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Does Exporter Turnover Contribute to Aggregate Productivity Growth? Evidence from Malaysian Manufacturing.

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Abstract

Malaysia's economic success is to a significant extent underpinned by its export-oriented manufacturing sector. The sector has a large foreign presence, with MNCs attracted by the open trade and investment regime, and FDI-friendly policies. Using unpublished manufacturing census data for 2000 and 2005, we apply the methodology by Foster et al. (1998) to decompose productivity growth. The analysis shows that exporters were more productive than domestic-oriented establishments, and were distinctly more competitive. The empirical evidence also shows that establishment turnover is important in boosting productivity growth. In particular, we find that turnover of exporters made a larger contribution to aggregate productivity growth compared to domestic-oriented establishments during the period from 2000 to 2005. Surviving establishments (those that operated in both years), on the other hand, made a negative contribution. It is noteworthy that entrants to export markets were more productive than surviving non-exporters and even surviving exporters. Exiters from export markets or "export failures", on the other hand, were less productive than continuing exporters. Given the importance of turnover to productivity growth, the government should ensure unrestricted entry to the export sectors for both foreign and domestic investors. Continuing with pro-FDI policies is also important, given the keener global competition.

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1. Introduction

After growing at an average rate of 6.5 percent per annum over the period of 1971-2009, the Malaysian economy is now at a crossroads. The country's economic success was mainly the result of its export-oriented development model driven to a significant extent by foreign direct investment (FDI). However, Malaysia is beginning to lose its low-wage advantage, which was the main factor behind the large FDI flows that it attracted over the last three decades. Emerging economies in Indo-China, South Asia and reforming East European countries are becoming rivals for FDI. Hence, multinational corporations (MNCs) seeking low-cost labour to remain competitive in world markets can consider alternative destinations to countries like Malaysia.[4]

A highly interconnected global economy through increased cross-border trade and investment flows means that there will be more trading and investment opportunities but also greater competition. In such a fiercely competitive environment, it will not be surprising to see high firm turnover (i.e. entry and exit) in export markets. Turnover could be an important factor contributing to higher aggregate productivity in the manufacturing sector, which is why it should be analyzed.

Aggregate productivity in a sector or an industry would increase when establishments benefit from economies-of-scale, upgrade their technology, and increase technical efficiency. Exporting firms tend to have higher productivity than non-exporters because they are able to take advantage of scale economies by producing a large quantity of output for the world

[4] The stories of Intel and Dell, MNC success stories of the Malaysian 'FDI experience' are telling: the former has started operations in Vietnam and the latter in India, taking a part of its Malaysian operations there. This is likely to be a foreshadow of things to come as Malaysia's comparative advantage changes.

market (Chen and Tang, 1990), and may also benefit from "learning-by-exporting" effects[5] (for examples, see Wagner, 2007; Fryges and Wagner, 2008), which occur because productivity increases even further after a firm starts to export. Furthermore, there is considerable empirical evidence[6] on the "self-selection" hypothesis, which asserts that relatively more productive firms will have a higher propensity to enter export markets since only these highly productive firms could overcome high entry costs of entering international markets (Clerides et al., 1998; Bernard et al., 2003; Melitz, 2003).[7]

Aggregate productivity would also increase when resources are reallocated from less productive firms to more productive ones. One way in which this reallocation process works is through turnover of firms. Aggregate productivity would increase if less productive firms exit the industry and are replaced by more productive firms. Reallocation could also affect aggregate productivity when more productive firms expand and less productive firms contract. In an open economy, the process of reallocation can be triggered by exporters. While entrants to export markets which are more productive survive and expand, less productive firms either contract or leave the industry (Greenaway and Kneller, 2007). For

[5] For example, when firms participate in export markets, they can increase productivity through the acquisition of product knowledge and technical know-how from their international clients and suppliers. For empirical evidence supporting "learning-by-exporting" effects, see Bigsten et al. (2000) and Baldwin and Gu (2003).

[6] For a survey of previous studies supporting the "self-selection" hypothesis, see Greenaway and Kneller (2005) and Wagner (2007).

[7] These high entry costs can be related to the establishment of a new activity or the uncertainty involved in exporting or testing new markets (Baldwin 1988). According to Bernard and Wagner (2001) that the sunk costs of export entry could also include locating foreign buyers, and also learning about the market, relevant regulations and standards. In addition, Kim (1997) pointed out that there were other important operational costs associated with export activities such as financing, knowledge acquisition and transaction costs in connection with linguistic, cultural and legal differences.

example, Baldwin and Gu (2003) find that the contribution of export market entry and exit of plants to the aggregate productivity growth in Canadian manufacturing in the 1990s was 1.3 times more than the contribution from continuing plants in export markets.

This paper analyzes the contribution of surviving establishments and turnover to productivity growth in the Malaysian manufacturing sector, with a particular focus on exporters vis-à-vis domestic-oriented establishments. We decompose the aggregate productivity growth over 2000-2005 to determine if firms entering and exiting the export markets (i.e. turnover) have a significant impact on the sector's productivity growth. To the best of the authors' knowledge, this is the first such study on the Malaysian manufacturing sector.

The contributions of the present study are threefold. Firstly, the study provides new empirical evidence on Malaysian exporter turnover patterns in the manufacturing sector and their impact on the aggregate productivity growth. Firm-level studies on the patterns of productivity growth in the Malaysian manufacturing sector are limited. One aim of this study is to fill this gap. Secondly, the detailed firm-level study will provide further insights into the productivity performance of exporting firms, and this empirical knowledge can shed light on the future prospects and challenges of these firms (both new and surviving) in the dynamic and competitive global export markets. Lastly, these findings have useful policy implications for the future productivity growth directions of Malaysian manufacturing exporters. This could enable the government to design the appropriate policies to promote productivity growth within the sector and, to a larger extent, targeted at exporting firms. This sort of rigorous analysis is important, especially in the present context of the Malaysian economy, which is at a turning point. Policymakers are keen to move the economy up the value chain. As the restructuring of the economy unfolds, it is crucial for the authorities to be able to

monitor its path. Feedback based on empirical evidence can then be used to fine-tune policies.

