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Full Length Research Paper

Determinants of small and medium enterprises performance in the Malaysian auto-parts industry

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This paper examines factors determining the performance of SMEs in the Malaysian auto-parts industry. Using a multiple regression analysis, it is evident that firm age and foreign equity are significantly related to the performance of the firms. This consolidates earlier expectations and studies that age and foreign equity ownership do matter to SMEs performance. These findings provide an important signal for SMEs for entering joint ventures with foreigners in order to achieve better performance and more importantly to compete in the growing open market mechanisms. Only through joint ventures, foreigners would be eager to transfer a package of required assets, including technological, marketing and managerial skills to the local partners. Further research should be conducted to determine the role played by foreigners, who are responsible for improving SMEs performance in the auto-parts industry. Future studies should also incorporate intangible performance measures, such as customer satisfaction, competitive position and quality of product.

Key words: Determinants, performance, SMEs, auto-parts, Malaysia.

INTRODUCTION

Understanding the determinants of small firm performance is one of the notable areas in small business economics literature (Audretsch, 2001; Kimura, 2002). In theory, factors associated with firm performance are different from one field to another. The structure-conduct-performance (SCP) framework argues that firm performance is determined by the conduct of the firms and the structure of the market (Ferguson, 1993). The strategic management area, however, believes that firm-specific factors are more important than any other factors in determining firm performance (McGahan and Porter, 1997). The latter would be more relevant to the high-technology industry, such as the auto-parts making, since firms in this industry require specialized resources and capabilities not only to meet consumer's demand, but also to outperform other competitors.

In Malaysia, despite the long involvement of small and medium enterprise (SMEs) in the auto-parts industry, studies on their performance in this critical sector are extremely limited. Rahman (1994) confines his study to the performance of one firm only. A study by Rosli (2005) compares the performance between the Malay (the indigenous people) and foreign suppliers in the overall auto-parts industry, but he made no attempt to examine factors determining the supplier or firm performance. Some other studies on the performance of SME in Malaysia were also carried out, but their focus was on other industries, such as the machine tools sector (Rasiah, 2002) as well as food and beverage, textiles and wood, and furniture industries (Hashim and Abdullah, 2002). Thus, it is timely for this paper to examine the performance of SMEs in the Malaysian auto-parts industry with reference to factors determining its performance.

Due to the complexity and sophistication of, as well as the high technology, precision and standard required by the automobile industry in general and the auto-parts making industry in particular (Rosli, 2004), the identification of SMEs performance is meaningful in two ways. First, it provides some knowledge about the present characteristics of SMEs performance; and second, the obtained knowledge would enable firms (SMEs, in this context) to track their position, verify priorities as well as communicate and improve performance (Neely, 1998). This identification can also be used (by SMEs) to formulate strategy, communicate goals, make decisions, and motivate employees (Schmitz and Platts, 2003). This

knowledge is increasingly important to auto-parts manufacturers as intense competition posed by global players is growing by the day.

DETERMINANTS OF FIRM PERFORMANCE

Determinants of firm performance are diverse in the literature. In fact, there is no generally accepted list of factors in explaining the firm performance (business success or failure in the words of Lussier, 1995). Traditionally, many arguments to explain factors that influence firm performance lie in the structure-conduct-performance (SCP) framework. This framework argues that firm performance is determined by the conduct of firms in the market, which is in turn influenced by the structure of the market (Ferguson, 1993). Within the SCP tradition, Rogers (2000) asserts that the higher the levels of industry or market concentration and a firm's market share, the higher the profitability would be or *vice versa*.

Recently, many factors have been found to relate to firm performance. Wengel and Rodriguez's (2006) study on the export performance of Indonesian SMEs, among others, included firm size and age as well as foreign share in the capital structure of the firm as their explanatory variables. Sarder et al. (1997) in their study on the performance of SMEs in Bangladesh used age of firm, management experience, initial investment, market competition, industry sector, and time elapsed after receiving financial support as moderating-independent variables. Wynarczyk and Watson (2005) in their study on SME sub-contractors in the United Kingdom employed size, age, ownership, supply chain characteristics, and partnership of firms as independent variables.

