, and well-accepted raw material for producing furniture. Rubberwood also has strong machining properties such as sawing, planing, drilling, gluing, and sanding. It has a light colour and can be altered to resemble other types of wood. The advent of rubberwood as a raw material is an advantage to Malaysia because rubberwood is abundantly available in the country. Today, about 80% of the furniture exports are manufactured from Malaysian rubberwood. The second factor is the availability of a pool of a low-cost, skilled workforce. This has enabled Malaysia to tap the shift in comparative advantage from traditional exporters such as Taiwan, which began to experience higher production costs due to increased labour and foreign exchange movements (MTC, 1998).

The Malaysian furniture industry is highly fragmented, and the predominance of SMEs in the industry is significant. Today, SMEs constitute almost 95% of the total establishments in the Malaysia’s furniture industry. From the perspective of the industry’s performance, however, both SMEs and large enterprises produce an equal share in terms of gross output value, value added, employment, salary and wages, and value of assets (Department of Statistics, 2009). It is also important to note that the wood-based industry differs conspicuously from other industries in Malaysia. It is largely domestically owned and shares the centre stage within the SMEs category (Tan, 2000). The majority of furniture manufacturers are located on non-industrial land, which are close to where the manufacturers’ private residences. This occurs because less capital is required if production is located on personally owned premises. High density population areas and the availability of raw materials are also factors that influence the concentration of furniture manufacturers (JETRO, 1999). Most of the furniture mills are concentrated along the coast of the central region, in the northern states, and the Muar District in Johor State in Peninsular Malaysia. Today, three major furniture clusters exist in Malaysia; namely, Muar in Johor State, Klang Valley, and Penang–South Kedah Clusters. The Muar furniture cluster is mainly wooden based, whereas the Klang Valley and Penang–South Kedah Clusters are mainly metal and mixed furniture, respectively.

4.2. Technological capabilities

A landmark report by MTC (1998) revealed that the level of technology the Malaysian furniture industry employs is on par with other furniture manufacturing countries, if not higher. Indeed, most of the country’s furniture manufacturers have made considerable investments in machinery and equipment. Such investments may not be impressive by the standards of other high-tech industries, such as the electronics sector, but the amount invested nevertheless indicates that the industry has advanced beyond being the traditional wood-working mills and carpentry shops. The National Technology Mapping Programme II on Malaysia’s wood-based industry has benchmarked the furniture industry against international standards. The result shows that the furniture industry is competitive internationally in terms of recovery rate, product reject rate, profit rate, and models. The performance of the furniture industry in terms of R&D budgets, labour productivity, and labour turnover, however, is considered unsatisfactory compared to international standards (EPU, 2002).

More than 95% of the machines the industry uses are imported, and the local fabrication of machines is only at the finishing stage. In the same vein, Ratnasingam (2005) stated that 36% of the technology for the furniture industry is sourced from Taiwan, 28% from Italy, 19% from Germany, and the remaining 17% from other countries. Furthermore, locally modified machines such as presses, tables saws, bench drills, band saws, and jump saws are also used.

In general, most of the machinery purchased is special-function machinery, which aims to reduce the labour content in the manufacturing outfit, with the ultimate aim of reducing manufacturing costs or unit cost. This is to be expected because the industry is labour intensive in nature and relies increasingly on foreign-contract workers within the industry (Ratnasingam, 2005). The status of machines and technology of the furniture industry is summarised as follows (JETRO, 1999):

- **Level of technology.** The level of technology used is medium, with exceptions depending on the furniture type produced. Approximately 60% of furniture manufacturers still use manual machines due to its ease of operation and the fact that it does not require skilled workers.
- **Modification of technology.** The modification of machinery is at the lower end of the machinery technology. This is because there are no specific R&D activities in the area of technology modification and machines process studies. The normal modified machinery used in Malaysia is press assembly, cold press, table saw, jump saw, drill press, and finishing systems.
- **Machines and technology acquired through transfer technology.** Because there are no specific institutions in Malaysia that carry out R&D activities in the field of wood working technology, there is no ‘real’ party that can be given the task of adopting the imported technology. The government is very supportive of importing high-tech machinery, and the industry is given incentives such as no sales tax is imposed on high-tech machines.

