

**FORMULATING POLICIES FOR ROBUST SME DEVELOPMENT: SCHUMPETER-  
ARROW-INVERTED U DEBATE - EVIDENCE FROM MALAYSIAN SMEs**

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## Abstract

Malaysian SMEs (small and medium scale enterprises) represented ninety-nine percent of business establishments in Malaysia in 2003, employing over three million workers and creating a value-added volume of RM 54 billion. The 9<sup>th</sup> Malaysia Plan (2006 – 2010) strives for the development of a competitive, innovative and technologically strong SME sector, capable of meeting the increasing demands of globalization and intensifying competition. Various governmental support mechanisms have been set in place to realise these objectives. In general, these broad strokes of overall policy are designed to awaken the SME industries as a whole. SMEs are divided into micro, small and medium enterprises. This paper takes the position that there are differences in labour productivity in the different types of firms within various sub sectors, even amongst homogenous businesses, such as within the manufacturing sub sectors. This study explores the differences in labour productivity amongst micro, small and medium scale industries in the manufacturing sub sectors, as well as amongst firms of increasing sizes in the overall manufacturing sector. It finds that larger firms are not always more productive than their smaller counterparts, and suggests that policies that simply drive growth may not be suitable for all sectors. The policy recommendations provided in this study, based on a case study of Malaysia, can also help other developing nations to create robust SME sectors, for combating poverty and uplifting the general economic well being.

Keywords: SMEs in developing nations, labour productivity, SME consultants, SME policies, SME development.

## 1.0 Introduction

SMEs (small and medium scale enterprises) are major sources of new jobs, technological and economic development and promoters of entrepreneurs (Acs, 1992; Liargovas, 1998; Haron, 2001, Korsching and Allen, 2004; Muske, Woods, Swinney and Khoo, 2007). They are able to play an important role in fighting poverty in developing countries (Morris, Woodworth and Hiatt, 2006).

A criticism of SMEs is that their small size prevents them from taking advantage of economies of scale. However, studies in Europe have indicated that linkages and cooperative arrangements within the SME sector are able to provide business models that replicate the advantages of economies of scale, while maintaining flexibility and responsiveness that is essential for success (Piore & Sable, 1984; Pyke, Becattini & Sengenberger, 1990; Pyke & Sengenberger, 1992).

SMEs play an important role in Malaysia. They contribute to expanding output, provide value-added services in manufacturing, create employment and help to broaden the nation's export base (UNDP, 2007). They represented ninety-nine percent of business establishments in Malaysia in 2003, employing over three million workers and creating a value-added volume of RM 54 billion (Census, 2005). The 9<sup>th</sup> Malaysia Plan (2006 – 2010) strives for the development of a competitive, innovative and technologically strong SME sector, capable of meeting the increasing demands of globalization and intensifying competition.

While empirical studies are available on various success factors for SMEs (such as characteristics of owners and managers), there is limited empirical research in other areas (Osman & Hashim, 2003), including studies pertaining to wider policy directions, particularly in developing nations. A recent study by Saleh and Ndubisi (2006) is one of the very rare papers that address SME related Malaysian governmental policies. Empirical studies on the overall strategic direction of these initiatives, that offer insights on the appropriateness of overall policy directions, designed to help Malaysia and other

developing nations to build strong, resilient SMEs, are virtually non-existent. The current study addresses this gap in the literature.

Current government initiatives for SME development generally support the growth of SMEs into larger enterprises. This perspective is informed by the theoretical viewpoint of Schumpeter (1942), that larger businesses are likely to be more productive. Monopolies (which result in larger businesses) tend to have more resources at their disposal for investing in activities such as research and development (R&D), which in turn give rise to innovations and reduce market uncertainties. *Ceteris paribus*, this perspective indicates that public policies that strive to support and build big businesses would spur innovation and productivity.

However, the alternative theoretical perspective of Arrow (1962) contends that smaller businesses are more productive. In the presence of competition (such as when a number of smaller firms are competing with each other), the monopolist tends to lose out in innovating, since the rents extracted by maintaining the monopoly power exceeds the benefits of the lower prices brought about by innovation. However, smaller firms will be able to benefit by innovating under these conditions, because the lower prices and costs resulting from innovation leads to competitive advantages in the marketplace. In contrast to Schumpeter (1942), this perspective suggests that policy makers should support competition and smaller firms, which would in turn spur innovation and productivity.

Extant literature offers mixed support for these competing viewpoints (Felisberto, 2008; Sharpe and Currie, 2008). For instance, Romer (1990) and Grossman and Helpman (1991) support Schumpeter (1942), maintaining that monopolies tend to innovate since they can profit from their monopolistic positions. On the other hand, Nickell (1996) and Boone and Dijk (1998) argue for Arrow (1962), that is, competition has a positive impact on innovation. Relatively recent work (Blundell et al., 1999; Cellini and Lambertini, 2005) offers that competition has a positive impact on aggregate innovation (or R&D investment) and a negative impact on individual innovation.

A third viewpoint integrates these perspectives, indicating an inverted U-shaped relationship between competition and innovation (Scherer, 1967; Aghion et al., 2005). This perspective suggests that competition has a positive impact on innovation up to a certain point. Excessive competition beyond this point has a negative impact on innovation. Intuitively, excess competition may result in a large number of smaller firms that may be resource constrained. Such resource constraints may impact innovation negatively.

There are practically no studies that explore the Schumpeter-Arrow-inverted “U” debate in the Malaysian context. Such a study would be very useful for policy makers, especially in developing policies designed to uplift SMEs and boost innovation and productivity. If the Schumpeterian perspective is descriptive of the Malaysian context, then policymakers would be well advised to favour policies that drive growth. However, if the viewpoints of Arrow or the inverted “U” concepts are applicable to SMEs in Malaysia, rather than the Schumpeterian perspective, then policies that blindly drive growth should give way to more flexible systems that help to maintain and support competition and SMEs of different sizes, in the interests of promoting innovation.

This paper undertakes an empirical investigation to determine which of these competing theories are applicable to SMEs in the Malaysian manufacturing sub sector. Its objective is to determine whether firm size is positively associated with productivity, that is, whether the Schumpeterian perspective holds true for Malaysian SMEs in all economic sub-sectors. It employs labour productivity as a proxy for innovation.

The results indicate that the Schumpeterian perspective does not hold for all economic sub-sectors. In some sub-sectors, smaller firms are more productive, supporting Arrow's (1962) ideas. And overall, the empirical data indicates the presence of the inverted U relationship.