The rest of the paper is structured as follows. Section 2 provides a concise overview of industrial development and the manufacturing sector in Malaysia. Section 3 discusses exporters in the Malaysian manufacturing sector and its salient features which have relevance to the analysis of turnover patterns. It also addresses data concerns, use and availability. This is followed by an account of how we track continuing exporters (and non-exporters), entrants to export markets, exiters from export markets, and calculation of turnover rates for exporters and non-exporters. Section 4 is concerned with the decomposition methods of productivity growth used in the study. The same section also presents and analyzes the key findings. The main conclusions and the policy implications are presented in Section 5.

2. Industrial development and the manufacturing sector - an overview

Since independence in 1957, the structure of the Malaysian economy has evolved from one that was reliant on primary commodity exports to one in which manufactured exports are pivotal. The engine of growth also switched from the public to the private sector, following the mid-1980s recession.

Early industrialization strategy was mainly import-substitution while the export sector was dominated by the primary commodity sector. By the late 1960s, the industrialization process entered a more outward-looking phase through export-oriented manufacturing. These included labour-intensive activities such as the electronics[8] and textile industries, wood-based

[8] Malaysia's comparative advantage is largely focused on the labour-intensive part of the electronics industry.

industries and processing of palm oil and rubber. The petrochemical industry emerged following the discovery of oil.

The promotion of the manufacturing sector in the country falls under the purview of the Malaysian Industrial Development Authority (MIDA), which is under the Ministry of International Trade and Industry (MITI). Industries are actively promoted through fiscal incentives in the form of pioneer status, various tax exemptions, duty-free imported inputs, investment tax credits, tariff protection and the development of free trade zones. Incentives are also given for research and development (R&D), and training. Credit is made available through the commercial banks and industrial development institutions. The government also actively encourages FDI in the sector.[9]

The government also promoted heavy industries as part of the affirmative action programme favouring the *Bumiputera*[10] group, driven by the New Economic Policy (NEP). A state-owned holding company formed partnerships with foreign companies in heavy industries like automobiles, iron and steel, petrochemicals, cement and transport equipment. Although the official rhetoric was pitched at emulating the economic success stories of the 'Asian Tigers', in reality these were inward-looking ventures heavily protected and subsidized by the government. Athukorala and Menon (1999, p. 1130) dubbed such industries under state patronage as "born losers" that were "artificially spawned with subsidies".

The industrialization effort in Malaysia in the second half of the 1980s was also shaped by global developments such as the realignment of exchange rates for the major currencies following the Plaza Accord of September 1985. Less competitive home currencies of some

[9] A list of selected incentives is presented in Appendix 1.

[10] Generally refers to the largely Malay ethnic group, although the term also includes minority indigenous *Orang Asli* groups.

industrialized countries, together with rising wages, meant that domestic firms sought foreign locations for their production. The South-East Asia region was a beneficiary of this development as its abundant low-wage workforce made it a competitive export base for foreign firms. Malaysia rode on this development by adopting FDI-friendly policies. Fuelled by robust FDI inflows, the manufacturing sector's share of GDP rose to 26.9 percent in 1990 compared with 19.7 percent in 1985.

To enhance economic competitiveness, in the 1990s, some of the ethnic requirements were relaxed with better incentives extended to private sector investors. Regulations on equity participation were relaxed to boost FDI. This was especially so for the export-oriented sectors, where foreigners can own up to 100 percent equity. To assist in the setting-up of foreign firms in the country, administrative measures were eased and speeded up. Thus, the 1990s saw further expansion of the export-oriented manufacturing sector, driven by foreign investment. Malaysia became one of the world's top exporters of electronics and electrical appliances. Although the East Asian currency crisis of 1997-98 disrupted growth, the economy has since recovered and resumed a more sustainable growth path.

Hence, economic policy in Malaysia has long emphasized export-led growth through private sector participation and attracting FDI. The export-oriented sectors were able to procure imported inputs at world prices so as not to jeopardize their global competitiveness. This policy stance of promoting export-led manufacturing has always been preserved by the government. As pointed out by Athukorala and Menon (1999), the protection (and patronage) given to politically sensitive ventures in domestic-oriented heavy industries[11] did not compromise the development of the export sectors in manufacturing.

[11] Athukorala and Menon (1999) termed it as the "picking winners" policy.

Over time, the protection given to the manufacturing sector from foreign competition has also declined. Alavi (1996) pointed out that the average effective rate of manufacturing protection declined from 70 percent in the early 1970s to less than 30 percent by the late 1980s. Athukorala and Menon (1999) noted that by the mid-1990s, the import-value weighted average nominal tariff was as low as 15 percent. Alavi (1996) also showed that the best performing firms in TFP growth over the period 1979-89 were in labour-intensive industries dominated by the private sector, which received little or no direct government assistance. Some of these industries are export-oriented ones like textiles and apparel, and footwear.

The importance of manufactured exports can be seen in its rising share of Malaysia's total exports over the years. The composition of Malaysia's manufactured exports has evolved over the years. In the 1970s and early 1980s, the manufactured exports were mainly resource-based (e.g. food and beverages, wood products, tobacco etc.). In the second half of the 1980s, there was a distinct shift towards exports of electronics, electrical machinery and appliances. Exports of electronics and electrical goods (or "E&E") made up 72.5 percent of total manufactured exports in 2000.

