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KNOWLEDGE AS A CRITICAL RESOURCE IN INNOVATION AMONG SMALL FURNITURE COMPANIES IN INDONESIA
An Exploration*

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The furniture industry makes a significant contribution to the Indonesian economy but is exposed to an intensifying competitive environment and to emerging shortages of raw material. These circumstances have prompted small furniture manufacturers in the district of Jepara to undertake several types of innovation. It appears that of all first ranked innovations, product innovation is the largest category. In the overall pattern of innovations, market innovation and logistics innovation are also important, a situation that can be explained by the typical character and current circumstances of the furniture industry in this area. The innovation process concerned mainly relies on traditional knowledge sources, namely in-house learning-by-doing and experimentation, and buyers (customers). However, the manufacturers show willingness to use other knowledge sources in the near future, particularly more formal and globally oriented ones, such as exhibitions, research institutions, and the Internet. What tends to hamper such progress is that the manufacturers' capability to access these knowledge sources is limited by financial obstacles and to a smaller extent by complexity and language obstacles. The paper concludes with a few policy recommen-

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dations and potential directions of future research. One of the policy recommendations aims at a combination of the traditional way of knowledge generation through in-house learning-by-doing and experimentation with knowledge from modern and formal sources.

***Keywords*:** clusters; developing economy; furniture industry: Indonesia; innovation; knowledge sources; SMEs

Setting the Scene

The district of Jepara in Central Java (Indonesia) has a long tradition in manufacturing of furniture. It is well-known for high quality furniture produced by large numbers of small businesses. In Jepara alone, there are around 3,500 small and medium sized manufacturers in this sector. The products of the area are sold in the domestic market as well as for export. The furniture manufacturers in Jepara contribute significantly to Indonesia's export in the non-oil segment. In 2002 and 2003, values of furniture export from Jepara amounted to US$ 76.11 million and 111.73 million respectively, representing shares of 5.16 percent and 7.31 percent of the total national furniture export (see Annex 1).

The value of furniture exports from Jepara has reached a peak during the economic crisis that hit Indonesia from 1997 until 2000. The decreasing value of the Indonesian currency (rupiah) against the American dollar made the furniture products from Indonesia more competitive in international markets. In 2001, despite an increase of the number of exporters and export destinations, the value of the export decreased dramatically. However, from 2001 the value of export increased again to a certain extent. It seems that the export position of furniture manufacturing benefits from several kinds of innovations, particularly an increased quality and design of the furniture. At the same time, logistics innovations seem necessary to maintain or increase exports, particularly in those cases where the use of high quality raw materials needs to be guaranteed.

It has now become commonplace to refer to knowledge as the primary input into economic processes and as a crucial condition for the ability of companies, communities and individuals to participate successfully in the global economy (Reich 1991; Hollifield and Donnermeyer 2003). New knowledge increasingly creates business opportunities and becomes a valuable output of economic activity, even in poor countries (Melody 1985). According to modern resources-based theory (Barney 1991), resources that are distributed heterogeneously across companies and are difficult to imitate will give a company sustained competitive advantage. New knowledge is such a resource under particular conditions.

Several studies indicate a significant effect of new knowledge on the innovativeness of a company. Rothwell (1991) in the European context, finds that small firms that employ extensive relationships with external parties, including knowledge exchange, are more successful in innovation. More recently, Kristiansen et al. (2005) in a study among Tanzanian cottage industries find a similar result in that knowledge obtained from various sources (i.e. media, social networks, and customer relations) has a significant impact on innovation. However, it should be noted here that the findings are mixed. In a study in Russia, Johannessen et al. (1997) observe that the use of new knowledge is not significantly linked to the perceived success of innovation. These mixed experiences may be attributed to differences in types of the knowledge concerned, e.g. standard, non-standard, the subject of this knowledge, e.g. technology, the market, suppliers, etc., and a different capability of companies to absorb the new knowledge. Against this background, the current study aims to clarify the role of various types of knowledge in the innovation process and the potential of companies to access new knowledge, with special reference to small- and medium-sized enterprises (SMEs) in Indonesia. Indonesia is taken as an example of developing countries and the furniture industry is taken as an example of traditional manufacturing in such countries. The research questions addressed in this study are:

(1) Which types of innovation (e.g. product, process and market innovations) are implemented by Indonesian SMEs in the furniture industry and what is the level of innovativeness of these SMEs?
(2) Which are the main sources of new knowledge in this context and how is this pattern influenced by various obstacles to access?