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5 Another advantage of rubberwood is that as a plantation wood it can be categorised as environmentally friendly in terms of sustainability. Based on the prospects of Malaysia’s furniture industry in an environment of intense global competition, it is to the country’s advantage that it has adhered to international rules and agreements on tropical timber MTQ, 1999. Malaysia’s Furniture Industry: Its Prowess and Promise, Malaysia Trade Quarterly. Malaysia External Trade Development Corporation, Malaysia, pp. 45–47, 50–52.

6 The standard definitions for SMEs in Malaysia are based on two criteria; namely, the number of full-time employees and annual sales turnover of the enterprises. On 9 June 2005, Malaysia’s National SME Development Council approved for adoption the following definition of Malaysian SME in manufacturing sectors: (a) micro-enterprise: sales turnover of less than MYR 250,000 or full-time employees less than 5; (b) small-enterprise: sales turnover between MYR 250,000 and less than MYR 10 million or full-time employees between 5 and 50; and (c) medium-enterprise: sales turnover between MYR 10 million and MYR 25 million or full-time employees between 51 and 150.

7 Examples can be found in some furniture village or cluster such as in Kampung Baru, Sungai Buloh, and Muar where a competitive infrastructure and accessible roads are lacking, but manufacturers are able to operate productively.

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• Furniture testing. FRIM is currently the sole furniture-testing laboratory in Malaysia. Tests are based on Malaysia Standard, British Standard, International Organisation for Standardisation (ISO) and other related standards. Performance testing includes tests such as static tests, impact tests, and stability tests. Local manufacturers are becoming increasingly aware of the quality of their products, but they usually only test products involved in big contract projects. Many do not test products for the general consumer market.

4.3. Technology and innovation based development policies

Malaysia’s wood industry is a mature industry, but its operational strategies are in their infancy (Ratnasingam, 2000). Since 1996, through strategies under the Second Industrial Master Plan (1996–2005), the government has introduced the cluster-based approach for developing the industry along with other industrial clusters. The cluster-based approach emphasises the growth of the manufacturing sector and associated growth in supporting industries, which incorporates the services sector (MITI, 1996). In conjunction with this approach, the government has implemented the Industrial Linkages Programme to integrate SMEs into the mainstream of the manufacturing sector (Mohd Khairuddin Hashim, 2002). Formulating cluster-based policy emphasises the strength of the supporting industries and institutions and the links between supporting and leading industries. The furniture cluster identified under this policy is the wooden furniture industry situated in Muar. These cluster-based efforts have been extended to the Third Industrial Master Plan (2006–2020), where significant emphasis will be placed on the integrated approach toward industrial development (MITI, 2006). In line with this strategy, establishing the Malaysian Rubberwood Furniture Industrial Park has been proposed in the Eastern Corridor Economic Region (MPIC, 2009).10 Ismailah Ahmad et al. (2003) claimed that one of the key reasons for the impressive growth and development of the wooden furniture industry in Malaysia is that they have been supported heavily by the government through policies and programmes as provided in the Industrial Master Plans (IMPs). The industry is both heavily protected and enjoys several investment incentives.

Key strategies Malaysia has employed in developing a cluster furniture industry are summarised in Table 1.

4.4. Summary

Malaysia’s wooden furniture industry has enjoyed impressive growth during the last three decades. As a downstream manufacturing industry, wooden furniture manufacturing has contributed significantly to the total export value of the country. The nature of Malaysia’s wooden furniture industry – low-tech, labour-intensive, SME-driven, and resource-based – agree with the premises postulated by Hirsch-Kreinsen (2008a, 2008b), Malerba and Orsenigo (1997), and Pavitt (1984). The industry also exhibits spatial agglomeration development in Malaysia, in which most of the industrial districts are concentrated along the coast of the central region, the northern states, and the Muar District in Johor State in Peninsular Malaysia. Different industrial districts show their own dynamics. In this context, the Muar furniture cluster is mainly wooden based, whereas the Klang Valley (central region) and Penang–South Kedah (northern states) districts are mainly metal and mixed furniture clusters, respectively. This provides fruitful evidence that furniture production is marked by enormous diversity from place to place as Scott (2006) suggested. In respect to formulating and implementing STI development policies, there is also a clear exhibition in Malaysia that the regional innovation and cluster-oriented approaches have been adopted to develop the industry.