The changing composition of manufactured exports is linked to the strong foreign presence in the sector. Using Malaysia as a production base for manufactured exports, foreign MNCs had shaped the sector into a more export-oriented one. Athukorala and Menon (1999) noted that FDI had increased about ten-fold between 1987 and 1991, and Malaysia had outperformed its ASEAN neighbours as a host country.[12] The FDI inflows were mostly concentrated in the electronics, electrical appliances, and consumer goods sectors. Reflecting the importance of foreign firms in the export-oriented sectors, Athukorala and Menon (1999)

[12] ASEAN is the acronym for the Association of South-East Asian Nations, then comprising Malaysia, Singapore, Thailand, Indonesia, Philippines and Brunei.

observed the high positive correlation of foreign presence and the sector's contribution to total manufactured exports.

In summary, the manufacturing sector played a vital role in industrializing the economy owing to the adoption of an export-oriented industrialization strategy over the past four decades (see Ariff, 1994). As a result, manufactured goods make up a significant share of the country's total exports (2009: 77.8%). Table 1 provides some useful indicators on the manufacturing sector in Malaysia for selected years.

[Insert Table 1 here]

3. Exporters in Malaysian manufacturing

We use unpublished data from the 2000 and 2005 *Census of Manufacturing* obtained from the Department of Statistics, Malaysia. The census covered all manufacturing establishments registered with the Companies Commission of Malaysia. The census frame also used information from other sources, such as trade associations, federal and state development authorities, and is updated annually. An establishment is a single unit which could be part of a multi-establishment firm (each unit of a multi-establishment firm operating at a different location has to submit a different census form). The sample size for the year 2000 was 20,080, while that for 2005 was 28,094.[13]

Exporters in the manufacturing sector of Malaysia numbered 3,294 in 2000 and 2,915 in 2005 (see Table 2), representing 16.4 percent and 10.4 percent of all establishments in the two respective years. Thus, Malaysian manufacturing had shed 11.5 percent of its exporters over

[13] We deleted 374 establishments from the dataset because their value-added in 2000 was either negative or zero. Two establishments with extremely high productivities were also deleted since, as outliers, they may bias the results.

the period. While 567 establishments switched from solely producing for domestic markets to producing for export markets as well by 2005, there were 1,127 exporters that did the opposite (that is, they exited export markets and produced for the domestic markets). Meanwhile, 932 of 16,400 new establishments and 751 of 8,386 establishments that exited the manufacturing sector in 2005 were exporters. Therefore, the decline in the number of exporters was largely due to the net change in the number of switchers, which are those establishments that operated in both years but switched out of or into exporting.

[Insert Table 2 here]

We track survival, entry, and exit by tracing the appearance or disappearance of the unique identification number assigned to each establishment.[14] Establishments whose identification numbers appeared in both 2000 and 2005 are survivors, exiters are the establishments whose identification numbers appeared in 2000 but disappeared in 2005, and entrants are the establishments whose identification number did not appear in 2000 but appeared in 2005. We further categorize survivors into four groups: establishments that exported in both 2000 and 2005 are called 'continuing exporters', and those that did not export in either year are called 'continuing non-exporters'. The remaining two groups consist of establishments that switched from non-exporting to exporting ('entrants to export markets'), and establishments that did the opposite ('exiters from export markets').

Entry and exit rates for exporters, non-exporters, and all manufacturing establishments are calculated by dividing the number of entrants and exiters by the total number of exporters, non-exporters, and manufacturing establishments in 2000 respectively. Turnover rate is the sum of entry and exit rates, and are shown in the bottom panel of Table 2, together with entry

[14] We cannot identify the establishments that were sold or reorganized, or changed their names, and were given a different identification number. Hence, entry and exit rates will be affected to the extent this is true.

and exit rates. Out of 20,080 establishments that were in business in the beginning of the period, 8,386 establishments exited. This yields a 42 percent exit rate. Entry rate for all establishments is 82 percent (16,400 establishments), giving rise to an overall turnover rate of 124 percent. Turnover rate of exporters is 102 percent while that of non-exporters is 147 percent.

[Insert Table 3 here]

Table 3 shows the shares of survivors and entrants for various indicators: number of establishments, employment, wages, value added, gross output, number of exporters and export value. Survivors are broken down into the four groups mentioned earlier. Exiters (in 2000) and entrants (in 2005) are classified under two groups - exporters and non-exporters. From the table, it is clear that the shares of employment, wages, value-added, and gross output accounted for by exporters were significantly higher than that of non-exporters. This is in sharp contrast to the fact that there were far less number of exporting establishments than non-exporting ones. For example, while exporters made up 16.40 percent of all establishments in 2000, their share of value-added and employment were 62.50 percent and 57.68 percent respectively.[15] This indicates that many exporting establishments were large since they generated most of the employment and value-added despite their small numbers.

The data presented in Table 3 also provide some perspective on the effect of turnover on the manufacturing sector. In 2000, the percentage of establishments that exited the manufacturing sector was 41.76 percent; in 2005, entrants made up 58.38 percent of total establishments. A very high percentage of both exiters and entrants were non-exporters, reflecting the overall structure of establishments in this aspect. Entrants,[16] as a group, made

[15] This same trend was observed for 2005 data.

[16] Refer to row labelled "all entrants" in Table 3.

higher contributions to employment, wages, value-added and gross output than exiters[17] did. Although the percentage of entrants which exported (31.97%) was noticeably higher than that of exiters which exported (22.80%), the former's share in value of exports (15.28%) was marginally lower than that of the latter's (15.38%).

Table 4 shows the contribution of survivors and turnover (entrants and exiters) to growth of employment, wages, value-added and gross output over the two years, 2000 and 2005. The data are also categorized by exporters and non-exporters. While non-exporters recorded positive and significant contributions in all categories, exporters made negative contributions to employment, wages, value-added, and a positive though small contribution to gross output growth. To illustrate, exporters accounted for -3.08 percent, and non-exporters for 13.04 percent of the 9.96 percent growth in value-added over the period. At this point, we recall that the number of exporters had declined by 11.5 percent over the period, [18] and this could have an impact on some of the observations noted here.