The paper is divided into five sections. The next section presents the theoretical perspectives and concepts used in our analysis, mainly resource-based theory and concepts concerning innovation and knowledge. This is followed by a section on the research design of the empirical study. Next, the paper presents the results of the empirical analysis on the type of innovations, and the importance of several knowledge sources and obstacles to access these knowledge sources. The paper concludes with some brief policy recommendations and future research lines.

Theoretical Perspectives

Resource-Based Theory

Barney (1991: 101) defines resources as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enables the firm to conceive of and implement strategies that improve its efficiency and effectiveness." In resources-based theory it is argued that resources may be heterogeneous across firms in an

industry (resource heterogeneity) and that these resources may not be perfectly mobile across firms (resource immobility). Resources that are heterogeneous and immobile will give a sustained competitive advantage to a firm.

In addition, if a resource is to be a source of competitive advantage, it should be valuable. According to Porter (1995), a valuable resource will enable a firm (1) to reduce costs and thus enhancing its cost leadership strategy, or (2) to improve the attractiveness of its products, thus providing an improved differentiation position. However, if the resources concerned are owned by various competitors, then these cannot be a source of competitive advantage. Hence, to be in the forefront of the market, a firm should always seek for valuable resources that are not ubiquitous or cannot be gained easily. Furthermore, a resource will be a source of sustained competitive advantage if it is difficult to be imitated by competing firms. If not, the competitive advantage will be only temporary. A further important characteristic of resources to be mentioned here is substitutability. The resource as a source of a sustained competitive advantage must be difficult if not impossible to be substituted by other resources. In conclusion, that resources including new knowledge, may work as a source of competitive edge only under a number of limited conditions.

Innovation among SMEs

Innovation in a firm is a multidimensional concept (Neely et al. 2001). An innovation can be defined as "an idea, practice, or object that is perceived as novel by an individual or other unit of adoption" (Rogers 1995: 11). In another definition innovation is considered as "any ideas, practices, or material artifacts perceived to be new by the relevant unit of adoption" (Zaltman et al. 1973: 10). Wissema (2005) argues that "innovation is the successful introduction of something new, successful as shown by acceptance in the market or other use." This implies that the process that leads to an innovation is only partly a technical or scientific process. It is very much also a commercial process, putting the new product in the market.

In the management literature, particularly that on innovation and growth of firms, several types of innovations have been identified, i.e. product, service, process, market, logistics, and organizational innovations (Neely et al. 2001; Johannessen et al. 2002; Avermaete 2003). An illustration of what these different types of innovations may embrace is given in Table 1. Thus, product innovations not only encompass new product characteristics like the material or components used, but also new designs. Similarly, market innovation is a quite broad concept, including new geographic markets and deepening of existing

Table 1. **Types of Innovation**

Type of Innovation	Description (main examples)
Product Innovation	Changes in design, components, and product architectures
Service Innovation	Changes in ways to service customers and new services
Process Innovation	Adaptation of existing production lines, implementation of new (process) technologies
Market Innovation	Exploitation of new territorial markets, penetration of new market segments
Logistics Innovation	New modes of logistics to achieve raw material, new outbound logistics (towards customers)
Organizational Innovation	New managerial systems like production control, quality management, and organizational adaptation like decentralization of authority and new ways of human resource management

markets by new market segments. Note that the presentation of innovations in Table 1 suggests that innovations are stand-alone events. In practice, however, different types may occur simultaneously because they are connected with each other. Thus, to a certain extent product innovations cannot go without process innovations and organizational innovations because the latter two are a condition for the first ones.

It seems obvious that the types of dominant innovations are not the same across the world economy. In core regions of developed countries, the emphasis is often on new products based on new technologies (like biotechnology and new materials) and new services (e.g. supported by new concepts derived from integration with information and communication technology), whereas in peripheral areas in these economies and in developing economies the emphasis is often on process innovations aimed at a reduction of costs, e.g. in processing based on low costs of labor and raw material inputs (see e.g. Vernon 1966). Likewise, the newness of innovations differs across the world, with innovations new for the country and new for the world almost exclusively in developed countries. The previous assumptions are, of course, derived from simplified models and need to be fine-tuned for developing countries.

