The Effect of Knowledge Stickiness and Interaction on Absorptive Capacity: Evidence from Furniture and Software Small- and Medium-sized Enterprises in Indonesia

The capability of an organization to absorb knowledge from the external business environment and to use it in the development of innovations, referred to as absorptive capacity, has become a principal issue in organizational studies. Following Waalkens (2006), we have applied innovation as the indicator of a firm’s absorptive capacity. This capability primarily concerns the skill of an organization to obtain (new) knowledge and use it in stimulating its innovation activities as an active response to a constantly changing market. The vast majority of studies on absorptive capacity are specifically focused on absorptive capacity in the context of large companies in developed countries. Only few have been conducted in the setting of small- and medium-sized enterprises (SMEs) in a developing country. This is why we have chosen this particular context for our research, which deals with the absorptive capacity (i.e. concept and measurement) of SMEs in Indonesia, a developing country.

A firm’s absorptive capacity is determined by the way in which the organization processes (new) knowledge from the external environment. From the perspective of the resource-based and the knowledge-based theories, knowledge can be considered as a strategic resource for strengthening a firm’s competitiveness. (External) knowledge has several characteristics. From the receiver organization’s point of view, these characteristics may influence the capability to absorb and utilize this knowledge in its innovation policies. The degree to which it is easy or difficult for an organization to absorb information from the external environment is referred to as the stickiness of external knowledge. The stickiness of external knowledge in terms of its interconnectedness between domains (i.e. product, process, organizational) and
its types (i.e. sensory, coded, and theoretical knowledge) affects a firm's capability to absorb this information and utilize it to conduct product, process, and/or organizational innovations. In this study, stickiness is viewed from the perspective of the receiver. The definition of the stickiness of knowledge is based on the degree of its accessibility, referring to the various levels of ease or difficulty with which information can be obtained and understood, both cognitively and physically.

Further, a firm's absorptive capacity is crucially dependent on its interaction with external knowledge providers. Interaction is a prerequisite for obtaining relevant knowledge from external parties in the business environment. The knowledge providers as the external participants in this interaction can be classified into three groups: direct individual sources (i.e. buyers, suppliers, competitors, and consultants); direct institutional sources (i.e. government offices, industry associations, religious affiliations, and research institutions/universities); and indirect sources (i.e. exhibitions, magazines, television, radio, and the Internet). The interaction between an organization and its environment takes place through various communication channels, such as face-to-face meetings, telephone, facsimile, and email.

Our main research questions are as follows:
1. What is the effect of stickiness of external knowledge on a firm’s absorptive capacity?
2. What is the influence of interaction on a firm’s absorptive capacity?

For our study we conducted an extensive survey among 198 SMEs (i.e., 98 furniture firms and 100 software firms) scattered in various cities in Indonesia (i.e., Yogyakarta, Bandung, Malang, and Surabaya). In this study, the furniture sector represents the less knowledge-intensive companies and the software sector the more knowledge-intensive firms. The data were collected from October 2007 until March 2008 by means of personal face-to-face interviews with the firms’ owners or other (top) managers. We performed a hierarchical regression analysis to answer the research questions.

The current study showed that knowledge stickiness has a significant impact on a firm’s absorptive capacity. The lower the level of stickiness of a piece of external knowledge as perceived by the (furniture and software) SMEs in our sample, the higher the absorptive capacity of these organizations. More specifically, we found that of the four indicators, only knowledge interconnectedness and coded knowledge have a significant effect on the companies’ absorptive capacity. The more interconnected the external knowledge, the higher their absorptive capacity. Likewise, the more coded the
knowledge, the more accessible it is to firms for the purpose of creating innovative products.

Another finding indicates that the interaction between the furniture/software firms and their environments has a significant effect on their absorptive capacity. Further, the more frequent the interaction of firms with the external environment, the higher their absorptive capacity. The model used accounts for 26% of total the absorptive capacity variance. The study also indicates that the effect of knowledge stickiness on firms’ absorptive capacity is stronger for older and larger companies than for younger and smaller ones. Likewise, the effect of interaction on a firm’s absorptive capacity is stronger for older and larger organizations than for younger and smaller enterprises.

The research confirms that the level of absorptive capacity of the software firms, which represent the more knowledge-intensive organizations, is significantly higher than that of the furniture firms, as the representatives of the less knowledge-intensive companies.

Considering the results of this research, several contributions can be listed. Firstly, the current study has increased our understanding of the absorptive capacity concept in the specific context of SMEs in a developing country, a research setting which has only received little attention so far. Measurements based on R&D spending or the numbers of patents, which are commonly used to analyze large companies in developed countries (see Cohen and Levinthal, 1989; Daghfous, 2004), are not suitable for studying emerging economies in developing countries, such as Indonesia. Our research confirmed that only a handful of SMEs adopt systematic approaches to realizing their innovations. The role of the owner as the initiator and supervisor of innovation policies was found to be very substantial. This is why the number of initiatives and innovations actually realized by the firms proved to be a suitable alternative to the measurement of absorptive capacity in this context. In this way, this study has partly filled the gap in the literature on absorptive capacity as identified by Liao et al. (2003), which especially refers to the lack of attempts to measure the concept in a different way than by means of the R&D context.