As such, “one-size-fits-all” policies that generally promote growth may be less relevant for Malaysian SMEs, as compared with a flexible system that supports different SMEs according to their particular circumstances.

The rest of this paper is organized as follows. Section 2 discusses current challenges faced by Malaysian SMEs and the institutions that collectively address these challenges. Section 3 covers an empirical study of labour productivity in the manufacturing sub sectors, in micro, small and medium scale industries. Section 4 offers policy recommendations. Section 5 discusses limitations and offers directions for future research. The final part concludes.

## 2.0 Definitions, current challenges and the governmental support framework for SMEs

### 2.1 Definitions of SMEs

Prior to 2005, there were different definitions for SMEs even within the different government departments in Malaysia (UNDP, 2007). For instance, the Small and Medium Scale Industries Development Corporation (SMIDEC) used to define SMEs as establishments with annual sales below RM25 million and less than 150 full time employees. In contrast, Bank Negara Malaysia <sup>1</sup> defined SMEs based on shareholders funds of less than RM10 million.

However, the definition of SMEs across all agencies in Malaysia is now standardised, following the release of relevant guidelines in September, 2005. This standardised guideline for SMEs is shown in Table 1 (Appendix 1).

Due to the different SME definitions across nations, cross country comparisons based on published reports are difficult to interpret. In essence, any differences in such comparisons may reflect different definitions rather than actual underlying trends. For the same reasons, time series comparisons between current statistics based on the

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<sup>1</sup> Central Bank of Malaysia

new definition and statistics from periods prior to 2005, based on different definitions, are also problematic. As such, the empirical part of this study principally focuses on data within the manufacturing sectors and sub sectors that employ standard sector wide definitions, so the results are comparable within the sub sectors.

## 2.2 Challenges faced by SMEs and governmental support

In government reports and published literature, key challenges for Malaysian SMEs have been identified as limited access to advisory services, limited marketing and promotion strategies, limited access to local and global markets, constraints imposed by management and technological capabilities, low value added and uncompetitive processes, a lack of training, limited research and development capabilities and difficulties in obtaining financing (National SME Development Council, 2006; Saleh & Ndubisi, 2006).

An array of governmental organizations is in place to address these issues. The Malaysian Technology Development Corporation (MTDC), the Multimedia Development Corporation (MDC), the Ministry of Science and Technology and the SMIDEC help Malaysian SMEs in technology acquisition, customization, deployment and development.

The issues of market and trade intelligence and market development are addressed through the services of various institutions such as the Ministry of International Trade and Industry (MITI), Malaysia's External Trade Development Corporation (MARTRADE) and the Farmers Association Marketing Authority (FAMA). Furthermore, advisory services pertaining to capacity development, including productivity, quality, production and business process improvements, as well as building awareness of export options, are dispensed via another set of institutions, including SMIDEC, MARTRADE, Majlis Amanah Rakyat (MARA), the Ministry of Entrepreneur and Co-operative Development, the Ministry of Agriculture and the Construction Industry Development Board.

The general lack of access to financing is to be overcome via several institutions, such as various financial and developmental institutions, the Credit Guarantee Corporation, commercial banks, venture capitalists and various ministries and agencies.

The large, intricate array of government departments, agencies and ministries involved in helping out the SMEs assumes that SMEs have the time and resources to research and successfully navigate their way through the complexity. In short, this system helps the larger establishments that are more likely to have such excess resources. If an empirical investigation of SMEs finds that the productivity associated with larger enterprises is consistently greater than that attributable to smaller enterprises, then this system, which appears to favour larger enterprises may be justified, at least to a certain extent. However, if larger enterprises are not always associated with higher productivity, then policy makers need to consider alternative SME support systems that explicitly consider the resource constraints of smaller SMEs.

The next section covers this empirical exercise, based on data from a publicly available source, the Census of Establishments and Enterprises (Census, 2005). This empirical research's objective is to explore the relationship between firm size and productivity in Malaysian SMEs, in the manufacturing sector as well as across related sub sectors.

### 3.0 A labour productivity analysis

Labour productivity is defined as output divided by the number of workers employed or value added divided by the number of workers employed. The data pertaining to output, value added and number of workers employed are readily available to the public, in the form of the published Census of Establishments and Enterprises (Census, 2005). This publication provides detailed profiles of the small and medium scale enterprises, and provides all the required output broken down by industry sub sector and firm type. One limitation of this database is that it is based on data pertaining to a single year, 2003. As such, it is not possible to conduct time series analyses, which might provide additional



insights. However, the purpose of this study is to explore the labour productivity of SMEs of different sizes. And the data from Census (2005) is sufficient for this purpose. This analysis explores whether productivity always increases with firm size across various manufacturing sub-sectors, that is, whether the Schumpeterian (1942) viewpoint always holds true, which in turn would shed light on the appropriateness of public policies that generally focus on helping the larger SMEs.

### 3.1 Data and Methodology

This paper explores the relationship between innovation and firm size, and examines whether the perspective of Schumpeter, Arrow or the inverted U is supported by empirical evidence based on Malaysian SMEs. The Schumpeterian viewpoint indicates that larger firms are likely to be more innovative, while Arrow posits that smaller firms are likely to be more innovative. The inverted U perspective predicts an increase in innovation with firm size up to a point, after which innovation drops.

As Ahn (2002, p. 13) points out, "In empirical studies exploring links between market structure and innovation, measuring innovation is ... difficult". Past research has employed inputs that potentially drive innovation, such as research and development (R&D) data, as well as outputs that are the results of innovation, such as data on patents, as proxies for innovation (Cohen and Levin, 1989; Griliches, 1990). Both the input and output based proxies have their limitations. For instance, various types of R&D expenditure may not really reflect the degree of innovation in a firm, since only a portion of the R&D may produce innovations. As such, R&D expenditures may overestimate innovations. And when firms do not patent their innovations<sup>2</sup>, the data on patents may underestimate the innovations in a firm.

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<sup>2</sup> Firms may choose not to patent, in order to protect trade secrets, such as the formula for Coca Cola (Thompson, 2007)

Scarpetta et al. (2000) indicates a general positive relationship between R&D intensity and growth of labour productivity. Higher productivity can be considered to be an output of innovation (Monthly Labour Review, 2008). Moreover, Felisberto (2008) reports that labour productivity, used as a proxy for innovation, provides conclusions similar to that provided by various alternative measures of innovation, which were based on survey data. Assuming that innovations improve labour productivity; this proxy is relatively free of the overestimation and higher estimation bias of R&D and patent data. Thus, labour productivity may be considered as a suitable proxy for innovation, and it is used as such in this study.