Knowledge

It is now widely recognized that knowledge assets are highly important for the development of firms. In this context, the basic "ingredient" is people, not technology (Claver et al. 1998; and Woodman et al. 1993 as cited in Prajogo et al. (2004)). In terms of people, the main factors are the capability to be open to new knowl-

edge, to understand new knowledge and to absorb it in such a way that it can be used on the work floor and at the same time be evaluated and enriched based on practical experiences. Many authors have argued that knowledge management is an important business activity and a determining factor in innovation (Nonaka and Takeuchi 1995; Johannessen et al. 1997; MacDonald 1998). For instance, according to Cohen and Levinthal (1990) knowledge capacity –defined as an organization's ability to recognize the value of new external knowledge and to assimilate and apply it effectively– is a critical part of an organization's innovative capability. In a recent study, Darroch and McNaughtan (2002) show a positive and significant relationship between knowledge management and innovation performance.

Another point considered relevant in this study is the origin or source of new knowledge. According to Afuah (2003), knowledge sources can be classified as *functional* sources of innovation into five major categories: (1) internal value-chain functions; (2) external value-added chain of suppliers, customers, and complementary innovators; (3) university, government and private laboratories; (4) competitors and related industries; and (5) other nations or regions. Seen from a slightly different perspective, one may also distinguish between so-called *circumstantial* sources (Afuah 2003) indicating when or under what circumstances one may expect an innovation. Examples of this type of sources are planned activities, e.g. experimentation on purpose, unexpected occurrences, e.g. failure in production and main changes outside the firm, e.g. technological discontinues, deregulation, and globalization. Some authors expect that a pattern in which informal sources in developing economies play a more important role rather than in developed economies, like family businesses, friends and customers, but also different practices and styles of innovation related with the specific culture and social and institutional forces (e.g. Hofstede 1991; Holden 2002).

In many cases the new knowledge is developed in other organizations at a distance from the firms concerned, meaning that the knowledge needs to be transferred. To this purpose, several channels may be used like personal communication using face-to-face contact with customers, telecommunication modes (the Internet and television), branch journals, technical manuals, visits to exhibitions, etc. (van Geenhuizen 1995). The transfer of knowledge from the source to users may be rather expensive. Ogawa (1998) summarizes various reasons for high costs of the transfer process, like the nature of the knowledge itself –e.g. a tacit character, high complexity and a protected status of the knowledge– and the type of channel used for transfer. In this context, Von Hippel (1995) categorizes knowledge as "sticky" if it is (very) costly to transfer due to characteristics of the knowledge itself and characteristics of and choices made by the knowledge providers and users.

For instance, if small manufacturers in developing countries seek information on technological solutions to particular production problems, they may face sticky information due to a high complexity of the information, charges for access to this information, and large distances to the equipment manufacturers and knowledge institutes where the knowledge is developed. By adopting a spatial point of view, a different situation may be expected in clusters of nearby, related or competing, companies. Many authors assume that in particular spatial clusters –facing longstanding and trustful relations between the companies concerned, like suppliers, customers, competitors– search costs for new knowledge are low and much knowledge circulates for free (e.g., Audretsch 1998; Maskell and Malmberg 1999). A frequent interaction, partially due to meeting by chance and to a similar social context, lies at the basis of these ideas. Such a situation may apply both to developed and developing economies. Whether the new knowledge can be accessed and absorbed successfully not only depends on the origin of the knowledge and the channel of transfer, but also on the capability of the firms concerned. It is plausible that various structural characteristics influence this capability, like age, size and corporate position (e.g. subsidiary or an independent position), and membership of a community that provides the tools to easily understand and absorb the new knowledge.

The above assumptions about different innovations and sources of new knowledge, including stickiness, and the capability of firms to access and absorb new knowledge call for appropriate applied work.