Recent studies in the strategic management area argue that firm-specific factors are more important than any other factors in determining firm performance (McGahan and Porter, 1997). Ownership structure as one of the firm-specific characteristics strongly influences firm performance. Following Douma et al. (2003), companies with foreign corporate shareholdings are endowed with superior advantages in various dimensions, including technological, marketing and managerial skills, *and hence, would give positive impact on firm performance*.

Brooksbank et al. (1992) in their examination of British medium-sized firms reveal that firms which give a higher priority to marketing than other business functions achieve higher performance. These firms use annual and longer-term marketing planning, perform market research, adopt a proactive approach in future planning, as well as employ market expansion strategies and clear approaches to manage marketing activities. Levitt (1983) and Kotler (1988) also stress that marketing is important for business success or performance.

Firm performance can be measured in many different ways. According to Dixon et al. (1990), performance measurements in the literature until the 1980s largely concentrated on financial indicators, such as profit, return on investment, sales per employee, and productivity. Commencing from the late 1980s onwards, less tangible and non-financial measures have been extensively employed in tandem with the advent of new management systems, such as supply chain management (SCM), just-in-time delivery (JIT), and total quality management (TQM). Intangible measures include communication, learning, trust (Saad and Patel, 2006), stakeholder satisfaction, competitive position (Garrigos-Simon et al., 2005), quality of product, and throughput rate (Abu Kasim et al., 1989).

Nevertheless, many empirical studies tend to employ tangible variables in measuring firm performance because they are easier to operationalise. Garrigos-Simon et al. (2005) in their study on Spanish hospitality firms adopted two tangible measures, which are profitability (return on assets, return on investment and return on sales) and growth (in sales, market share, and wealth creation); and two intangible measures, namely stakeholder satisfaction, and competitive position. McNamee et al. (1999) in their study on Irish small businesses used two performance measurements, which are, growth (in sales volume and employment) and profitability (return on assets, return on sales, profit per employee). A study by Powers and Hahn (2002) on the banking industry in New England only employed one indicator, return on assets (ROA), to compare the performance of 98 banks.

MODEL AND VARIABLES

With the focus on intra-firm performance, this study employs tangible performance measures as opposed to intangible measures. Subject to data availability, the performance indicators (the dependent variables) studied are turnover, market share and productivity. In fact, Abu Kasim et al. (1989) in their survey on the Malaysian manufacturing sector found that, irrespective of firm ownership or size, turnover (sales), market share and labour productivity are among the most commonly used performance measures. On the other hand, the independent variables examined were age, marketing, parts and foreign equity participation which were drawn from the literature as follows (Dobbs and Hamilton, 2007).

With respect to age, some studies found a negative relationship between this variable and firm performance (Wynarczyk and Watson, 2005; Wengel and Rodriguez, 2006) because young firms are relatively easier than the older ones to achieve a proportionate increase in scale (Storey et al., 1987). It is also argued that young firms tend to grow rapidly because they have innovative ideas and dynamic management (Wijewardena and Tibbits, 1999). This study however expects a positive relationship between age and firm performance in agreement with the study by Maes et al. (2005).

Table 1. Operationalization of the variables.

Variable	Measurement
Turnover	Sales in million ringgit (Malaysian currency)* in 2009.
Market Share	The share of each SME in total sales of the auto-parts industry.
Productivity	Turnover (as a proxy to production) in million ringgit per employee in 2009.
Age	Number of years of the firm from the start-up year to 2009.
Marketing	Number of buyers as proxy, including for the export market.
Parts	Types of auto-parts produced: 3 = critical parts; 2 = mixed parts; 1= standard parts.
Foreign participation (Frgn)	Based on equity ownership of foreign investors in an SME of ≥ 10 per cent: 1 = firm with foreign equity; 0 = otherwise.