5. The furniture capital of Malaysia: Muar

5.1. Background of Muar District

The Muar District is located in the north-western region of Johor state, Malaysia and is known as the furniture capital of Malaysia. It borders Malacca state to the north, Segamat District to the east, and Batu Pahat District to the south. Muar town, also referred to as Bandar Maharani (or the Empress Town) is the most important commercial and administrative centre in Muar District. It is 150 km southwest to the Malaysian capital, Kuala Lumpur, and 180 km northwest of Singapore. The administrative system of Muar District, as other district-level administrations in the country, is described in the Muar District

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Table 1

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<tr>
<th>IMPs and period</th>
<th>Development strategies</th>
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<tr>
<td>Medium- and Long-term Industrial Master Plan (1986–1995)</td>
<td>Establish a furniture complex. The idea of a furniture complex is to create a viable manufacturing activity mass composed of multiple producing units in a relatively close area with common facilities used on a shared basis. The furniture complex should provide common service facilities such as kiln dry, treatment plant, tools and parts maintenance workshop, training workshop, sales display centre, testing and quality control laboratory, and warehouse services.</td>
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<tr>
<td>2nd IMP (1996–2005)</td>
<td>Cluster approach towards industrial development. The cluster-based industrial development approaches of the 2nd IMP will not only emphasise the growth of the manufacturing sector, but, more importantly, the concomitant growth of the supporting industries, which incorporate the service sector. A cluster is an agglomeration of inter-linked or related activities comprising industries, suppliers, critical supporting business services, requisite infrastructure, and institutions. Establishing furniture parks. To promote the industry, facilities have been established in various states: Five Furniture Industrial Parks have been established by the Ministry of Plantation Industries and Commodities in collaboration with the State Governments of Terengganu, Pahang, Perak, Selangor and Kedah, to develop SMEs in the industry. Also, one furniture finishing centre was established in an existing project in Melaka. Measures will be introduced to encourage the industry shift</td>
</tr>
<tr>
<td>3rd IMP (2006–2020)</td>
<td></td>
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9 The Industrial Linkages Programme is aimed at developing Malaysian SMEs into competitive manufacturers and suppliers of parts and components and related services to multinational corporations and large companies. To encourage firms to participate in the Industrial Linkages Programme, Pioneer Status with tax exemption of 100% on statutory income for 5 years or Investment Tax Allowance of 60% on qualifying capital expenditure incurred within a 5-year period are provided to eligible SMEs. For multinational corporations or large companies, expenses incurred in developing SMEs, including training, factory auditing, and technical assistance to ensure the quality of vendors’ products, will be allowed as deductions in computing income tax.

10 The Eastern Corridor Economic Region covers 66,736 km² of land (the states of Kelantan, Terengganu, Pahang, and the district of Mersing in Johor), which represents 51% of Peninsular Malaysia. The objective of this 12-year master plan (until 2020) is to narrow the development disparities among states in Malaysia. Under this master plan, rubber estates of up to 100,000 ha are to be established, where rubberwood will be grown and harvested for timber. This, in turn, will enable furniture factories to be established in the region because rubberwood will be readily available.
Local Plan 2002–2015. According to MPM (2002), 70.54% of land use in the Muar District is for agricultural activities. Of this, 21.33% is set aside for rubber plantations, which is the main source of wood for the furniture industry. Only 0.34% of the land is used for industrial activities. However, this figure doesn’t capture the true picture of land use for industrial activities because most of the firms, especially the small- and micro-sized enterprises are operating on agricultural and residential land. Fig. 1 shows Muar’s geographical location.