Labour productivity may be defined as output per worker<sup>3</sup> or value added per worker. Value added is defined as output less input. Output per worker reflects the total value of the products of the firm. However, part of this value comes from various inputs, to which the firm adds value that is finally reflected in the total output. Value added per worker considers the portion that is added by the various processes in the firm, which result in the final value of the finished product; it may be considered as a stricter measure of the actual contribution of the firm to the final value of the finished product. Both of these measures of labour productivity are used in this study. When the results from using these different measures generally concur, there is greater assurance that the study has been able to correctly elicit the underlying trends. However, if the results from the different measures should be in disagreement, then there is some possibility that the results reflect the peculiarities of the constructs used as proxies for the variables of interest, rather than the actual underlying trends. In such cases, the potential weaknesses of the proxies will be revealed. In this study, both of these measures lead to generally similar conclusions.

The Census of Establishments and Enterprises (Census, 2005), covers three key sectors, namely, manufacturing, services and agriculture. The census is based on 552,804 completed responses that resulted from the mailing of questions to 1.7 million

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<sup>3</sup> Labour productivity is measured either as output per hour or output per worker (CSLS, 1998). The latter definition is employed because Census (2005) does not provide information on hours worked. Felisberto (2008), for example, employs a similar definition.

businesses (including entrepreneurs) in March 2005. The census frame principally consists of the firms recorded by the Companies Commission of Malaysia, supplemented by matched and updated information based on records at the Central Registry of the Department of Statistics, Employees Provident Fund, Inland Revenue Board, Ministry of Agriculture and Agro-based industries and businesses registered with local authorities and related governmental agencies. Of the 552,804 responses, 99.2 percent represented SMEs. This very high percentage is consistent with similar data from elsewhere (for example, the percentage of SMEs amongst all business establishments are also above 99 percent for Thailand, the Philippines and Indonesia).

For the purposes of this census, manufacturing is defined as:

“Physical or chemical transformation of materials or components into new products, whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the worker’s home, and whether the products are sold at wholesale or retail” (Census, 2005, pp. 56).

The following study is based on the analysis of the data from this census. The census reports data on output (in millions of ringgit), input (in millions of ringgit) and the numbers of persons employed, broken down by employment size group. This employment size group is given in seven classes, namely, below 5, between 5 and 9, between 10 and 19, between 20 and 29, between 30 and 49, between 50 and 99 and above 100. This employment size group data, published in aggregate for the entire manufacturing sub-sector, was employed in the overall analysis of the relationship of the productivity of Malaysian SMEs in the manufacturing sub-sector (Appendix 2).

The census also provides information on output, value added and persons employed for several manufacturing sub-sectors, within the manufacturing sector. This detailed data was employed for a finer, sub-sector level analysis (Appendix 3).

This study focuses on just the manufacturing sector for several reasons. For one, the manufacturing sub sectors tend to be relatively homogenous (as compared with, for

example, the service sub sectors); as such the findings from the study can be taken to be applicable across the specific sub sector. Besides, the manufacturing sector is becoming increasingly important in developing nations, providing opportunities for import substitution and propelling domestic economic growth. Thus the manufacturing sector is a good area of focus for a study of the appropriate public policies for boosting innovation and productivity.

The output and value added (taken from Census, 2005) were divided by the total number of employees (as at December or the last pay period of 2003), for businesses of different sizes, (Chart 1, Appendix 2) and sub sectors (Table 2, Appendix 3).

Output is defined as “income from sale of products plus the value of goods sold in the same condition as purchased plus other operating income less opening stocks (includes raw materials, fuels, supplies, packing materials, goods in process and finished goods (self manufactured)) plus closing stocks (includes raw materials, fuels, supplies, packing materials, goods in process and finished goods (self manufactured))” (Census, 2005, pp. 59-60).

Input is defined as “value of purchased goods, materials and industrial services (includes materials used in processing, spare parts and other materials, payments for processing work done by others, import duty) plus cost of goods sold in the same condition as purchased plus electricity and water consumed” (Census, 2005, p. 60).

Value added is defined as the difference between output and input.

The total number of employees is the sum of full-time and part-time employees. Full-time employees are defined as “all paid workers who work for at least 6 hours per day and 20 days a month” (Census, 2005, p. 59). Part-time employees are defined as “all paid workers who work for less than 6 hours per day and/or less than 20 days per month” (Census, 2005, p. 59).

The overall results of this analysis are presented in Chart 1 and Table 2 (Appendices 2 and 3), respectively.

### 3.2 Results and analysis

The overall productivity versus firm size analysis, amongst SMEs in the manufacturing sector, is depicted in Chart 1 (Appendix 2). Both of the measures of productivity, namely, output per employee and value added per employee, indicate an overall inverted U shape, concurring with the viewpoints of Blundell et al. (1999) and Cellini and Lambertini, 2005.

Table 2 (Appendix 3) breaks down this analysis into finer levels, examining the effect of firm size on productivity across various manufacturing sub-sectors. Census (2005) provides information regarding numbers of employees, output and value added for micro, small and medium sized enterprises, broken down by the different manufacturing sub-sectors. This data was used to compute the output per employee (output divided by number of employees) and value added per employee (value added by number of employees).

The analysis of labour productivity across the manufacturing sub sectors confirms that differences in productivity occur amongst the different types of SMEs. In some cases, smaller firms do have a productivity advantage. The results for the manufacturing sub sectors are discussed and summarised in Figure 1 below, based on the analysis depicted in Table 2 (Appendix 3), and displayed graphically in Chart 2 to 4 (Appendices 4 to 6).

Generally, the larger firms appear to be more productive than the smaller ones in the following manufacturing sub-sectors: food products, textiles and clothing, wood products, paper and recorded media, chemical products, rubber and plastic, metal and

non-metallic mineral products, machinery and equipment n.e.c, electronics and other components, radio and TV receivers and associated products, radio and TV transmitters and associated products, motor vehicles and parts and accessories, and furniture.