[Insert Table 4 here]

The relative impact of turnover is also captured by data presented in Table 4. Compared to survivors, turnover made a higher contribution to the growth in employment and especially value-added, but lower contribution to the growth in wages, gross output, and value of exports (see rows marked 1 and 2 in Table 4). Turnover of exporters made large but negative contributions to the growth in all variables (row-6 in Table 4), with most of the negative growth in each variable accounted for by the turnover of switchers (row-4). In contrast, continuing exporters made positive although small contributions to growth, except for gross output.

[17] Refer to row labelled "all exiters" in Table 3.

[18] As noted in the discussion on Table 2.

Turning our attention to non-exporters, it is observed that turnover (row-11 in Table 4) made a significantly larger positive contribution to growth than continuous non-exporters (row-8). However, in this case, the entry and exit of non-exporters (row-10) made a noticeably larger impact than switchers out of export markets (row-9) in all variables except for value-added.

Table 5 presents various characteristics of different groups of establishments. Productivity is calculated as (real) value-added per worker. Real value-added is obtained by deflating with the Producer Price Index for the whole manufacturing sector. The number of workers engaged is the total on payroll in December or the last pay period of the reference year. Compared to non-exporters, exporters had a larger mean size (as measured by number of workers) and generated higher mean value-added and mean gross output. They also showed higher productivity and gross output per worker. Exporters also paid higher wages, as one would expect given their higher productivity.

[Insert Table 5 here]

We present the average productivities of 'continuing exporters', 'exiters from export markets', 'entrants to export markets', and 'continuing non-exporters' in Table 6. For both the reference years 2000 and 2005, 'entrants to export markets' were the most productive while 'continuing non-exporters' were the least. In fact, it is clear from the data that the export-oriented establishments were distinctly more productive than domestic-oriented ones. Even the 'exiters from export markets' were more productive than 'continuing non-exporters'. However, these 'exiters' were evidently less productive than 'continuing exporters', indicating that weak exporters eventually dropped out of global markets. The average productivity level of these "export failures" was almost as low as that of establishments that continued serving the domestic markets throughout. It is also of interest

to note that the average productivity of 'entrants to export markets' was higher than that for 'continuing exporters'.

In terms of productivity *growth*, a different trend emerged between exporters and non-exporters. While the productivity of 'continuing non-exporters' showed growth (5.79%), that of all other groups registered declines. Among these three groups, the productivity of 'entrants to export markets' declined the most (-10.95%) over the two reference years, followed by 'continuing exporters' (-4.90%) and 'exiters from export markets' (-1.32%).

[Insert Table 6 here]

The results from the productivity data in levels may favour the "self-selection" hypothesis as establishments with superior productivity enter the export markets and survive while laggards unable to compete leave the global markets. However, it is noted that the productivity growth of 'continuing exporters' was better than that of 'entrants to export markets', which indicates support for the "learning-by-exporting" argument.

The data on productivity growth appear counter-intuitive to expectations that exporters (operating in the fiercely competitive global environment) would likely outperform domestic-oriented establishments. At this juncture, it is pertinent to note developments in the manufacturing sector over the period that may shed light on the present analysis. The manufacturing sector (in tandem with the economy) recovered strongly from the East Asian currency crisis of 1997-98 in 1999 and 2000. However, in 2001, the significant global economic slowdown, especially in the United States and Japan, caused the Malaysian manufacturing sector to contract by about six percent as demand for electronic products slumped. Although the sector resumed growth in 2002, its growth rate was at a more moderate pace. In 2005, the manufacturing sector grew by a modest 4.9 percent. Of significance was the sharply lower output growth of 3.5 percent in the E&E products industry

that year (2004: 19.3%). This was on account of the global semiconductor down-cycle in the first half of 2005, resulting in oversupply. The weak construction sector had also affected related manufacturing industries. Value-added of the manufacturing sector could have been affected as depressed demand conditions may mean more competitive pricing, resulting in lower margins. It is plausible that the productivity numbers for 2005 could have been influenced by this as the sector continued to recover. This may help explain the negative productivity growth rate for the export-oriented establishments over the two reference years. Notwithstanding this, it is stressed that the absolute (average) productivity numbers showed that exporters were significantly more productive than the domestic-oriented establishments. This is a valid observation for both the census years.

4. Productivity decompositions

Aggregate labour productivity can be calculated as a weighted average of establishment level productivities:

$$P_t = \sum_i s_{it} p_{it} \qquad (1)$$

where s_{it} is the share of establishment *i* in aggregate employment in year *t* ($\sum_i s_{it} = 1$) and p_{it} is the labour productivity of establishment *i* in year *t*. We use labour productivity (value-added over employment) instead of a measure of total factor productivity to avoid the problems that would arise from using the book value of assets as a proxy for capital, which would be needed in the calculations.[19] Using employment shares rather than market shares as weights for labour productivity is more common (Ahn, 2001), and also more intuitive (Van

[19] There are doubts as to the accuracy of the fixed assets data for establishments reporting very low values, e.g. RM1.

Biesebroeck, 2005) since the sum of weighted labour productivities over all establishments would add up to the aggregate productivity.