Research Design

Sample and Interviews

This study employs an extensive fieldwork in the furniture industry in the district of Jepara in Indonesia. As stated in the outset, Jepara is selected as research sites because of its important role in national furniture industries in Indonesia. Respondents are owners/ managers of a furniture manufacturing company. Three sub-districts (Tahunan, Pecangaan, and Welahan) located at a different distance from the city of Jepara are selected as research sites. Tahunan is the closest sub-district to the city of Jepara, while Welahan is the most distant one. Many furniture manufacturers are also found in Pecangaan. Furniture manufacturers in Welahan are located in a less concentrated pattern compared to those in Tahunan and the northern part of Pecangaan. Three villages are selected in each sub-district. The sampling is based on visibility of the manufacturers and researchers' knowledge about existence and development of the furniture industries in the villages. This approach is the only way to ensure a sufficient level of representativeness, because it is difficult to draw a repre-

sentative sample from the industry due to lack of statistics. Most furniture manufacturers are not registered as companies or do not have any legal status. This is typical for Indonesian SMEs that should be seen as home industry or family business. Often only exporting companies are registered as companies.

Data were collected in April and May 2005, using personal face-to-face interviews. In case such interviews were not possible, the "drop and collect" procedure was used. A preliminary version of the questionnaire has been tested to ensure validity of the answers, and then the questionnaire was adapted with some terms and the sequence of a few questions. All questionnaires that were returned turned out to meet our quality standards. All in all, according to estimations by the furniture association, the sample of 90 manufacturers represents 2.57 percent of the population of furniture manufacturers in Jepara.

The major aim of the interviews with owners/managers of furniture businesses was to uncover the type of the three most important innovations in recent years and the type of expected innovations in the near future, as well as the sources of knowledge supporting the innovation process and obstacles to access such sources. "Most important" in the context of innovation was measured in terms of contribution to turnover. In next section, some characteristics of the sample will be discussed, because insight into these characteristics may contribute to an explanation of different patterns of innovation and knowledge access.

Characteristics of the sample

The vast majority of respondents (94.4%) are male entrepreneurs. Most respondents (63.3%) have an educational level of junior and senior high schools. A majority of the companies in the sample (80.0%) is independent and the remaining are subsidiaries. All manufacturers in the sample are classified as SMEs since their number of employees is less than 100 persons. However, a majority of the companies is very small (80.9% falls in the class of less than 25 employees). On average, the number of employees is 17. Most of the manufacturers (83.3.%) have been in operation for 10 years or less. On average, they have run their furniture business for 8 years.

Innovation and Knowledge Sources

Type of Innovation

Product innovation is considered as the most important type of innovation by almost half of the furniture manufacturers (47.8%) (Table 2). New product designs and new types of product are the most common product innovation. The second most important type of innovation is logistics innovation, e.g. use of new raw material, and use of new sources/suppliers of raw material, witness a share of one third (34.4%).

Table 2. **Most Important Types of Innovation**

Type of innovation	Innovation 1		Innovation 2		Innovation 3		All	
	n	%	n	%	n	%	n	%
Product	43	47.8	18	20.0	25	27.8	86	31.9
Service	4	4.4	7	7.8	17	18.9	28	10.4
Process	4	4.4	8	8.9	7	7.8	19	7.0
Market	25	27.8	23	25.6	24	26.7	72	26.7
Logistic	14	15.6	31	34.4	17	18.9	62	23.0
Organizational	0	0.0	3	3.3	0	0.0	3	1.1

The third most important innovation is again product innovation (27.8%). However, the latter type of innovation is followed at a close distance by market innovation (26.7%). Altogether, product innovations are dominant among Indonesian SMEs in the furniture industry, with market and logistics innovations in second place. Of all reported innovations, 31.9 percent are product innovations. Organizational innovations are very rare (1.1%).

The dominance of product, market and logistic innovations over other types of innovation may be attributed to the specific nature of the furniture industry, i.e. critically dependent upon a sufficient differentiation of products to meet changing consumers' demand, upon markets that need to be maintained, and upon a high level of logistics (i.e. concerning raw material) required to yield quality products.