5.2. Current structure and characteristics of the cluster

Presently, many of the furniture manufacturing enterprises are under the stewardship of second-generation entrepreneurs. Approximately 300–350 furniture manufacturers are located in the Muar District (MFA, 2008). The local Chinese community owns the majority of these furniture firms, with SMEs being the main pillar of the Muar furniture industry. Unpublished statistics by the Department of Statistics show that almost 94.5% of investments in the industry are local investments and almost 80% of the enterprises are classified as small- and medium-sized businesses.

Products are in the form of finished furniture, semi-finished furniture, or parts. The market for these firm’s products is both local and international. There are currently seven large furniture enterprises or consortiums listed in the Malaysian Stock Exchange. In contrast, there are few micro-sized furniture enterprises. Such businesses are not able to survive because they are unable to cope with the intense market competition. Another important observation is that there is no transnational corporation in the Muar furniture cluster.

In general, the structure of the cluster is a simple, single layer where a wooden component and parts supplier services a single OEM. Many of the component parts suppliers are ex-employees of the larger companies that retain a considerable amount of trust and loyalty. Most of the machines are imported from low-cost suppliers such as China and Taiwan. Overall, the cluster is rather immature and needs to be developed. This is in contrast to the more complex vertically and horizontally integrated clusters in Italy and Taiwan. Other main characteristics of the Muar furniture cluster include:

- Types of wooden furniture. Solid rubberwood is the main raw material for the furniture manufacturers, with most targeted for the export market. Various types of furniture are manufactured within the cluster, including dining and bedroom sets, sofa sets, office furniture, chairs, and tables. Dining sets, chairs and tables are more compact in their knock down form in relation to value and are hence less expensive to transport in containers.

- Raw materials. The most important consideration for furniture makers is the availability and quality of resources and raw materials. The total demand for rubberwood by the Muar furniture manufacturers is approximately 1 million cubic metres, which is about 60% of the total requirement for the whole of Johor state. The estimated requirement for sawn timber in Muar in 2008 was 80,000 m³/month. Rubberwood furniture is a strong area for Malaysia, because they have the advantage of a constant supply of raw materials. Rubberwood prices, however, have increased due to reduced land area devoted to rubber plantations due to rapid conversion to palm oil. Johor is able to supply only about 30% of the requirements. At the moment, the government is encouraging sourcing raw materials from other ASEAN countries. Furthermore, the Johor state government has embarked on a large-scale programme to develop rubber forest plantations in the state.

- Technology. The machinery used is generally up-to-date and on par with the standard technology being used elsewhere in the world. Automation, however, is rather limited compared to the industry in Italy or Taiwan.

- Training. Almost all the training carried out is in-house, on-the-job training. Some management staff appears to have had experience and training in Taiwan.

- Employment. The number of people employed directly is 15,000. For the cluster as a whole, the total number can be up to 25,000. The majority (about 60%) of employees are foreign labour from Nepal, Myanmar, and Bangladesh.

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11 In general, the administrative system of Malaysia’s spatial and physical is tiered, consisting of the federal government, the state governments, and local authorities (such as city, municipal, and district councils). At the national level, the National Physical Plan (RFN) is prepared by the Town and Country Planning Department based on the requirement of the Town and Country Planning Act 1976 (A1129). It contains a written statement that formulates strategic policies in determining the general directions and trends of the country’s physical development and is to be accompanied by indicative plans. At the state level, the State Structure Plan (RSN) is prepared by the State Department of Town and Country Planning to establish the policies and proposals for developing and using the land in a state based on policies and directions stated in RFN. The local authorities prepare the District Local Plan (RT). RT controls the development at the local level and details the land-use plan that incorporates the national and the state development policy.
5.3. Success factors

It is widely believed that the success of the Muar furniture cluster is based on favourable timing, geographic location, and support of the people. In other words, the industry was in the “right time, right place, and right people” as follows:

- **Timing.** While some of the major furniture exporters (for example Taiwan) were looking for a new production base, the emergence of Muar with a pool of skilful workforce, low production costs, and abundance of solid wood was opportune. At the same time, Malaysian rubberwood proved to be a versatile, affordable, and well-accepted raw material for furniture production. The advent of rubberwood as a raw material is a significant advantage because it is abundantly available in Muar and the neighbouring districts. Rubberwood particleboard’s selling points compared to solid timber are its low cost, its availability in large flat sheets, and its ability to be decorated with melamine-based overlays.