Our main method of decomposition is the Foster, Haltiwanger and Krizan (1998) (henceforth FHK) method, which can be expressed as:

$$\frac{\Delta P_t}{P_{t-k}} = \frac{\sum_{i\in S} s_{i,t-k}\Delta p_{it}}{P_{t-k}} + \frac{\sum_{i\in S} \Delta s_{it}(p_{i,t-k} - P_{t-k})}{P_{t-k}} + \frac{\sum_{i\in S} \Delta s_{it}\Delta p_{it}}{P_{t-k}} + \frac{\sum_{i\in N} s_{it}(p_{it} - P_{t-k})}{P_{t-k}} - \frac{\sum_{i\in X} s_{i,t-k}(p_{i,t-k} - P_{t-k})}{P_{t-k}} \quad (2)$$

where *S*, *N*, and *X* denote survivors, entrants, and exiters respectively. P_{t-k} is the aggregate (weighted average) productivity in year *t-k*, which is the year 2000 in our case. The symbol Δ indicates the change in a variable across the two years.

The first term in equation (2), the 'within effect', represents the contribution of survivors to productivity growth due to increasing or decreasing establishment productivity, holding base year employment shares constant. The second term, the 'between effect', reflects the contribution of survivors with above or below average productivity to productivity growth through their expansion or downsizing. The 'cross effect', which is the third term, represents the contribution of survivors with increasing or decreasing productivities to productivity growth through their upsizing or downsizing. The sum of the last two terms, the 'entry' and 'exit' effects, is the contribution of turnover to productivity growth. It is also known as the 'net entry effect'. Note that the 'exit effect' is negative if exiting establishments have lower productivity. Hence, the negative sign preceding the term allows for a positive impact on aggregate productivity.

For sensitivity analysis, we use a second method by Griliches and Regev (1995) (hereafter GR), which differs from the FHK method in that it replaces the initial (base year) values of

employment shares, plant and aggregate productivities with the time averages of these variables. This replacement yields:

$$\frac{\Delta P_t}{P_{t-k}} = \frac{\sum_{i \in S} \bar{s}_i \Delta p_{it}}{P_{t-k}} + \frac{\sum_{i \in S} \Delta s_{it}(\bar{p}_i - \bar{P})}{P_{t-k}} + \frac{\sum_{i \in N} s_{it}(p_{it} - \bar{P})}{P_{t-k}} - \frac{\sum_{i \in X} s_{it-k}(p_{it-k} - \bar{P})}{P_{t-k}} \quad (3)$$

All variables are defined as before, and a bar over a variable denotes a time average. Due to time averaging, there is no 'cross' term in the GR method. An advantage of the GR method over the FHK method is that, by using time averages, the effect of random measurement errors is reduced (Foster et al. 1998). However, interpreting the 'within' and 'between' terms is difficult with the GR method, since by including the time average of shares in the former and the time average of productivities in the latter, we would no longer be holding these two variables fixed at their initial values (Foster et al. 1998).

The decomposition results are presented in Table 7, with the effects of survivors broken into four categories: 'continuing exporters', 'exiters from export markets', 'entrants to export markets', and 'continuing non-exporters'. The results from the FHK decomposition show that the aggregate productivity of manufacturing establishments increased over the sample period by 2.38 percent, which was due to the positive contribution of turnover (4.38%) outweighing the negative contribution of survivors (-2.00%). Results from the GR method are consistent, with a higher contribution of turnover (4.35%) and lower but still negative contribution of survivors (-1.97%). These results clearly show that without entry and exit, which generate the 'net entry' or turnover effect, aggregate productivity growth would have been much lower because of the negative contribution of survivors.

Closer inspection of the decomposition results reveals that establishments that served domestic markets throughout ('continuing non-exporters') made the most significant

contribution to productivity growth (1.20%). In contrast, most of the negative contribution made by survivors were accounted for by 'continuing exporters' (-1.92%), followed by that of 'entrants to export markets' (-1.16%). The GR method yielded results that are consistent in terms of signs and relative contribution of the various establishment categories.

[Insert Table 7 here]

The FHK decomposition results indicate that the 4.38 percent contribution of turnover to aggregate productivity growth (positive 'net entry' component) was largely due to a significant 'exit effect' contributing 6.61 percent to growth[20], which together with an 'entry effect' of -2.23 percent, produces the 'net entry' effect. This means that establishments making a lower contribution to aggregate productivity growth (exiters) were replaced by establishments making a higher contribution to it (entrants). We note that turnover of exporters (3.79%) made a significantly larger contribution to aggregate productivity than the turnover of non-exporters (0.59%). The positive impact of "churning" on productivity growth in the export sector can be broken down to new establishments making a positive contribution of 1.40 percent while exiting failed exporters accounted for 2.39 percent of growth.[21] In other words, the productivity increase for exporters was due to lower productivity establishments exiting and the positive impact of entrants to the industry, rather than from internal improvements.

[20] The computed figure is actually -6.61 percent as the exiters have lower productivity. However, as in equation (2), the 'exit effect' term is preceded by a negative sign to allow for a positive impact in such situations. This means that if exiting firms were less productive, it boosts aggregate productivity while if they had higher productivity, their departure will obviously reduce aggregate productivity. In our case, it is more intuitive to present the 6.61 percent as positive to show that it boosted aggregate productivity.

[21] The -2.39 percent contribution is presented here as positive for clearer interpretation. See preceding footnote.

The results of further decomposition of survivors' contribution are presented in Table 8. Survivors' overall -2.00 percent contribution to aggregate productivity growth was due to the large negative 'cross effect' (-5.96%) together with a smaller negative 'within effect' (-1.40%) outweighing the positive contribution of the 'between effect' (5.37%).

The 'within effect' shows the contribution to sector productivity growth from increasing or declining establishment productivity. It is noteworthy that 'continuing non-exporters' was the only category to record a positive contribution (1.04%) while 'entrants to export markets' had a large negative value (-1.68%). The contribution of 'exiters from export markets' (-0.24%) was higher than that of 'continuing exporters' (-0.53%).[22] This is consistent with the average productivity growth analyzed earlier. Hence, among the establishments that remained in operation throughout the period, only the domestic-oriented ones showed internal improvement.