The output per employee rises steadily from 0.013 to 0.026 to 0.114 for micro, small and medium scale firms, respectively, in the food products sub-sector. Likewise, the value added per employee rises from 0.0051 to 0.0055 to 0.019, respectively. The output per employee for the relatively larger medium scale firms is greater than the total output per employee of 0.056. Similarly, the value added per employee for the medium scale firms is greater than the total value added per employee of 0.01. The labour productivity in this sub sector clearly increases with firm size, offering support for the viewpoint of Schumpeter (1942).

A similar trend is discerned in the textiles and clothing sub-sector. The output per employee again rises with firm size, from 0.056 to 0.061 to 0.098 in the micro, small and medium scale enterprises, respectively. The value added per employee also rises with firm size, from 0.0258 to 0.0269 to 0.038, respectively. The output per employee and the value added per employee for the medium scale enterprises are greater than the corresponding total values for all firms, which are 0.068 and 0.029, respectively. The largest firms appear to be more productive than the smaller enterprises in this subsector, providing support for the Schumpeterian viewpoint.

In the wood products sub sector, the output per employee dips<sup>4</sup> from 0.12 for micro enterprises to 0.10 for small enterprises, and then rises to 0.13 for medium scale enterprises. The value added per employee, however, rises slightly from 0.032 for micro enterprises to 0.033 for small enterprises, and jumps to 0.045 for medium scale enterprises. Just like in the two sub sectors discussed above, the productivity of the larger medium scale firms exceeds the overall output per employee and value added

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<sup>4</sup> When a U-shaped relationship occurs, the overall output per employee and the value-added per employee are compared with that of medium scale enterprises. When the medium scale enterprises indicate higher productivity values than the overall totals (which are averages for all of the firms in the sub sector), the Schumpeterian perspective is supported, since it indicates that the larger firms have higher productivity than the overall averages. Furthermore, in all of these cases, the medium scale firms also indicate higher productivity than micro firms.

per employee of 0.115 and 0.037, respectively. Thus, again the Schumpeterian viewpoint appears to hold in general in this sub sector, with the largest firms being more productive overall than the smaller ones.

In the paper and recorded media sub sector, the output per employee increases with firm size, at 0.08, 0.11 and 0.20 respectively for micro, small and medium scale enterprises. The value added per employee also increases with firm size, at 0.037, 0.04 and 0.07 respectively. The medium sized firms have higher output per employee and value added per employee than the overall values of 0.13 and 0.05, respectively. The largest firms are thus more productive than the smaller enterprises, supporting the perspective of Schumpeter.

Interestingly, in the petroleum products sub sector, the data indicates an inverted U shaped relationship between productivity and firm size. The output per employee rises from 0.14 in the micro enterprises to 8.87 in the small enterprises, and then falls to 5.88 in the medium scale businesses. Similarly, value added per employee increases from 0.03 in micro enterprises to 3.64 in small enterprises, and then drops to 3.14 in medium scale enterprises. The small scale enterprises register higher values of labour productivity than the overall values of 7.33 for output per employee and 3.28 for value added per employee. Thus, in this sector, an inverted U-shaped relationship is discerned between labour productivity and firm size. These results are depicted graphically in Chart 4 (Appendix 6).

In the chemical products sub sector, the output per employee for micro, small and medium enterprises rises with firm size, at values of 0.17, 0.23 and 0.63 respectively. A similar trend is apparent in value added per employee, at 0.06, 0.07 and 0.19 respectively. The output per employee and value added per employee for the medium scale enterprises exceed to overall totals of 0.42 and 0.13 respectively. Thus, the Schumpeterian perspective holds true in this sub sector.

In the rubber and plastic products sub sector, the output per employee dips from 0.13 in the micro enterprises to 0.12 in the small enterprises to 0.29 in the medium scale businesses. Similarly, the value added per employee dips from 0.0397 to 0.0383, and then rises to 0.0799. However, the output per employee and the value added per employee for the medium scale enterprises exceed the overall values of 0.19 and 0.06, respectively. Therefore, the larger enterprises are more productive than the smaller ones in this sub sector, supporting the Schumpeterian perspective.

The output per employee increases with firm size in the metallic, non-metallic mineral products sub sector, with values of 0.09, 0.13 and 0.31 in micro, small and medium scale enterprises respectively. The value added per employee indicates a similar trend, with values of 0.038, 0.045 and 0.094 respectively. The output per employee and value added per employee for the medium scale enterprises also exceed the corresponding values for the entire sub sector, which are 0.15 and 0.06 respectively. As such, the firm size-labour productivity relationship in this sub sector follows the Schumpeterian perspective.

The labour productivity increases with firm size in the machinery and equipment sub sector as well, with output per employee values of 0.09, 0.11 and 0.28 for micro, small and medium enterprises, respectively. The value added per employee further confirms this trend for this sub sector, with values of 0.04, 0.05 and 0.09 respectively. The overall sub sector values for output per employee (0.15) and value added per employee (0.06) are lower than the corresponding values for the medium scale enterprises. Thus, this sub sector provides support for Schumpeter (1942).

The electronics sub sector records output per employee of 0.04, 0.07 and 0.12 respectively for micro, small and medium scale enterprises. The value added per employee in this sub sector also follows a similar trend of the productivity increasing with firm size, with values of 0.02, 0.03 and 0.04 respectively. Moreover, the medium scale firms register a higher output per employee and value added per employee figures



than the corresponding overall values of 0.09 and 0.03 for the electronics sub sector. The productivity-firm size relationship thus follows the Schumpeterian perspective.

In the radio and TV transmitters sub sector, the output per employee dips from 0.15 in micro enterprises to 0.07 in small enterprises, and increases to 0.18 in medium enterprises. The value added per employee follows a similar trend, dropping from 0.04 in micro enterprises to 0.03 in small enterprises and then rising to 0.05 in medium scale enterprises. The output per employee and value added per employee of medium scale enterprises are both greater than the corresponding values of 0.12 and 0.04, respectively, for the entire sub sector.

The output per employee in the radio and TV receivers subsector rises with firm size, registering values of 0.07, 0.10 and 0.15 for micro, small and medium scale enterprises, respectively. The value added per employee dips from 0.04 in micro enterprises to 0.03 in small enterprises to 0.05 in medium scale businesses. Nevertheless, the output per employee and the value added per employee figures for the medium scale businesses exceed the corresponding values of 0.12 and 0.04 for the overall sub sector, supporting the Schumpeterian perspective.