- **Geographical location.** Muar is close to rubberwood resources such as the districts of Segamat and Batu Pahat, the state of Malacca, and Negeri Sembilan. Furthermore, Muar is close to Johor Port and Singapore, which is the regional centre for machinery and hardware supplies.

- **People.** Because Muar is a relatively small town, the relationship among the community (and the industry players) is favourable. Mutual understanding exists among competitors to see one another as partners on their way to advancing to greater heights in the international arena. The achievement of the Muar furniture cluster is built upon the collective efforts of the industry players, which are prepared to share business opportunities and information.

Over the years, the government has established numerous furniture villages such as those in Olaklempt and Ulu Yam in Selangor State; Setiu in Terengganu State; Senawang in Negeri Sembilan State; Kuantan and Temerloh in Pahang State; Bukit Selambau in Kedah State; and MukimBlanja in Perak State, as well as numerous others in various stages of development. These villages are part of the government’s effort to locate furniture manufacturers in a single designated area. A furniture village provides basic facilities such as roads, electricity, water, a preservation plan, kiln drying, raw material storage, transport, among other services. These furniture villages, however, which are “policy driven” clusters, have not been successful when compared to the furniture cluster in Muar. They have also failed to achieve their stated objectives. Because these furniture villages were developed by government agencies, they are less commercially oriented and lack a sense of urgency. Muar, in contrast, is a different type of cluster that has been driven by business. It evolved naturally without much government intervention. Essentially, it has developed because of its own dynamics.

Muar has developed gradually to become not only a centre for mass producing furniture, but also the focus for all kinds of support industries related to furniture making, such as materials and machinery suppliers. Moreover, it is easy to find skilled workers in Muar, and the prices of Muar furniture are attractive due to open competition among manufacturers. Furthermore, because Muar is a small town, the relationship among the residents is generally close. These aspects, which have underpinned the success of the Muar furniture industry, cannot be found in the government-promoted furniture villages.

5.4. Actors

As stressed by the Sectoral Innovation Systems, a sector is composed of heterogeneous agents including organisations or individuals. A similar composition of actors is reflected in the Muar furniture industry. The achievements of the Muar furniture industry are the result of successful collaborations among various industry players. Its advantages lie in the abundance of quality materials, stringent quality control, and on-time delivery, which are supported by the collective efforts of the entire furniture industry. Much like any other industry cluster or innovation system, the relevant actors work collaboratively to sustain the cluster. Such actors include the supporting industries, machinery and equipment suppliers, government services and municipalities, transport and logistics, training and research institutions, financial institutions, wood materials suppliers, and retailers and exporters. These are described as follows:

- **Furniture manufacturers.** As noted, the majority of the manufacturers are locally owned SMEs. Due to the intense competitive market, only a few micro-sized manufacturers survive. There are, however, currently seven publicly listed enterprises or consortiums in Muar. These main anchors of the industry are able to secure large orders from overseas buyers. The SMEs are also able to secure orders from foreign retailers or function as parts and components suppliers to the large enterprises through subcontracting projects.

- **Furniture support industries.** The wooden furniture industry in Muar is supported by an array of supporting industries, including coating, varnishing, finishers, fabrics, foams, adhesives, glass and mirror, and wood products (wood dowel, round rod, etc.). Coating is one of the crucial parts of furniture making. Mixing the colour pigment is an extremely complicated task because it requires taking into account the quality of paint and the structure of the wood.

- **Machinery and equipment suppliers.** Numerous machinery and equipment suppliers operate in Muar. These companies supply a range of imported, new, or reconditioned wood working machines and tools from China, Taiwan, Italy, and Germany. The machines commonly supplied include the finishing line system (tow line conveyor system, pallet conveyor system, overhead conveyor system, and auto electrostatic coating system), dust extraction system (dust collector system and dust filter), and wood working machines (high speed moulder, multiple spindle, moulding edge sending machine, and rip saw machine).