The 'between effect' shows the impact of redistribution of resources across establishments that remained open throughout the period. A positive 'between effect' was obtained for all four categories of establishments. This indicates the dominance of survivors with above average productivities increasing their employment shares, and survivors with below average productivities with declining employment shares. The positive 'between effect' shows that labour has been allocated efficiently. That is, the more productive establishments had increased their labour share while less productive ones had lost their share over this period. This was more pronounced among the 'continuing non-exporters' (1.90%) and least among the 'entrants to export markets' (1.06%).

The 'cross effect' term shows whether productivity improvement corresponds with increasing labour share. The negative sign obtained is due to the declining employment shares of

[22] In the sense that the former group had a smaller negative value compared with the latter group.

survivors whose productivity improved, and to the increasing employment shares of survivors whose productivity worsened. All four categories of establishments showed negative values, with 'continuing exporters' (-2.59%) and 'continuing non-exporters' (-1.75%) being the two largest.

[Insert Table 8 here]

5. Conclusions

Exporters make a very significant contribution to the Malaysian manufacturing sector. They generate most of the employment and value-added in the sector although their numbers are small compared with domestic-oriented firms. Exporters are larger establishments compared with domestic-oriented ones; they produce higher mean value-added, are more productive, and pay higher wages. Significant resources have been channelled by the government in promoting export-oriented manufacturing activities, including incentives to attract foreign direct investment. Given the significance of exporters to the sector, it is important to critically evaluate their contribution as it would assist the government in policymaking.

The productivity analysis shows that exporters were more productive than domestic-oriented establishments, indicating that exporters were distinctly more competitive during the period of analysis. This reaffirms the government's longstanding policy of promoting an open trade and investment policy to boost economic growth through export activities. At a more detailed level, several interesting observations were revealed by the study. Entrants to export markets were more productive than both the surviving domestic-oriented establishments (non-exporters) and, even more telling, surviving exporters. On the other hand, exiters from the export markets or "export failures" were less productive than continuing exporters.

The productivity decomposition shows that without turnover (entry of new establishments and exit of failed ones), sectoral growth would have been adversely affected, since surviving establishments made a negative contribution. Entrants to the sector made a higher contribution to productivity growth compared with exiters. In particular, turnover of exporters made a significantly larger contribution than turnover of domestic-oriented establishments. This shows the importance of the "churning" process to maintain competitiveness in the export sectors.

However, the decomposition shows that among surviving establishments, only continuing non-exporters had a positive impact on sector productivity due to within-firm productivity improvements and positive reallocation effects. On the other hand, continuing exporters and entrants to export markets contributed negatively. Nevertheless, inter-firm reallocations of labour (between effects) were efficient for all establishment categories, with those above average productivity gaining labour share overall. This was most evident among the domestic-oriented establishments that remained in operation throughout the period. Hence, the empirical evidence shows that reallocation is a powerful channel in keeping the manufacturing sector competitive.

The positive impact of establishment turnover on productivity growth, especially for the export sector, has several policy implications. For example, it makes a strong case that the government should ensure that there is unrestricted entry in export sectors that it wants to promote as global beaters, and this should be extended to *both* foreign and domestic investors. In view of the importance of FDI in the export-oriented industries, policies should continue to attract foreign investors and enhance the country's attraction as an FDI

destination.[23] Hence, the policy of openness that was so successful hitherto has to be continued and perhaps even stepped up, in view of the more competitive global environment. Similarly, the government should also not intervene to protect ailing industries where Malaysia does not have any meaningful comparative advantage through protection and/or subsidies. The 'dualism' that Athukorala and Menon (1999) alluded to in Malaysian industry – having highly protected (politically connected) inward-looking sectors, and open, globally competitive export-oriented sectors – should be eliminated to bring the economy to a higher competitive level.

The New Economic Model (NEM) unveiled in March 2010 by Prime Minister Najib seeks to transform the Malaysian economy to a high value one and realize the nation's aspirations to attain developed nation status by 2020.[24] However, Malaysia is a small economy and there is a limit to which its domestic market can be counted on to support brisk economic growth. Hence, the country cannot afford not to embrace the global markets for growth. It is evident from our analysis that export-oriented establishments are more productive than domestic-oriented ones. About one-third of these exporters are foreign-owned. An open trade and investment policy that is foreign investor-friendly is the only realistic option for the country to enjoy continued economic prosperity. This has been applied very successfully to the export-oriented manufacturing sectors. Perhaps it's timely for the government to consider a similar policy stance for other industries within the manufacturing sector that have been enjoying political patronage and hence not subjected to the demanding realities of global competitive forces. Taking a broader outlook and in view of the need to seek new growth

[23] Malaysia has to develop its "advanced factors" as Porter (1998) calls it, especially highly skilled human resource, and a strong technology and knowledge base, so as to attract higher value FDI.

[24] See 'Office of the Prime Minister of Malaysia' website (www.pmo.gov.my) for details on the New Economic Model.

areas, the same can be said for the services sector, which made up 49.7 percent of real GDP in 2009 (excluding government services) but is largely inward-looking and protected.

Lastly, the empirical work also showed that among survivors, non-exporters made the most significant contribution to productivity growth, albeit their productivity lags behind that of exporters. Such evidence of intra-firm improvements would at least lend support to government policies in assisting these sectors but not through protection and subsidies, which tend to attract and entrench vested interests. Instead, the government can help through meaningful assistance like start-up capital, financial aid for research and development, technical expertise, improving marketing etc. Developing robust domestic industries will diversify the growth base and reduce imbalances. In the longer term, these firms may well turn into global competitors.

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Table 1: Malaysia's manufacturing sector - various indicators

	2000	2005	2009
Manufacturing value added (% of GDP)	30.9	30.7	26.9
Export-oriented manufacturing: weight in IIP	0.80	0.80	n.a.
Manufactured exports (% of total exports)	85.2	80.7	77.8
Electronics & electrical exports (% of manuf. exports)	72.5	65.4	57.4

Source: Calculated from data obtained from Bank Negara Malaysia publications.