A similar trend is evident in the motor vehicles sub sector. The output per employee rises from 0.147 in micro enterprises to 0.15 in small firms to 0.24 in the medium scale enterprises. The value added per employee, however, decreases from 0.06 in micro enterprises to 0.05 in small enterprises, and then rises to 0.08 in medium scale enterprises. The overall sub sector's output per employee (0.19) and value added per employee (0.06) are below corresponding values for the medium scale enterprises. As such, the data from this sub sector supports the Schumpeterian perspective.

In the furniture sub sector, the output per employee decreases from 0.078 in micro enterprises to 0.073 in small enterprises, and then increases to 0.102 in medium scale enterprises. The value added per employee indicates a similar trend, dipping from 0.02997 in micro organizations to 0.025781 in small enterprises, and then rising to

0.0338 in medium enterprises. But the output per employee and value added per employee in medium scale enterprise exceed the overall sub sector values of 0.08 and 0.03 respectively. The evidence from this sub sector, thus, supports the Schumpeterian viewpoint. These results are summarised in Table 1.

**FIGURE 1: MALAYSIAN SMES IN MANUFACTURING SUB SECTORS:  
A LABOUR PRODUCTIVITY ANALYSIS**

| <b>Type of business that has productivity advantage</b> | <b>Sub sector</b>   | <b>Remarks/Analysis</b>   |
|---|---|---|
| Medium  | Food products, textiles and clothing, wood products, paper and recorded media, chemical products, rubber and plastic, metal and non-metallic mineral products, machinery and equipment n.e.c, electronics and other components, radio and TV receivers and associated products, radio and TV transmitters and associated products, motor vehicles and parts and accessories, furniture. | Medium scale businesses indicate greater labour productivity. The Schumpeterian viewpoint is supported here; growth strategies are likely to improve productivity.  |
| Small   | Petroleum products  | Small scale enterprises appear to have an advantage in labour productivity. Labour productivity and firm size have an inverted U shaped relationship. Strategies that promote nimbleness and flexibility, rather than size, such as by promoting ICT technology adoption, are likely to be more effective in boosting productivity. |

|         |                                  |  |
|---------|----------------------------------|--|
| General | The overall manufacturing sector | Characterised by a non-linear, inverted U shaped relationship between labour productivity and firm size. Overall, general policies and strategies that promote nimbleness and flexibility, rather than size, such as by promoting ICT technology adoption, are likely to be more effective in boosting productivity. |
|---------|----------------------------------|--|

In a majority of the sub sectors, the data follows the Schumpeterian perspective, wherein the larger enterprises indicate greater productivity. However, there are notable exceptions where the inverted U explanation holds, and smaller sizes do appear to offer some advantages. For example, in petroleum products, the small enterprises indicate higher output per employee than the larger medium scale enterprises. Thus, in this sub sector, the smaller business enterprises have a productivity advantage. Furthermore, the product-firm size analysis involving the entire manufacturing sector indicates an inverted U shaped relationship.

At first sight, there appears to be some conflict between the observations in Chart 1 (Appendix 2), and Charts 2, 3 and 4 (Appendices 4, 5 and 6). Chart 1 indicates an inverted U-shaped relationship, based on the overall data in the manufacturing sub sector, between labour productivity and firm size. However, Charts 2 to 4 indicate a Schumpeterian relationship in virtually all of the manufacturing sub sectors, except for petroleum products. This apparent contradiction is resolved when one considers that the descending arm of the inverted U in Chart 1 generally commences only beyond the 30-49 and 50-99 class sizes. Since the micro, small and medium scale sub-divisions capture only class sizes of below 5, 5 to 50 and above 51 (based on the definitions in Table 1, Appendix 1), the data based on these firm sizes relate to mainly the ascending arms of the inverted U curves shown in Chart 1 (Appendix 2). And these ascending

arms indicate that generally labour productivity rises with firm size, concurring with the general conclusions in the sub sector level analysis.

In summary, the medium size enterprises do appear to have a productivity advantage over relatively smaller organizations in the vast majority of manufacturing sub sectors. However, a finer analysis (Chart 1, Appendix 1), that includes an analysis of labour productivity within the medium scale enterprises of increasing sizes, reveals a drop in overall labour productivity as firm size increases from 50 employees to over 100. Therefore, policies that support SMEs of different sizes are likely to be more beneficial in spurring overall innovation and labour productivity, as compared with policies that predominantly focus on growth and creation of very large enterprises.

#### 4.0 Policies and recommendations

The overall findings support the view of Scherer (1992, pp. 1422-3) that "... the weight of the existing statistical evidence goes against Schumpeter's 1942 argument that large corporations are particularly powerful engines of technological innovation...". In essence, this empirical study indicates that Malaysian SMEs are best served by a flexible public policy approach that seeks to offer support for SMEs of all sizes, rather than focusing predominantly on assisting large SMEs, to boost innovation and productivity. Several policy recommendations are outlined below based on this insight.

National level policy makers should put together an enabling environment that offers support for all SMEs regardless of size. As such, viable options include government funded nationwide one-stop SME advisory centres staffed by trained SME consultants. These consultants could record the specific needs of each SME that approaches them for help, make a quick assessment of their viability and contact the relevant supporting government departments as necessary. In essence, these consultants will help viable SMEs to get necessary aid and support without undue hassle and expense, to be able to survive and sustain their businesses.

The government can also enlist the help of private consultants, including small scale accounting and consulting firms. Pertinent steps could include a support unit within the SME policy making body for privately funded small-scale consultants. This unit could invite such consultants to join a board that considers how these consultants can best complement national efforts. The consultants who join this board can be asked for input on future policies, and to contribute white papers on specific issues. Small scale consultants in the SME sector may also form their own association and work collaboratively through this association. This association should provide a database of consultants who have expertise in various fields, act as a reference point for SMEs seeking advisory services and offer mutually beneficial networking opportunities.

The SMEs should capitalise expenditures related to training and staff development, which provide long-term benefits, in its management reports and internal records (Flamholtz, 1999). Human capital values can be measured via the human resource cost and human resource value approaches (Sackman, Flamholtz and Bullen, 1989). The former includes the historical cost (Brummet, Flamholtz and Pyle, 1968), replacement cost (Flamholtz, Searfoss & Coff, 1988) and opportunity cost (Hekimian and Jones, 1967) methods. In contrast, the latter is represented by models that employ monetary data or non-monetary data, or both (Sackmann et al., 1989). In essence, the cost approaches look at the expenditure incurred in developing the human capital, while the value approaches record the worth of the human capital to the firm. In general, firms would invest in human capital development expenditure with the intent of obtaining benefits that far outweigh the cost outlays. As such, cost based approaches are likely to understate the human capital values. Furthermore, the knowledge of the worth of the current human capital to a firm is more useful than just an idea of what it costs to build this capital; in the event that the costs incurred do not lead to an actual improvement in human capital, the cost approaches may actually overstate the human capital in the firm. As such, the value based approaches are better suited for recording human capital and monitoring the development and build up of pertinent skill bases in the SMEs. This will help keep track of the firm's human capital and bring attention quickly to indicators of future problems, such as, for example, a sudden drop in human capital values due to obsolescence.