* RM 3.20 = $USD 1.00.

Marketing is expected to be positively correlated with the performance of SMEs based on the arguments of Brooksbank et al. (1992), Levitt (1983) and Kotler (1988). The number of buyers is taken as a proxy to marketing because it is believed that intensive marketing efforts on the part of the SMEs would enable them to increase the number of buyers or extend the market base, including the export market. The model incorporates 'parts' as an explanatory variable because this factor would play a significant role in influencing firm performance. According to Hill and Lee (1994), there are two types of auto-parts. First, lower value parts (examples are brake linings, clutch and wire harnesses) are standardized parts and they require less sophisticated technology, skills and capital. Second, high value parts (such as transmissions, drive trains, electrical systems and engines) are more specialized parts, thus they need more advanced technology, skills and capital. Therefore, it is expected that the latter or critical parts derive higher price value than that of the former and hence it correlates positively with firm performance.

Pertinent to Frgn (foreign equity participation), it is expected that this factor has a positive relationship with the performance of SMEs, concomitant with the arguments or empirical findings of Douma et al. (2003) and Wengel and Rodriguez (2006). Based on a threshold used by OECD (1999), this paper considers that a particular SME has foreign equity participation when non-Malaysian residents have at least 10% ordinary shares or voting power in the firm.

Drawing from the literature, it is hypothesized that SMEs performance is significantly related to age, marketing, parts, and foreign equity participation (briefly, Frgn). Detailed operationalization of the variables is shown in Table 1.

DATA SOURCES AND ANALYSES

Data for this paper were collected from primary and secondary sources. The primary data were collected from the auto-parts manufacturers. In this connection, a sample frame was provided by Proton's Vendor Association. The total number of auto-parts manufacturers available was 124 out of which 53 or 42.7% were SMEs and 71 or 57.3% were large firms. A majority of the respondents were located in the Klang Valley (Kuala Lumpur and Selangor), the hub for automobile production. The classification of firm size was based on the definition adopted by the Third Industrial Master Plan (2006 to 2020) and the Small and Medium Development Corporation (SMIDEC), the main body responsible for developing SMEs in Malaysia. They define SMEs in the manufacturing, manufacturing-related services and agro-based industries as firms with full-time employees not exceeding 150 (Malaysia, 2006; http://www.smidec.gov.my). Mitra and Pinggali (1999) in their study on Indian automobile ancillary firms also refer to SMEs as those who had fewer than 150 employees.

The sample of auto-parts manufacturers used in this paper is considerably homogenous since they belong to the same size SMEs and were involved in the same auto-parts manufacturing industry. The focus on one firm category, such as SME could minimize sample bias since size also influence firm performance (Wynarczyk and Watson, 2005). For the purpose of this study, all the SMEs were surveyed using a structured questionnaire. This questionnaire was divided into two main parts. The first part consisted of questions relating to company demography, such as firm size, age of firm, location, and firm ownership. The second part contained questions pertinent to performance-related indicators, such as annual turnover, market share, number of employees (to validate the secondary data), market base, and types of auto-parts produced. As a strategy to ensure a full commitment from the respondents and simply to solicit most important information suited to the objective of this paper, the questionnaire was deliberately brief. This strategy worked well as all the targeted respondents returned the completed questionnaires.