Notes: GDP: Gross domestic product; IIP: Index of industrial production.

Table 2: Number of manufacturing exporters and non-exporters in 2000 and 2005

	Number of establishments				
	Status in 2005				
Status in 2000	Exporters	Non-exporters	Sum	Exiters	All in 2000
Exporters	1,416[a]	1,127[b]	2,543	751	3,294
Non-exporters	567[c]	8,584[d]	9,151	7,635	16,786
Sum	1,983	9,711	11,694	8,386	20,080
Entrants	932	15,468	16,400		
All in 2005	2,915	25,179	28,094		
	Turnover rates (%)				
	Exporters	Non-exporters	Sector		
Switchers in 2005	17[c]	7[b]			
Entrants	28	92			
Entry rate (NR)	45	99	82		
Switchers in 2000	34[b]	3[c]			
Exiters	23	45			
Exit rate (XR)	57	48	42		
Turnover rate (NR+XR)	102	147	124		

Source: Calculated by using the data obtained from the Department of Statistics, Malaysia.

Notes: [a]Continuing exporters; [b]exiters from export markets; [c]entrants to export markets; [d]continuing non-exporters; turnover rates are calculated as a percentage of the entries in the last column.

Table 3: Categories of manufacturing establishments - share in various variables (%)

	Number of establishments	Employment	Wages	Value added	Gross output	Number of exporters	Value of exports
				in 2000			
Continuing exporters *(1)*	7.05	30.30	32.73	38.74	38.40	42.99	55.46
Exiters from export markets *(2)*	5.61	17.92	18.80	16.69	20.98	34.21	29.16
Entrants to export markets *(3)*	2.82	6.99	7.19	10.86	7.93	0.00	0.00
Continuing non-exporters *(4)*	42.75	22.77	21.24	18.30	14.63	0.00	0.00
All survivors *(1+2+3+4)*	58.24	77.98	79.96	84.59	81.94	77.20	84.62
Exiting exporters *(5)*	3.74	9.46	8.98	7.07	10.77	22.80	15.38
Exiting non-exporters *(6)*	38.02	12.56	11.06	8.34	7.29	0.00	0.00
All exiters *(5+6)*	41.76	22.02	20.04	15.41	18.06	22.80	15.38
All exporters *(1+2+5)*	16.40	57.68	60.51	62.50	70.15	100.00	100.00
All non-exporters *(3+4+6)*	83.60	42.32	39.49	37.50	29.85	0.00	0.00
				in 2005			
Continuing exporters *(1)*	5.04	30.20	32.74	35.88	41.02	48.58	72.34
Exiters from export markets *(2)*	4.01	16.59	17.61	14.89	16.50	0.00	0.00
Entrants to export markets *(3)*	2.02	7.06	7.14	9.54	7.67	19.45	12.38
Continuing non-exporters *(4)*	30.55	21.86	21.12	18.15	14.27	0.00	0.00
All survivors *(1+2+3+4)*	41.62	75.71	78.61	78.46	79.47	68.03	84.72
Entering exporters *(5)*	3.32	7.42	7.43	8.61	8.96	31.97	15.28
Entering non-exporters *(6)*	55.06	16.87	13.96	12.93	11.58	0.00	0.00
All entrants *(5+6)*	58.38	24.29	21.39	21.54	20.53	31.97	15.28
All exporters *(1+3+5)*	10.38	44.68	47.31	54.03	57.65	100.00	100.00
All non-exporters *(2+4+6)*	89.62	55.32	52.69	45.97	42.35	0.00	0.00

Source: Calculated by using the data obtained from the Department of Statistics, Malaysia.

Note: Survivors are establishments that operated in both years.

Table 4: Contributions to growth in total employment, wages, value added, gross output, and value of exports (% growth rate, 2000-2005)

Contribution of:	Employment	Wages	Value added	Gross output	Value of exports
Survivors *(1)*	3.34	9.10	1.68	20.43	5.16
Turnover *(2)*	4.06	4.19	8.28	8.39	0.81
Continuous exporters *(3)*	2.15	4.36	0.71	14.45	21.19
Switchers into export markets[a] *(4)*	-10.34	-10.71	-6.19	-11.10	-16.03
Entry and exit of exporters *(5)*	-1.50	-0.56	2.40	0.76	0.81
Turnover of exporters *(6=4+5)*	-11.83	-11.27	-3.80	-10.34	-15.22
Exporters *(7=3+6)*	-9.69	-6.91	-3.08	4.12	5.97
Continuous non-exporters *(8)*	0.70	2.69	1.66	3.75	0.00
Switchers out of export markets[b] *(9)*	5.56	4.75	5.88	7.63	0.00
Entry and exit of non-exporters *(10)*	10.82	12.76	5.51	13.33	0.00
Turnover of non-exporters *(11=9+10)*	16.39	17.51	11.39	20.95	0.00
Non-exporters *(12=8+11)*	17.09	20.20	13.04	24.70	0.00
Growth *(1+2 or 7+12)*	7.40	13.29	9.96	28.82	5.97

Source: Calculated by using the data obtained from the Department of Statistics Malaysia.

Notes: [a]Difference between values in 2005 (of the entrants to export markets) and 2000 (of the exiters from exports markets) ; [b]difference between values in 2005 (of the exiters from export markets) and 2000 (of the entrants to exports markets).

Each entry is calculated as change over the total value in 2000 (e.g. survivors contribution of 3.34% to employment is change in survivors' employment divided by the total employment in 2000).

Survivors are establishments that operated in both years.