## 5.0 Limitations and future research

This data is based only on the year 2003<sup>5</sup>. The empirical analysis assumes that the trends observed for 2003 will hold true over time. A time series analysis, based on data that will become available in the future as more survey data is published, will help to validate this assumption. It will also help to indicate changes, if any, in the labour productivities of different business types amongst the different sub sectors.

The denominator for computing the labour productivity is the total number of employees on the payroll as at December or the last pay period of the year 2003. This is the sum of the part-time and full time staff at this point of time. The use of full time equivalent staff numbers (the total number of working hours contributed by the employees over the year divided by the number of hours attributable to each full time employee for the year) would provide a more accurate assessment. However, this information is not available in Census 2005. As such, there could be some overestimations of the denominator in the computations of labour productivity, giving rise to some underestimations of productivity. However, part-time employees comprise only 4.56 percent of the total number of employees in the manufacturing sector. As such, these potential underestimations are not likely to have a substantial impact on the overall trends.

This paper has not undertaken international comparisons, since the definitions of SMEs differ across nations and such comparisons may not be valid, unless identical definitions are adopted<sup>6</sup>.

## 6.0 Summary and Conclusions

This paper shows that the large enterprises are not always more productive across the different economic sub sectors, based on a study of labour productivity and firm size amongst Malaysian SMEs in the manufacturing sector. As such, it suggests that a flexible policy approach that

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<sup>5</sup> This limitation arises from data availability constraints, as different definitions were used across different departments in the past. The data from the Census (2005) overcomes this limitation by employing common definitions across the manufacturing sub sectors.

<sup>6</sup> Rowena Barrett pointed out that the lack of common definitions hamper SME research across the world, in her keynote address at the SME-Entrepreneurship Global Conference, Melbourne, Sydney, July 3 -4, 2008.

provides strong support for both small and large SMEs would be more beneficial for improving productivity and innovation than policies that mainly help the larger enterprises.

Policy recommendations following the analysis include publicly funded one-stop SME help centres manned by trained consultants, government support for private small scale SME consultants, formation of an SME consultants' association, as well as recording the human capital, which results from human capital development activities, on balance sheets of SMEs.

The limitations include that imposed by the lack of definitions across the different departments and across nations. Only data that employs the new current definitions has been used to ensure that consistent definitions have been employed for the SMEs on which this analysis is based.

This paper offers some insights for national level policy makers in developing nations who are working on SME development. It suggests support for SMEs of different sizes, rather than just the larger enterprises, as a means for improving productivity and developing robust SMEs. Such SMEs can help to sustain long term employment and wealth creation, which will in turn help to eradicate poverty and improve the economic well being of peoples across the globe.



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**APPENDIX 1**

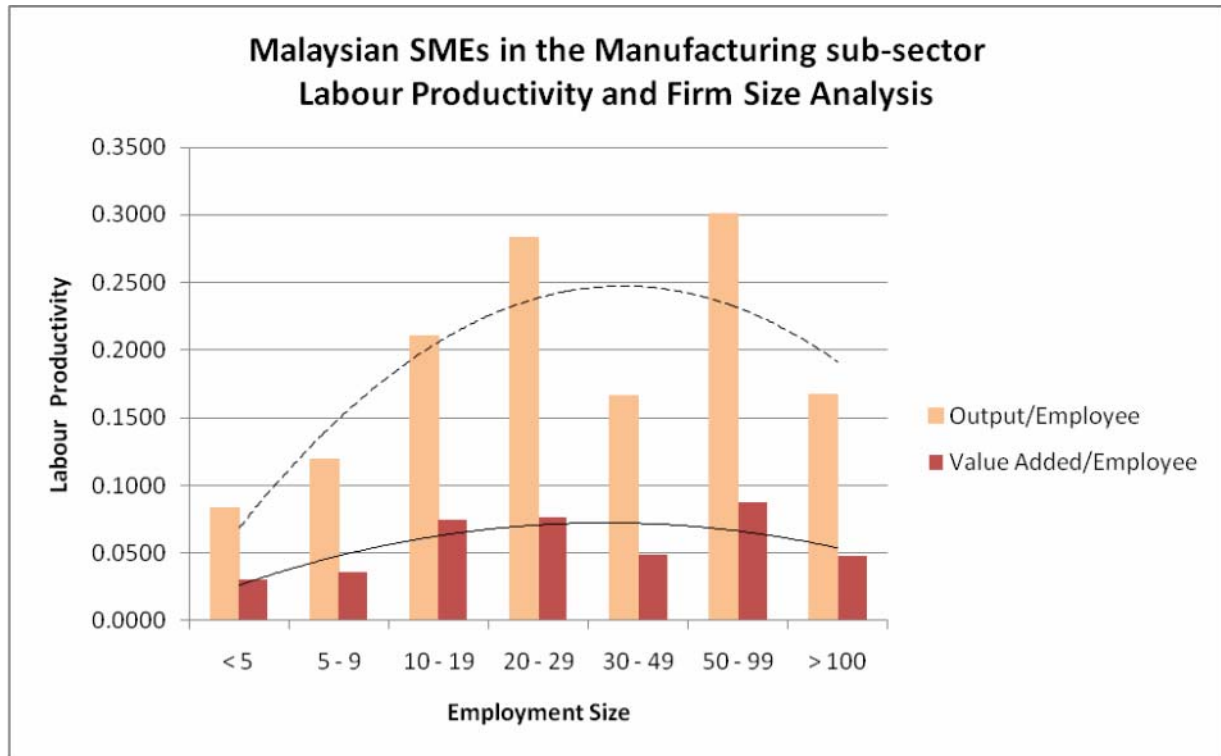
**TABLE 1: STANDARD SME DEFINITIONS USED IN MALAYSIA SINCE 2005**

| <b>SME TYPE</b>        | <b>MICRO</b>  | <b>SMALL</b>  | <b>MEDIUM</b>  |
|------------------------|---|---|--|
| Manufacturing          | Less than 5 employees or less than RM 250,000 annual sales turnover | 5 - 50 employees or RM250,000 - less than RM 10 million annual sales turnover | 51 – 150 employees or RM 10 million to RM 25 million annual sales turnover |
| Services & agriculture | Less than 5 employees or less than RM 200,000 annual sales turnover | 5 - 19 employees or RM200,000 - less than RM 1 million annual sales turnover  | 20 – 50 employees or RM 1 million - RM 5 million annual sales turnover     |