- **Retailers and exporters.** Most of the furniture enterprises are still classified as OEMs; they supply finished products or semi-finished furniture to their buyers, which are mostly overseas retailers. These retailers are either large, multi-store retailers such as IKEA or small-scale retailers. Some of the Muar furniture enterprises, particularly those that are large and medium-sized, have formed subsidiaries in order to market their products.

- **Wood materials suppliers.** Because the furniture industry in Muar is primarily wood based, it depends heavily on the availability of rubberwood logs. Most of the rubberwood in Muar is secured from its neighbouring districts (such as Segamat and BatuPahat) or states (such as Malacca, Negeri Sembilan, Pahang, and Kelantan). The main wood materials used are high- and medium-density fibreboard, particle broad, veneer, and plywood.

- **Government services and municipalities.** The Muar furniture industry works closely with the MFPC, which was established in 2003. The MFPC carries out programmes that include promoting and developing new markets, enhancing design capabilities and capacities, and collecting and disseminating market information and trade statistics to the industry. The Malaysian Timber Industry Board (MTIB), a statutory body accredited to the Ministry of Plantation Industries and Commodities (MPIC) established in 1973 by an Act of Parliament, promotes and coordinates the overall development of the timber industry. One of MTIB’s programmes that directly benefits the Muar furniture industry is the establishment of the Furniture Resources Centre, located in the Wood Industry Skills Development Centre (WISDEC). The centre allows the industry to obtain updates on the latest developments in furniture design and manufacturing. Furthermore, to maintain and improve the quality of Malaysia’s furniture products, the Furniture Testing Laboratory (FTL) was established under FRIM to provide standard test services to the furniture manufacturers.
The national policy directions of the furniture industry are set out in the National Timber Industry Policy (NATIP) 2009–2020 by MFPC and MTIB. NATIP will guide stakeholders and industry players on developing trends that are most feasible for the industry. At the state level, the state government of Johor is important in planning and monitoring the spatial and physical development for the Muar furniture industry, especially in allocating land for industrial purposes and providing basic infrastructure such as road access to the industry. In this regard, the State Department of Town and Country Planning is responsible for drawing up the State Structure Plan, which governs the development and use of land in a state. The local authority, the Muar Municipal Council, prepares the District Local Plan to control and monitor development at the local level and detail the land-use plan, which incorporates national and state development policies. The Muar furniture industry works closely with the Muar Municipal Council to solve problems related to industrial land, illegal factories, foreign workers, and environmental issues. Recently, the State Government of Johor approved the Muar Furniture City Project, a permanent exhibition for the industry, which is located in Tangkak.

• **Industry association.** The MFA, established in 1982, currently has about 300 members and is the largest furniture association in Malaysia. The MFA helps unite the manufacturers and acts as an arbitrator when disputes arise. It was particularly active during the early days when too many newcomers were crowding the industry. Realising the importance of exhibitions and trade fairs, the MFA has organised many furniture exhibitions such as the Export Furniture Exhibition, Johor Furniture Exhibition, and Muar Furniture Export Exhibition. These exhibitions have attracted many overseas buyers and helped the industry penetrate the international market. The MFA also represents the Muar furniture industry in dealing with the government and local authorities regarding certain issues such as foreign workers policy and land for industrial use.

• **Training and research institutions.** Numerous institutions provide training and research facilities to the furniture industry. These institutions are formal school and vocational centres, institutes of higher learning, government agencies, furniture associations and companies, and professional and private institutions. Table 2 lists the training centres for the industry in Malaysia.

• **Financial institutions.** Most of the commercial banks in Malaysia have regional branches in Muar. They provide the furniture manufacturers with loans for business development. In general, the regional branch managers have confidence in the Muar furniture entrepreneurs, because most of them have a clean record with the banks.

5.5. **Linkages**

Both technological products and innovations are complex, interactive, and continuous processes that involve a series of alternating stimulus–response exchanges among the prominent actors in the system. A reasonably sound link between the firms and various innovation actors such as customers, suppliers, competitors, government machinery, research laboratories, and financial institutions is crucial to determining the overall performance of a firm’s innovation capabilities. In the case of the Muar furniture industry, the links play a crucial role in establishing cooperation and partnership with alliance parties, sourcing external knowledge and information, and securing funding for technological innovation.