Secondly, we initially adopted two indicators of absorptive capacity, namely initiatives representing the potential absorptive capacity, and the actual innovations indicating the realized absorptive capacity (Zahra and George, 2002; Waalkens, 2006). However, our findings showed that these two separate indicators might particularly be relevant in the context of SMEs in developed countries (Waalkens, 2006), but appear to be less suitable for the analysis of emerging economies, such as those in Indonesia. Hence, we concluded that the decision of whether or not to use these indicators should depend on the kind of
products, the branch and the empirical setting. Both are relevant, but often only one or a combination will be sufficient.

Thirdly, another contribution of this study is the finding that the division of knowledge into three types, namely sensory, coded, and theoretical information is not mutually exclusive. A piece of knowledge provided by a particular source may be a combination of the three types mentioned above. In addition, knowledge that is theoretically characterized as coded, may for several reasons by a firm be considered as sensory, for example as a result of the level of its internal expertise. To conclude, our research has shown that the way in which knowledge is perceived and characterized depends on both the recipient organization and its specific context. Although the research setting of this study consisted of SMEs in an emerging economy in a developing country, namely Indonesia, our findings can well be generalized to similar contexts, given the fact that in general more or less the same conditions apply to SMEs, especially to those in emerging economies.

Like any other empirical study, this research is not without its limitations. The first limitation is that in this study, the measurement of absorptive capacity was solely based on the subjective perception of the owner/manager. Although this approach was the most suitable one in the context of our research (furniture and software SMEs in Indonesia), it may have led to bias, the more so because these organizations often have no complete record of the number of innovations realized. If the data available could be made more objective, their measurement will – in turn – yield more objective results.

Second, organizational absorptive capacity is a dynamic construct which includes the entire process of organizational learning within a firm. In our study we reduced the scope of absorptive capacity to a certain point in time (the time during which the empirical research was conducted and related to initiatives and innovations). As a result, we were not able to capture all the other stages of the learning process. Therefore, future research may focus on the whole trajectory, which starts with the retrieval of knowledge and ends with the realization of innovative output.

Third, during our field study we observed that the firms had difficulty in providing reliable information regarding the contribution of innovation to their turnover. This is why the relationship between a firm’s absorptive capacity (i.e., innovation) and its turnover could not be examined. Including an analysis of this relationship in future research would provide more insight into the contribution levels of the three types of innovation (product, process and organizational) in terms of turnover. Moreover, on the basis of this information it would be possible to obtain concrete figures on the actual profitability of
innovation projects.

*Fourth*, knowledge stickiness was approached from the perspective of the cognitive and physical accessibility of external knowledge, while we did not pay any attention to its financial accessibility. The integration of the financial aspect into our analysis has appeared to be important since the firms in our sample considered their lack of financial means as the severest obstacle to the absorption of knowledge from the external environment. Including financial accessibility would have enabled us to examine the costliness of obtaining information from external knowledge sources. The results of this analysis could have then been used to formulate more suitable policies aimed at counteracting the financial obstacles to absorbing external knowledge.

By taking furniture and software firms in Indonesia as an emerging economy as points of reference, we found that SMEs nowadays are in more volatile situation due to an everchanging business environment. To cope with such a situation, the SMEs have no choices other than doing innovation to sustain their existence in a tighter competition and to achieve operational excellences. Actual innovation conducted within the SMEs is relatively modest, and most the SMEs put emphasis on incremental innovations rather than radical ones. The SMEs paid substantial attention to product innovation that promptly leads to direct financial benefits and was less risky, while less attention was paid to process and organizational innovation. External knowledge obtained through intensive interaction with various external parties has an impact in stimulating innovation with the SMEs.

Although the firms in this study represent two sectors that are completely different, despite of differences in some aspects (e.g., export market share, educational level of the employees), the firms also shared some common characteristics relating to innovation. Most of them had no well-planned activities toward innovation. Often, initiatives leading to innovations were impulsively performed without any preceding formal planning, in addition to the fact that only a few firms had a specific R&D department responsible for innovation. Due to this context, separating initiatives (i.e., potential absorptive capacity) from innovations (i.e., realized absorptive capacity) is not a prudent choice. This separation is not based on the size of the firms or the context in emerging economy, but the poor planning processes in firms. Taking this issue into account, the results of the study may be applicable to every firm that is lacking a proper planning towards innovation. On the other hand, even in the SMEs context in developing countries, when the planning stage is properly carried out (such as in construction sectors), separating potential and realized absorptive capacity is a relevant option (cf. Waalkens, 2006).
The findings from this study might be used as a basis for setting up appropriate initiatives and policies to promote the SMEs, especially in the context of emerging economies. For instance, government offices and industry associations as policy makers, can play their role more intensively in providing facilitation for the SMEs, including opening access to information on new products preferred by markets, providing information on new potential markets, information on the availability of raw material in order to ensure its sustainability – especially wood yielded from government-managed forests, in the context of the furniture sector. In addition, significant attention should also be paid to activities in advancing capabilities for SMEs to access knowledge in other language and through the Internet, which is still under-utilized.