Before the questionnaire was sent to each auto-parts manufacturer, a phone call was made to seek their agreement to participate in the survey and fix a date and time for a visit. Upon agreement, the questionnaire, together with a half-page request letter explaining the purpose of the study and assurance on the confidentiality of collected data was sent to each manufacturer either by hand, or facsimile. Most of the questionnaires were completed, either by the managing director, general manager, or production or operating manager. Some interviews were also carried out to get better understanding of the industry and firm performance. In the case where the questionnaire was not completed on the first visit, the firm was requested to complete the questionnaire within two weeks. Once the given time was due, the respondents were contacted again for another appointment to collect the distributed questionnaires. Some respondents returned the completed questionnaire by facsimile. Interestingly, all the respondents finally returned the completed questionnaires. The secondary data for annual turnover, market share, and number of employees were obtained or calculated from the information provided by Proton's Vendor Association, the Company Commission of

Table 2. Descriptive statistics of the sample.

Variable	Mean	Standard deviation	Minimum	Maximum
Turnover	27.07	43.12	3.00	82.90
Market share	0.52	0.84	0.10	5.50
Productivity	0.47	0.97	0.05	6.74
Age	16.89	7.36	5	46
Marketing	6.25	3.79	1	16
Parts	1.92	0.96	1	3
Frgn	0.48	0.51	0	1

The results are based on initial data; N = 53.

Table 3. Correlation matrices.

Variable	ln (turnover)	ln (market share)	ln (productivity)	ln (age)	ln (marketing)	Parts	Frgn
ln (turnover)	-	0.680**	0.675**	0.234	0.080	0.114	0.457**
ln (market share)	0.680**	-	0.595**	0.225	0.047	0.114	0.513**
ln (productivity)	0.675**	0.595**	-	0.005	-0.147	0.213	0.562**
ln (age)	0.234	0.225	0.005	-	0.108	-0.145	-0.073
ln (marketing)	0.080	0.047	-0.147	0.108	-	-0.002	-0.211
Parts	0.114	0.114	0.213	-0.145	-0.002	-	0.231
Frgn	0.457**	0.513**	0.562**	-0.073	-0.211	0.231	-

** Correlation is significant at the 0.01 level; N = 53.

Authority. These data were validated with the auto-parts manufacturers during the course of the survey.

Both descriptive and inferential analyses were adopted to analyze the data. Besides descriptive statistics, a standard multiple regression analysis was employed to examine the relationship between the specified independent and dependent variables. Using the Statistical Package for Social Science (SPSS) for windows, version 12.0, results of the estimation are presented and discussed in the following section.

EMPIRICAL RESULTS AND DISCUSSION

Table 2 shows the descriptive statistics of the sample on the dependent and independent variables. By and large, the turnover and the market share of the SMEs in the auto-parts market was rather small with a mean of RM 27.07 and 0.52 million respectively, compared with a mean of the industry of RM 80.05 and 1.55 million respectively (computed from the data provided by Proton's Vendor Association).

Based on the mean age, it could be concluded that most of the SMEs have long existed in the auto-parts industry. In terms of marketing and parts produced, it indicates that the SMEs could not depend on a single market (with mean marketing, 6.25) and a single product (with mean parts, 1.92) to survive in a small automobile market, such as Malaysia. This contradicts the common feature of the Japanese automobile industry in which its auto-parts manufacturers from a particular auto-maker group tend to depend on a single market or buyer because of their high loyalty to the group firm they belong to (Tabeta and Rahman, 1996). With respect to foreign equity participation, about half of the SMEs had foreign equity or ownership in the firms. After assessing for a normality assumption and test, all the three continuous dependent variables and the two continuous independent variables (age and marketing) needed a natural logarithmic transformation to overcome the strongly skewed data as recommended by Tabachnick and Fidell (2007). The results reported in Tables 3 and 4 are based on these transformed data. As displayed by

Table 4. Multiple regression results on SMEs performance.