Fig. 2 depicts the linkages between the Muar furniture manufacturers with selected key innovation actors. The furniture manufacturers, both SMEs and large enterprises, are at the centre of the network universe. Manufacturers are linked closely to their immediate business environment such as customers, machinery and material suppliers, retailers and exporters, and supporting industries. The outer layer of the figure captures the links between the furniture manufacturers and other innovation actors, including industry associations, government services and municipalities, financial institutions, and training and research institutions. While some of the actors have established a close relationship with the manufacturers, others lie outside the manufacturers’ purview.

The relationship between the SMEs and large Muar furniture manufacturers is symbiotic and mutually beneficial. Through subcontracting arrangements, the large enterprises rely on the SMEs for parts, components, and semi-finished furniture. For the SMEs, establishing a close relationship with the large enterprises enables them to survive in the competitive market. In fact, one of the dominant assets of the furniture industry in Muar is its social capital in the form of cooperative spirit, trust, and loyalty among the industry practitioners. The manufacturers have no issues with sharing their knowledge, technical know-how, and even business opportunities with others. This is mainly because Muar is a small town and most of the manufacturers have been there for generations. They know one another, and their trustworthiness is high. All the furniture manufacturers, regardless of whether they are large or SMEs work collectively for the industry’s success.

As predicted, the furniture manufacturers form a close partnership with their immediate business environment, including suppliers, customers, retailers, and support industries. The suppliers provide what is needed in the furniture manufacturing process, such as machinery and equipment and wooden materials. Retailers are crucial for marketing purposes, whereas the customers are the product recipients of the furniture manufacturers. Supporting industries such as fabrics, painting, vanishings, finishers, foams, and adhesives provide support in terms of adding value to the value chain of the furniture manufacturing. All these four pillars of the immediate business environment are crucial. The absence of any party will lead to the industry’s failure.

In terms of the industry association, the linkage with the MFA is most significant. Through the MFA, the manufacturers have worked with industry associations and organisations from other countries to develop the local industry. Exchange programmes and interaction promote advancement in management skills, technology, as well as design, and have helped the industry become more competitive. For instance,
in 2001, the MFA worked with the German Furniture Dealers Association to discuss the development of the industry in terms of product design, sales trends, and trading information. In 2003, it saw the association interacting with Ghana authorities to promote bilateral trading. And, in 2005, the MFA sent a delegation to Western China to study the development of the furniture industry. The association hopes to promote more of these international exposures in the future so that its members can remain updated on the latest developments worldwide. On the other hand, furniture exhibitions and fairs have become the main channel for the manufacturers to obtain the latest information on market developments. Export Furniture Exhibition, which is organised under the umbrella of the Malaysia Furniture Entrepreneur Association (MFEA), is the most important exhibition and fair for the Muar furniture industry.

As for links with government services and municipalities, the Muar furniture manufacturers work closely with the MFPC because it has been actively helping the industry seek opportunities in and penetrate the global market. Furniture manufacturers have no alternative but to maintain close links with the Muar Municipal Council, because it is the basic infrastructure for the industry activities under their jurisdiction. No significant link appears to exist between the ministries and the furniture players, however. The industry feels that the ministries do not understand its needs. Among the examples constantly cited are the issue of foreign workers and land policies. In terms of public funding for upgrading technological capabilities, although government agencies such as the SME Corporation, the Ministry of Science, Technology, and Innovation (MOSTI), and the Ministry of International Trade and Industry (MITI) provide numerous grants and soft loans, the industry appears to show little interest in those facilities.

Because most of the furniture manufacturers opt to train their staff through in-house, on-the-job training, their relationships and collaborations with training and research institutions is distant. The few facilities that they use are the FTL of FRIM and WISDEC. Universities, colleges, and schools, and even the Ledang Industrial Training Institute located next to Muar District, does not attract their interest. Besides being reluctant to release their full-time employees to attend training courses and programmes, furniture manufacturers also believe that the programmes that are heavily grounded on the concept of "automation and computerisation" do not suit their needs. The industry's most critical need is product designers. Such a programme, however, is not available in most training centres.