In addition, the literature on organizational innovation indicates that most firms that reengineer their managerial systems and the way they organize their business are the larger ones. This explains the very low frequency of organizational innovations in the furniture industry. Moreover, the typical Indonesian culture in which uncertainty avoidance is very high (Hofstede 1991) may be an explanation of this finding. A society with a high preference for uncertainty avoidance tends to avoid high risk that is inherent in organizational innovation.

When focusing on the newness of innovations (Table 3), the vast majority (81.0%) of the innovations are only new for the firm. As little as 11.8 percent of the innovations are new for the sector in the region, 5.3 percent are considered as new in Indonesia, and the rest (1.9%) is considered as new in the world. The innovations that are considered to be new in the world include four product innovations and one logistic innovation. By contrast, the few process innovations appear to be mostly new for the firm with some exceptions of newness for the region. It may concluded that –based on the newness of

Table 3. **Newness of Innovations**

Type of Innovation	New for the Firm		New for the Sector in the Region/Cluster		New for the Sector in Indonesia		New in the World	
	N	%	N	%	N	%	N	%
Product	67	79.8	9	10.7	4	4.8	4	4.8
Service	24	85.7	2	7.1	2	7.1	0	0
Process	16	84.2	3	15.8	0	0	0	0
Market	58	85.3	8	11.8	2	2.9	0	0
Logistic	45	73.8	9	14.8	6	9.8	1	1.6
Organizational	3	100.0	0	0.0	0	0.0	0	0.0
All	213	81.0	31	11.8	14	5.3	5	1.9

the innovations– the level of innovation among the furniture manufactures is relatively modest.

However, it should be necessary mentioned here that the nature of innovations and their social and cultural context in developing economies seem different from the ones in developed economies. For that reason, it may be more appropriate to measure innovation and newness of innovation in a different way, i.e. matching with the local situation in family business in developing countries.

Knowledge sources

As shown in Table 4, new knowledge is partly developed *within* the firms and partly derived from external sources. Learning-by-doing and buyers (customers) are considered as the most important knowledge source by the furniture manufacturers, witness an average score of 4.15 on a five point scale for each. A high importance of these sources is also true merely for the most important innovation (scores of 4.03 and 4.14, respectively). In addition, experimentation on purpose and contacts with business partners are seen as influential knowledge sources (scores of 3.96 and 3.66, respectively). Suppliers are also an important knowledge source (a score of 3.27) but the variation in this score seems relatively large. It appears that the manufacturers –in the current situation– attach a low importance to the Internet as a source of knowledge (a score of 1.73). This situation may be explained by a small availability of access to the Internet among them (11.1%). Similarly, consultants and research institutes/universities seem not important, as these are not among the 10 highest ranked sources.

Our in-depth interviews indicate that many manufacturers produce the

Table 4. **Knowledge Sources (Selected) (a)**

Source	Innovation 1		Innovation 2		Innovation 3		All	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Learning by doing	4.03	1.16	4.13	0.94	4.29	1.04	4.15	1.05
Experimentation on purpose	3.73	1.28	4.04	1.02	4.11	1.02	3.96	1.12
Buyers/customers	4.14	1.22	3.99	1.10	4.33	0.97	4.15	1.11
Suppliers	2.93	1.55	3.39	1.43	3.49	1.30	3.27	1.44
Business partners	3.76	1.17	3.60	1.15	3.63	1.02	3.66	1.11
Friends/colleagues/neighbors	2.82	1.56	2.50	1.33	2.52	1.42	2.61	1.44
Competitors	2.88	1.36	2.46	1.33	2.83	1.28	2.72	1.33
Industry association	1.89	1.26	1.94	1.30	2.20	1.50	2.01	1.36
Exhibitions	2.40	1.56	2.53	1.43	2.76	1.38	2.56	1.46
Magazines/newspaper	2.44	1.29	2.55	1.22	2.74	1.29	2.58	1.27
Television/radio	2.28	1.29	2.36	1.29	2.62	1.31	2.42	1.30

(a) Selection of sources facing an overall average score of > 2.00, thus excluding religious affiliations, research institutes and universities, consultants, governments and the Internet.

furniture on demand or based on customers' order. Hence, not surprisingly buyers (customers) are important sources of knowledge for innovation. Also, in a society with a collectivist culture as in Indonesia (Hofstede 1991) sharing culture is very important in daily life, including in business relationships. Accordingly, business partnerships are considered as an important source of knowledge about innovation. In this context, business partnerships are more informal than relationships with industry associations. Only a small part of the manufacturers in Jepara (about 400) have joined the industry association, since this association is not able to meet the expectations of its members. This may explain why the industry association is considered as an unimportant source of knowledge.