*Based on National SME Development Council, (2005).*

**APPENDIX 2**

**CHART 1: OVERALL ANALYSIS OF LABOUR PRODUCTIVITY IN SMES IN THE MANUFACTURING SECTOR**



The trendlines summarise the general relationship of labour productivity to firm size. The dotted trendline is based on the output per employee, while the solid trendline is associated with value added per employee. Both measures of productivity support the inverted-U theory in the overall investigation of Malaysian SMEs in the manufacturing sub-sector.

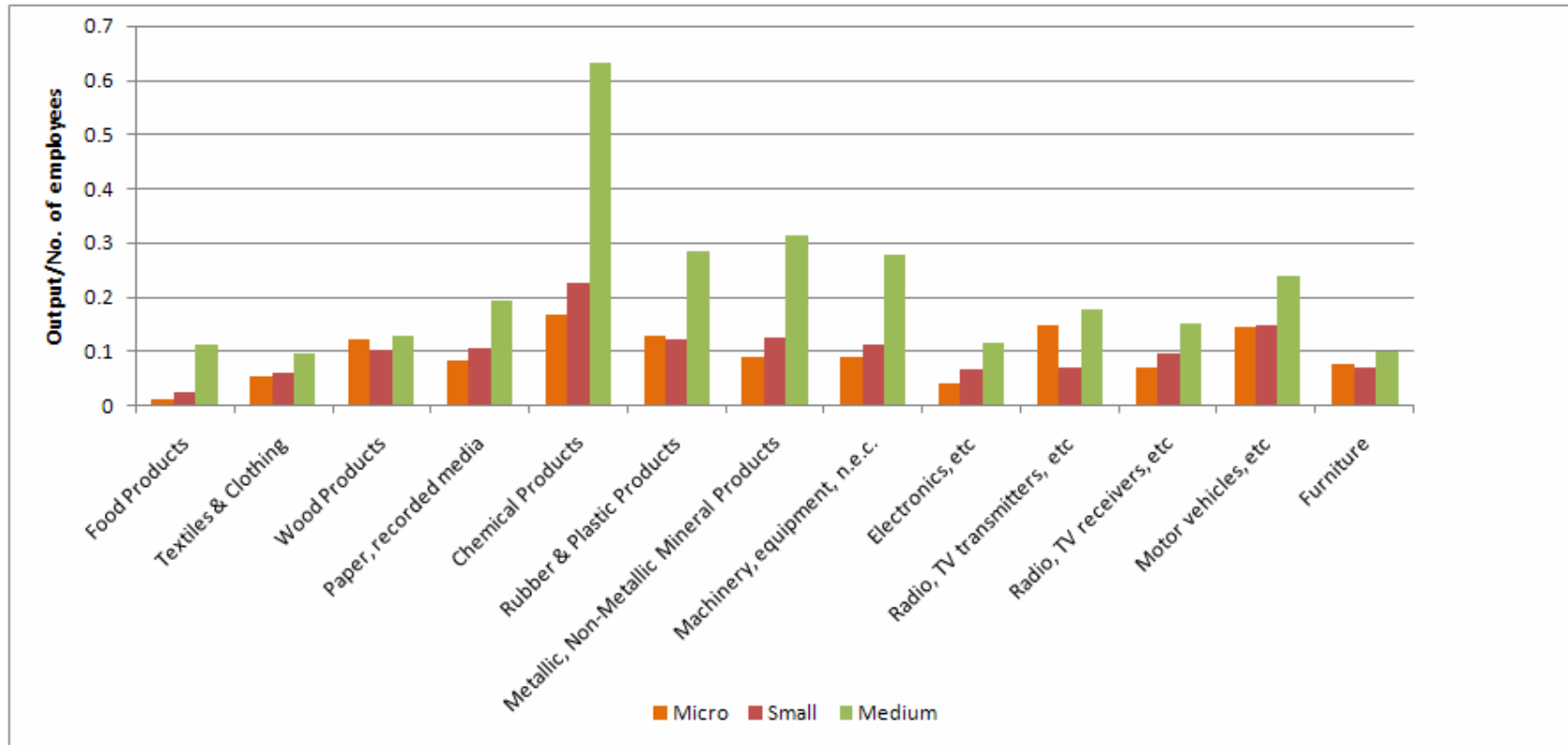
## APPENDIX 3

**TABLE 2: ANALYSIS OF LABOUR PRODUCTIVITY ACROSS MANUFACTURING SUB SECTORS AND FIRM SIZES  
IN MALAYSIAN SMES**

| Manufacturing sub sector                   | OUTPUT PER EMPLOYEE |          |          |          | VALUE ADDED PER EMPLOYEE |          |          |          |
|--|---------------------|----------|----------|----------|--------------------------|----------|----------|----------|
|  | Micro               | Small    | Medium   | Total    | Micro                    | Small    | Medium   | Total    |
| Food Products                              | 0.013464            | 0.026294 | 0.114211 | 0.056483 | 0.005162                 | 0.005475 | 0.019441 | 0.010401 |
| Textiles & Clothing                        | 0.056194            | 0.061126 | 0.097839 | 0.068393 | 0.025815                 | 0.026933 | 0.037614 | 0.029112 |
| Wood Products                              | 0.123484            | 0.104762 | 0.130109 | 0.115234 | 0.032227                 | 0.033216 | 0.044516 | 0.037433 |
| Paper, recorded media                      | 0.083087            | 0.10557  | 0.195249 | 0.130536 | 0.0373                   | 0.039969 | 0.070823 | 0.048984 |
| Petroleum Products                         | 0.135593            | 8.872109 | 5.880903 | 7.332553 | 0.033898                 | 3.640816 | 3.137577 | 3.283372 |
| Chemical Products                          | 0.168519            | 0.225297 | 0.632224 | 0.423686 | 0.056481                 | 0.07433  | 0.194149 | 0.132707 |