Variable	ln (turnover)	ln (market share)	ln (productivity)
Constant	-0.032(-0.03)	-3.819(-4.25)**	-2.847(-3.05)**
ln (age)	0.683(2.19)*	0.650(2.24)*	0.164(0.55)
ln (marketing)	0.181(0.85)	0.149(0.75)	0.031(0.15)
Parts	0.043(0.31)	0.026(0.20)	0.167(1.24)
Frgn	1.005(3.75)**	1.077(4.32)**	1.064(4.12)**
Adjusted R^2	0.246	0.358	0.281
F-statistics	4.833**	5.988**	5.602**

* Significant at the 0.05 level; **Significant at the 0.01 level.

the correlation matrices in Table 3, the dependent variables are significantly positively correlated with one another. This, however, does not pose any statistical problems since the models were specified separately for the three dependent variables. Inter-relationships between the independent variables, on the other hand, are low and not significant. This indicates the absence of a multi-collinearity problem, which is good news for performing a multiple regression analysis. All the independent variables, except Frgn do not significantly correlate with the dependent variables at the 0.01 significant level. Table 4 demonstrates statistical results of the three performance models. An examination of the residual scatterplots for the three models shows that the assumptions of normality, linearity, homoscedasticity and independent residual are satisfactorily met. An inspection of the Mahalanobis distance values also indicates that there are no multivariate outliers among the independent variables for all the models since their values are not greater than or equal to the critical chi-square value of 18.47 at an alpha level of 0.001.

Based on Table 4, the age variable is consistent with the expectation that the performance of the SMEs tends to improve with increased longevity as against the normal case in small firm studies (Wynarczyk and Watson, 2005; Wengel and Rodriguez, 2006). This finding is not surprising since, unlike other small business industries, the auto-parts making industry requires high skills, knowledge, and expertise in meeting tight specifications and quality set by the buyer(s) or auto-maker(s). Longer-time auto-parts manufacturers in the Malaysian auto-parts industry are, in many cases, given special tasks to design and develop certain higher value-added auto-parts or components based on the concepts provided by the buyer (author's interview, 2008). All these advantages will be accumulated by the firms the longer they get involved in the industry, which in turn result in a positive impact on firm performance. The time factor to mature is well recognized by the Japanese auto-makers which prefer to keep existing suppliers on a long-term and stable basis because it is not easy to get new suppliers who can meet their design specifications and quality (Tabeta, 1995).

Contrary to early expectation, marketing and parts are not significantly related to the performance of SMEs. With respect to marketing, a high dependency of the SMEs on a particular buyer, namely PROTON (Perusahaan Otomobil Nasional Berhad, the first national auto-maker company initiated by the Malaysian government) may contribute to its insignificant relationship with firm performance. As shown in Table 2, the mean marketing (market base or number of buyers) is six (6) which shows that the respondents have been able to diversify their market base. It is, however, believed that a significant proportion of their sales went to the key buyer, PROTON. This belief is consolidated by the fact that most of the respondents were original equipment manufacturers (OEMs) of PROTON. As admitted by some respondents, they paid less attention to marketing, as other aspects of production such as quality, quantity ordered, and on-time-delivery were more important to them to satisfy the existing buyer(s) (author's interview, 2004). This finding is also consistent with Mitra and Pinggali's (1999) study that consumer base (marketing) is not important. They argue that the resource mature firms ancillarized to parent firms in the automobile industry, instead of having a wider customer base, chose to grow in step with the parent rather than to seriously diversify, either their products or customers.

Most interestingly, the coefficients of Frgn for all the estimated models are highly significant at the 0.01 level with positive signs. This finding confirms the earlier expectation and is consistent with studies elsewhere (Wengel and Rodriguez, 2006). There are at least two factors which could explain this positive impact of foreign equity participation (Frgn) on the performance of SMEs. First, industrial activities are rather new to Malaysians (local people) as this sector was not encouraged by the British colonials. Industrialization was promoted only after Malaysia gained her Independence in 1957. However, until recently, the locals preferred to participate or invest in low technology, resource-based industries, such as food, wood and wood-based, furniture and fixtures, and rubber and rubber-based sub-industries (Malaysia, 2006) because they are more familiar and comfortable to be involved in these indigenous industries. With respect to

the non-resource-based auto-parts making industry, the involvement of the local firms is even much later. It only started when the government-backed national automobile project was launched in the mid-1980s. In contrast, foreigners (in this context, the Japanese) have had about a century of experience in the automobile industry in general and auto-parts making industry in particular, i.e. since the first Japanese firm (Tokyo Motor Vehicle Manufacturing) started to manufacture automobiles in 1904 (Miyakawa, 1991).