In addition, it appears that the most important external sources are those facing a low stickiness. In most cases, buyers (customers) and suppliers visit the manufacturers on a frequent basis, without any cost for the latter. Such information or knowledge transfer happens in a local synchronous mode, through face-to-face contact. The advantages of this mode are the creation of trust and high quality (richness) of knowledge, with an emphasis on tacit and contextual knowledge (van Geenhuizen and Nijkamp 2000 as cited in van Geenhuizen 2004). To date, the manufacturers avoid using

Table 5. **Obstacles to Access New Knowledge**

Obstacle	N	%
Financial	199	80.2
High level of complexity of new knowledge	25	8.1
Large physical distance to knowledge source	11	4.4
Language barriers	6	2.4
Others	10	4.8

N = 251 (obstacles)

knowledge with a high stickiness, such as those gathered from the Internet, research institutions/universities, and consultants. This finding seems consistent with the most severe obstacles faced by the manufacturers, i.e. financial obstacles (Table 5).

Most manufacturers are facing serious obstacles in getting access to new knowledge in the innovation process. As much as 94.7 percent of them experience such obstacles and only very few (5.3%) experience a smooth access to the knowledge needed. This situation indicates a low availability of new knowledge and/or a low capability to access new knowledge. With regard to the nature of the barriers, financial problems are by far the most frequently reported barrier (80.2%) (Table 5).

Other obstacles are a high level of complexity of the new knowledge (8.1%) and a large physical distance to knowledge sources (4.4%). The small size of the firms and the independent status (not being part of a larger company) may contribute to an explanation of the high incidence of financial barriers.

The importance of knowledge sources varies from a type to others types of innovation. For instance, as indicated in Table 6, knowledge gained from learning by doing and competitors are significantly more important for product innovation than for market innovation. Information from buyers (customers) is considered more important for product, service, and market than for logistic innovation. On the other hand, information from suppliers is significantly more important for logistic innovation than for other innovation. It seems that the particular nature of the innovation implicates the use of specific sources, like a new design calling for knowledge e.g. from competitors, and logistics innovation on the input side of the firm calling for information from raw material suppliers.

When comparing of the importance of particular knowledge sources for innovation between clustered (i.e. Tahunan) and non-clustered (i.e. Pecangaan and Welahan) locations, we observe that the manufactures in a clustered location have a significantly

Table 6. **Importance of Knowledge Sources for Different Types of Innovation (selection)**[a]

Source of Knowledge	Product	Service	Process	Market	Logistic	Organizational	Comparison of means[b]
Learning by doing	4,29	4,14	4,42	3,96	4,11	4,00	Product>Market*
Buyers (customers)	4,31	4,21	3,95	4,42	3,66	4,00	Product>Logistic** Service>Logistic* Market>Logistic**
Suppliers	2,80	3,29	3,26	2,97	4,30	3,00	Logistic>Product** Logistic>Service** Logistic>Process** Logistic>Market**
Competitors	3,03	2,50	2,89	2,41	2,74	1,67	Product>Market**
Exhibitions	2,50	2,46	2,58	2,85	2,34	3,00	Market>Logistic*

[a] Only significant differences in importance are shown.

[b] One-way ANOVA and LSD (least significant differences) post-hoc tests are used to compare the means.
*p<0.05; **p<0.01