5.6. Summary

This study’s findings prove Marleba’s Sectoral Innovation Systems framework, in which various heterogeneous actors are involved in the dynamics of innovation at the sectoral level. In the case of the wooden furniture industry in Muar District, these actors are firms (e.g., customers, suppliers, SMEs, and large enterprises) and non-firms (e.g., industry associations, promotional councils, government agencies, local authorities, banking institutions, training institutes and schools). As highlighted in Malerba (2002), these actors are linked with market and non-market relationships in various ways. Evaluating the effectiveness of these links shows that the manufacturers are linked closely to their business environment when compared to public systems. Universities and government organisations were beyond the firms’ sphere of interest. This is in line with the SME-centric universe framework proposed by Woolgar et al. (1998) and as a supplier-dominated traditional industry as described in Pavitt (1984) and Tidd et al. (2005). The dynamics of innovation in the industry is supported by the strong network relationships among companies and supportive social networks. Additionally, the Muar furniture industry has exhibited some similarities with characteristics of furniture clusters in Canada (Drayse, 2011), Denmark (Asheim and Coenen, 2005), Indonesia (Berry et al., 2002), and the Philippines (Beerepoot, 2004) in terms of its OEM-based, subcontracting activities, sources of innovation, and dependencies on foreign workers.

6. Conclusion and policy implications

This paper has attempted to address the dynamics of innovation in a low-tech industry; that is, the wooden furniture industry in Malaysia. It has addressed this issue from two perspectives: (1) innovation actors, and (2) links among the innovation actors. This paper has focused at the micro-level (particularly in the case of innovation patterns of SMEs). Through extensive empirical evidence, this paper not only contributes to the literature regarding the dynamics of innovation in low-tech industries, but also provides some important policy implications, which are highly relevant for Malaysia and other developing and emerging economies.

The findings suggest that the success of the wooden furniture in Malaysia is due to the collective effort of all the innovation actors in...
the industry, particularly the immediate business environment. The suppliers for example, provide the manufacturers with what is needed for the furniture manufacturing process, such as machinery and equipment and wooden materials. Retailers are crucial for marketing purposes, whereas the customers are the recipients of the furniture products. On the other hand, supporting industries such as fabric, painting, vanishing, finishers, foams, and adhesives provide support in terms of added value to the value chain of the furniture manufacturing. These four pillars of the immediate business environment are crucial (Woolgar et al., 1998). The results agree with Pavitt’s (1984) and Tidd et al.’s (2005) view that the wood product industry is a supplier-dominated industry, with the suppliers of production inputs as the main source of new technologies. Partnership arrangements under the category of external and commercial markets are the most preferable among the innovators to obtain knowledge and information.

In the case of Muar furniture cluster, the relationship among the community (and the furniture industry players) is close. Competitors enjoy strong social capital and mutual understanding and see each other as partners on their way to advancing to greater heights in the international arena. The Muar furniture cluster’s achievements are built upon the collective efforts of the entire Muar furniture industry. They are always ready to share business opportunities and information. In fact, many of the component part suppliers were former employees of the larger companies that retain a considerable amount of trust and loyalty. Moreover, provided the manufacturers have clean financial records, it is not typically a problem for the Muar furniture industry to obtain financial loans from commercial banks because most of the branch managers are well aware of the industry’s potential.

In terms of policy implications, the paper shows that although the government has provided various incentives and supporting infrastructure to stimulate the technological capabilities of the industry, the lack of effective cooperation and mutual understanding between the government and the industry has resulted in the poor take up rate of this government assistance, particularly in terms of R&D, technology upgrade funding, and human capital development programmes. Hence, efforts should be made to foster effective government–private partnerships, which must be based on mutual trust and continuous, active exchange of information and views rather than just formal hosting of dialogues, conducting workshops, or ad-hoc, round-table discussions. In addition, the government agencies and the trade associations need to undertake awareness programmes on a regular basis to update the industry on the latest incentives, financial assistance, and grants that the government provides.

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References