Secondly, without foreign equity participation in the firm, local entrepreneurs with little experience and skills in auto-parts making would not be able to perform well. The same experience also faces locally-owned firms in other developing countries. According to Saad and Patel (2006), despite a high level of tariffs imposed on imported components, Indian or local suppliers still have a limited level of technological capability, poor product quality and lack of reliability on parts delivery.

On the contrary, with foreign equity ownership, the firm would perform better. As foreign firms have superior intangible assets (Chiao and Yang, 2011), foreign-local partnership would enable local SMEs in the industry to tap specialized technical and managerial resources owned by their foreign counterparts. Undeniably, technology transfers, besides joint ventures, could be obtained through many other means, such as technical assistance, licenses and patents, and purchases.

However, it is believed that local-foreign joint ventures are the most effective way for transferring technology from foreign to local partners. Anazawa (1997) agrees that auto-parts suppliers in Malaysia with foreign equity participation tend to get easy access into managerial and technical resources of the parent companies. When foreigners have equity in a firm, only then would they be eager to transfer a package of required assets, including technological, marketing and managerial skills (superior advantages as identified by Douma et al. 2003) to the local partners. The reported increase in ownership or management control by foreigners in Korean auto-suppliers after the financial crisis at the end of the 1990s (KARI, 2002) is a testimony to why some Korean suppliers have achieved the status of global suppliers.

Recent changes in PROTON's strategy in terms of components sourcing should be the utmost concern for locally-owned auto-parts manufacturers. Instead of depending on single sourcing and giving priority to local suppliers, with the adoption of the modular system, PROTON has turned to dual sourcing and global auto-parts suppliers (Tham, 2004) as one of the crucial strategies in cost-cutting initiatives and improving competitiveness in the market. Adding to this development, with increasingly intense competition brought about by the globalization process, local auto-parts SMEs with no foreign equity need to consolidate their network relations with foreign counterparts, especially through equity ownership. The SMEs could use their long-established contacts with foreign technology suppliers to seek for foreign joint-venture partners who are able to improve their firm performance.

CONCLUSION

This paper examines the determinants of SME performance in the auto-parts industry in Malaysia. Three multiple regression models were specified and estimated to examine the relationship between the three dependent variables - turnover, market share, and productivity- each with four independent variables, namely age, marketing, parts, and foreign equity participation. The results, as expected, indicate positive relationships between the specified dependent and independent variables. However, only two variables - age and Frgn - are significantly related to the performance of SMEs. This consolidates the earlier expectations and studies that age and foreign ownership do matter to the performance of SMEs.

The findings presented in this paper are consistent with the strategic management literature that firm-specific factors are more important than any other factors in determining firm performance, but not with the traditional SCP approach which premises on market structure. While age factor is difficult to be controlled by SMEs because it requires time to reach a mature or experienced stage, the foreign resources could be dealt with in a more flexible manner. As the local SMEs are new to and less experienced in auto-parts making, they should not try to maintain a national-firm ownership status, but have to conclude joint ventures with foreigners in order to achieve better performance and more importantly to compete in the growing open market mechanisms today.

Further, research should identify any specific role played by foreigners, who are responsible for improving SME performance. Future studies should also incorporate intangible performance measures, such as customer satisfaction, competitive position and quality of product as these factors become more important in the context of global production networks organized by global auto-makers as well as global competition brought about by the recent World Trade Organisation (WTO), regional, and bilateral free trade (FTA) agreements.

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