Table 7. **Importance of Knowledge in Clustered and Non-clustered Locations**

Source of Knowledge	Mean Rating of Importance		Mean Differences	t
	Clustered	Non-clustered		
Learning by doing	4.36	4.05	0.31	2.27 *
Experimentation on purpose	3.73	4.08	- 0.34	-2.40 **
Buyers (customers)	4.32	4.07	0.26	1.79
Suppliers	3.49	3.16	0.33	1.77
Business partners	4.07	3.46	0.61	4.37 **
Friends/colleagues/neighbors	3.61	2.11	1.50	9.30 **
Religious affiliations	2.88	1.54	1.34	8.65 **
Competitors	3.12	2.52	0.60	3.58 **
Industry associations	2.91	1.57	1.34	8.61 **
Research institutes, universities	2.53	1.39	1.14	9.15 **
Consultants	2.54	1.42	1.13	7.73 **
Exhibitions	3.21	2.23	0.98	5.44 **
Governments	2.69	1.60	1.09	7.31 **
Magazines/newspaper	2.96	2.39	0.56	3.52 **
Television/radio	2.89	2.19	0.70	4.32 **
Internet	2.57	1.32	1.25	7.50 **

Notes: *p<0.05; **p<0.01

higher exposure to many external sources of knowledge than firms in a non-clustered location; this holds particularly for friends/colleagues/neighbors, religious affiliations and industry associations (see Table 7). Note that the two latter sources belong to the generally less important sources of new knowledge, which suggests a structurally different pattern of knowledge interaction in clusters. In addition, the research finds that one internal source of new knowledge is more important in non-clustered locations, i.e. experimentation on purpose. Knowledge spillovers between firms in clustered locations may not reach those in non-clustered places, meaning that a greater effort is needed in own development of new knowledge in these places. The previous pattern broadly complies with the findings in other studies in that companies in a clustered location benefit from a relatively high level of knowledge availability (spillovers) and sharing of resources (e.g. Porter 1998; Robertson and Yu 2001; van der Panne et al. 2003).

Expected Situation in the Near Future

With regard to expectations about the near future, the furniture manufacturers tend to focus on market (35.2%), logistics (28.4%), and product (20.5%) innovation. Accordingly, different from the current situation, market and logistic innovation are considered to be more important than product innovation. A declining value of sales (including the value of export) and a decreasing availability of high quality raw material (i.e. wood) are among the potential explanations for this change. Manufacturers nowadays have to struggle to create and grasp the market in a stiffer competition, and hence market innovation is of prime importance. As revealed from the in-depth interviews, most furniture manufacturers are facing an increasing shortage of quality raw material. In recent years, they even have to "hunt" in countryside areas from village to village to find quality raw material. Supply of raw material by the Indonesian Forestry Company –i.e. a government institution that has authority to manage forestry and its related outputs - cannot meet the manufacturers' demands. Manufacturers are also forced to be innovative in utilizing substitute raw material from alternative woods.

In addition, the manufacturers tend to expect a generally better access to knowledge in the near future, since they value all sources (including sticky ones) as more important in the future than in the present (past) (Table 8). Particularly the Internet and exhibitions are expected to become more important for future innovations. Television/radio is in third place in this respect. These sources indicate that the manufacturer expect themselves to be better connected in the national and global economy in the near future. However, they forward the same potential prob-

Table 8. **Importance of Current and Future Knowledge Sources**

Source of Knowledge	Mean Rating of Importance		Mean Differences	t
	Clustered	Non-clustered		
Learning by doing	4.15	4.47	0.32	3.68 **
Experimentation on purpose	3.96	4.37	0.41	4.06 **
Buyers/customers	4.15	4.38	0.23	2.34 *
Suppliers	3.26	3.95	0.70	5.88 **
Business partners	3.65	3.95	0.30	3.52 **
Friends/colleagues/neighbors	2.61	2.89	0.28	2.86 **
Religious affiliations	1.97	2.22	0.26	2.83 **
Competitors	2.72	3.23	0.51	3.84 **
Industry associations	2.01	2.58	0.57	4.93 **
Research institutions/universities	1.76	2.24	0.48	4.96 **
Consultants	1.79	2.07	0.27	3.26 **
Exhibitions	2.57	3.71	1.13	7.52 **
Governments	1.96	2.51	0.55	5.11 **
Magazines/newspaper	2.59	3.38	0.79	6.78 **
Television/radio	2.44	3.33	0.89	8.59 **
Internet	1.75	3.48	1.73	9.96 **

Notes: *p<0.05, **p<0.01

lems to access new knowledge in the future as they do for the present, i.e. financial obstacles are mentioned by 84.7 percent of them.