| Rubber & Plastic Products                  | 0.130829            | 0.122756 | 0.285065 | 0.193805 | 0.039724                 | 0.038251 | 0.079875 | 0.056455 |
| Metallic, Non-Metallic Mineral<br>Products | 0.089229            | 0.126477 | 0.314404 | 0.181688 | 0.038489                 | 0.044936 | 0.094027 | 0.059628 |
| Machinery, equipment, n.e.c.               | 0.089583            | 0.113774 | 0.277352 | 0.154599 | 0.036458                 | 0.047688 | 0.089163 | 0.05771  |
| Electronics, etc                           | 0.042821            | 0.068151 | 0.117529 | 0.088623 | 0.017632                 | 0.029188 | 0.039846 | 0.033276 |
| Radio, TV transmitters, etc                | 0.148148            | 0.070526 | 0.176915 | 0.123424 | 0.037037                 | 0.027368 | 0.048544 | 0.037815 |
| Radio, TV receivers, etc                   | 0.071429            | 0.098595 | 0.153899 | 0.122501 | 0.040816                 | 0.029468 | 0.04959  | 0.038479 |
| Motor vehicles, etc                        | 0.146974            | 0.150272 | 0.239697 | 0.188134 | 0.060519                 | 0.045263 | 0.078733 | 0.059906 |
| Furniture                                  | 0.079108            | 0.072888 | 0.101913 | 0.082979 | 0.029997                 | 0.025781 | 0.0338   | 0.028748 |

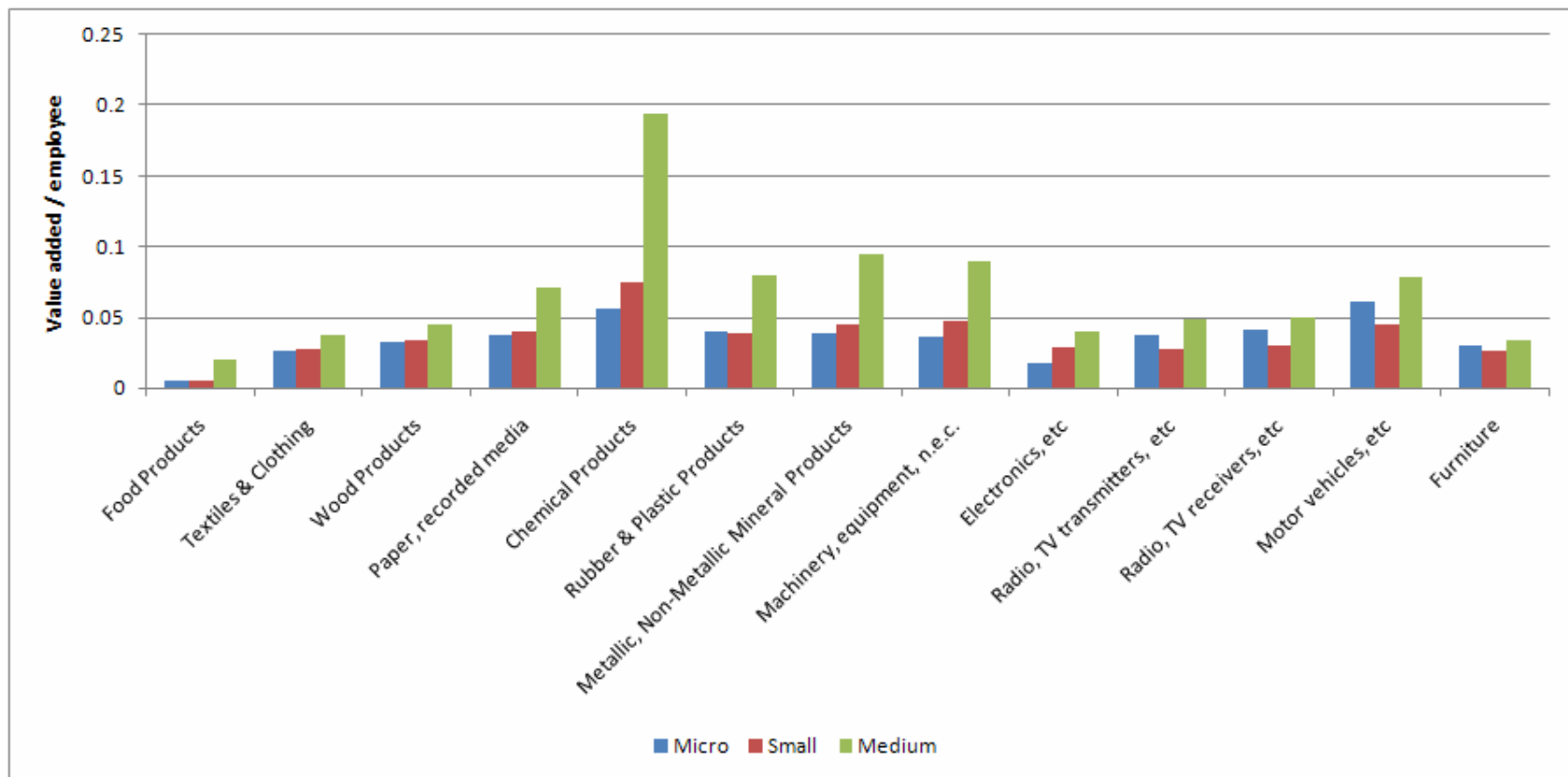
APPENDIX 4

**CHART 2: ANALYSIS OF OUTPUT PER EMPLOYEE IN MICRO, SMALL AND MEDIUM SIZED ENTERPRISES IN MANUFACTURING SUB-SECTORS WHERE OUTPUT PER EMPLOYEE INCREASES WITH FIRM SIZE**



APPENDIX 5

**CHART 3: ANALYSIS OF VALUE ADDED PER EMPLOYEE IN MICRO, SMALL AND MEDIUM SIZED ENTERPRISES IN MANUFACTURING SUB-SECTORS WHERE VALUE ADDED PER EMPLOYEE INCREASES WITH FIRM SIZE**





APPENDIX 6

**CHART 4: ANALYSIS OF LABOUR PRODUCTIVITY IN MICRO, SMALL AND MEDIUM SIZED ENTERPRISES IN THE PETROLEUM SUB-SECTOR: THE LABOUR PRODUCTIVITY - FIRM SIZE ANALYSIS INDICATES AN INVERTED U RELATIONSHIP**