Concluding Remarks

This paper gives the first results of an exploration of innovation patterns in a traditional manufacturing sector in Indonesia, i.e. the furniture industry. The findings support the idea of a generally low level of innovative-ness, because most of the innovations are only new for the firm and for a small part new for the region. However, such innovations may still significantly contribute to an increased competitiveness of the furniture industry. The idea that most innovations aim at cost reduction is not supported by our empirical findings. Of all first ranked innovations, product innovation is the largest category. In the overall pattern of innovations, market innovation and logistics innovation are also important, a situation that can be explained by the typical character and current circumstances of the furniture industry, i.e. a new design serves to maintain the market and to capture new market segments, and logistics innovations serve to improve the supply of high-quality wood which suffers from the danger of depletion. The innovation process concerned mainly relies on knowledge from in-

house learning-by-doing and experimentation, and on knowledge from buyers (customers). These are traditional sources and allow for knowledge transfer in an informal way. However, the manufacturers show willingness to use other knowledge sources in the near future, such as exhibitions, research institutions, and the Internet. What tends to hamper progress is that the manufacturers' capability to access a diversified set of knowledge sources is limited by financial obstacles and to a smaller extent by complexity and language obstacles.

Although the furniture industry plays a significant role in local (Jepara) and national economic development, from the observation, it indicates that the role of the government in providing knowledge to support new ways in innovation is very limited. To remove barriers to access new knowledge, the government could play a significant role as a facilitator in providing useful knowledge as an input to innovation processes, or as a local intermediary between sticky knowledge sources and the local manufacturers. The government, for instance, could establish information centers based on the idea of communities of practice and expertise, accessible for all firms. The government could also encourage the existing business development service (BDS) to be more proactive in helping manufacturers with government's support to open up new knowledge sources and use the knowledge in practice most effectively. Knowledge from emerging sources like the Internet and exhibitions, but also universities and research institutes, could be made available and translated/transformed by local government services to support the important in-house knowledge generation through learning-by-doing and experimentation.

The results of the study indicate three directions in future research. First, as a basic research line, a study to achieve a more comprehensive understanding of what innovation basically is in the context of small family businesses in a developing economy, and whether new indicators need to be developed to grasp the essentials of innovation in the particular social and cultural context of Indonesia. In a second research direction, the focus may be on the different locations of the manufacturers in terms of density of related businesses (clusters). In this direction, differences in knowledge access and innovation between clustered locations and non-clustered locations may be addressed in a more in-depth way than in the current study, particularly the question whether some essential types of knowledge are available in clustered locations but absent in non-clustered locations. With regard to a third future line, it is important to note here that merely access to new knowledge does not guarantee a better innovation performance. This calls for research on knowledge management and learning attitudes of managers and employees in order to understand how the new knowledge is absorbed and contributes to innovation and broader learning experiences in firms.

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Annex 1. Development of Furniture Export in Jepara

	1999	2000	2001	2002	2003
Value of export (USD million)	201.42	200.51	74.74	76.11	111.73
Number of exporters	221	358	436	451	410
Number of export destination	64	68	71	88	82

Source: Asmindo Komda Jepara 2004

The United States is the most important export destination for furniture products from Indonesia, followed by Japan, the Netherlands, and France. In the case of Jepara's furniture, the most important export destination is also United States followed by Australia, the Netherlands and other European countries such as Germany, France, Spain, and Belgium. The furniture products are also exported to other Asian countries (Korea, Japan, and Malaysia) and the rest to South Africa and Middle East.

Annex 2. Demographic Information

Variable	N	%
Gender of the owner/manager		
- Female	5	5.6
- Male	85	94.4
Level of education of the owner/manager		
- Not completed elementary school	5	5.6
- Elementary school	15	16.7
- Junior high school	29	32.2
- Senior high school	28	31.1
- University	13	14.4
Status of the firm		
- Independent	72	80.0
- Subsidiary	18	20.0
Location		
- Sub-district	7	7.9
- Village	82	92.1
Number of employees (persons)		
- 0-25	72	80.9
- 26-50	13	14.6
- 51-75	2	2.2
- 75-100	2	2.2
Age of company (years)		
- 0-5	31	34.4
- 6-10	44	48.9
- 11-15	7	7.8
- >15	8	8.9