Table 5: Characteristics of manufacturing establishments (in constant RM; 2000=100)

	No. of establishments	Mean value added	Mean employment	Mean gross output	Productivity	Gross output per worker	Wages per worker	Export intensity (%)
				in 2000				
Continuing exporters	1,416	240,917	330	999,470	729.5	3,026	158.9	77.62
Exiters from export markets	1,127	130,380	245	673,087	531.2	2,742	148.1	72.19
Entrants to export markets	567	168,688	190	518,294	886.4	2,723	144.7	0.00
Continuing non-exporters	8,584	18,768	41	60,420	458.4	1,476	132.5	0.00
All surviving exporters	2,543	191,929	293	854,824	655.8	2,921	154.9	75.72
All surviving non-exporters	9,151	28,057	50	88,790	558.9	1,769	135.4	0.00
All survivors	11,694	63,693	103	255,373	618.8	2,481	147.5	55.12
Exiting exporters	751	82,888	195	557,519	426.1	2,866	147.5	77.14
Exiting non-exporters	7,635	9,619	25	36,224	378.9	1,427	125.5	0.00
All exiters	8,386	16,181	41	82,908	399.2	2,046	135.0	46.45
All exporters	3,294	167,069	270	787,042	618.1	2,912	153.7	75.95
All non-exporters	16,786	19,671	39	64,881	505.5	1,667	132.5	0.00
All in 2000	20,080	43,850	77	183,347	570.5	2,385	144.7	53.48
				in 2005				
Continuing exporters	1,416	245,338	354	1,407,243	693.8	3,979	174.4	80.87
Exiters from export markets	1,127	127,896	244	732,639	524.2	3,003	170.7	0.00
Entrants to export markets	567	162,967	206	587,774	789.3	2,847	156.0	70.73
Continuing non-exporters	8,584	20,468	42	72,197	484.9	1,710	143.2	0.00
All surviving exporters	1,983	221,785	312	1,172,932	711.9	3,765	170.9	79.41
All surviving non-exporters	9,711	32,936	66	148,844	501.9	2,268	155.1	0.00
All survivors	11,694	64,960	107	322,503	605.2	3,005	162.9	48.98
Entering exporters	932	89,443	132	407,500	677.9	3,089	156.9	80.06
Entering non-exporters	15,468	8,094	18	33,777	447.7	1,868	126.1	0.00
All entrants	16,400	12,717	25	55,015	518.0	2,241	135.5	33.70
All exporters	2,915	179,472	254	928,204	706.2	3,653	168.6	79.50
All non-exporters	25,179	17,675	36	78,156	485.3	2,146	146.2	0.00
All in 2005	28,094	34,463	59	166,356	584.1	2,819	156.2	46.03

Source: Calculated by using the data obtained from the Department of Statistics, Malaysia.

Note: Productivity is calculated as value added over employment; export intensity is defined as value of exports over gross output; survivors are establishments that operated in both years.

Table 6: Average labour productivity of manufacturing establishments

	Productivity in 2000[a]	Productivity in 2005[a]	% of productivity in 2000		Growth rate[b]
	(RM)	(RM)	Productivity in 2000	Productivity in 2005	(%)
Continuing exporters	729.52	693.76	100.00	95.10	-4.90
Exiters from export markets	531.17	524.16	72.81	71.85	-1.32
Entrants to export markets	886.36	789.30	121.50	108.19	-10.95
Continuing non-exporters	458.40	484.93	62.84	66.47	5.79

Source: Calculated by using the data obtained from the Department of Statistics, Malaysia.
Notes: [a]Total group value added over total group employment; [b]difference in end and beginning period values as a percentage of the beginning period value; survivors are establishments that operated in both years.

Table 7: Decomposition of productivity growth, 2000-2005

	Contribution to aggregate productivity growth		As a percentage of total growth rate of 2.38%	
	FHK	GR	FHK	GR
Survivors				
Continuing exporters	-1.92	-1.92	-80.52	-80.48
Exiters from export markets	-0.11	-0.10	-4.71	-4.04
Entrants to export markets	-1.16	-1.16	-48.79	-48.83
Continuing non-exporters	1.20	1.21	50.21	50.66
All survivors *(1)*	-2.00	-1.97	-83.81	-82.68
Entrants (new establishments)				
Exporters	1.40	1.31	58.67	54.96
Non-exporters	-3.63	-3.83	-152.37	-160.81
All entrants *(2)*	-2.23	-2.52	-93.71	-105.85
Exiters (failed establishments)				
Exporters	-2.39	-2.51	-100.51	-105.24
Non-exporters	-4.22	-4.37	-177.01	-183.29
All exiters *(3)*	-6.61	-6.87	-277.52	-288.53
Net entry				
Exporters	3.79	3.82	159.18	160.20
Non-exporters	0.59	0.54	24.64	22.48
Total net entry (4)	4.38	4.35	183.81	182.68
All *(1+4)*	2.38	2.38	100.00	100.00

Source: Authors' calculations.

Note: Survivors are establishments that operated in both years.

Table 8: Contribution of survivors to aggregate productivity growth, 2000-2005

	Within	Between	Cross	Total
		FHK		
Continuing exporters	-0.53	1.20	-2.59	-1.92
Exiters from export markets	-0.24	1.20	-1.08	-0.11
Entrants to export markets	-1.68	1.06	-0.55	-1.16
Continuing non-exporters	1.04	1.90	-1.75	1.20
All	-1.40	5.37	-5.96	-2.00
	as a percentage of total growth rate of 2.38%			
Continuing exporters	-22.1	50.3	-108.8	-80.6
Exiters from export markets	-10.1	50.6	-45.2	-4.7
Entrants to export markets	-70.4	44.7	-23.1	-48.8
Continuing non-exporters	43.9	79.9	-73.5	50.3
All	-58.7	225.5	-250.6	-83.9
		GR		
Continuing exporters	-1.82	-0.10		-1.92
Exiters from export markets	-0.78	0.68		-0.10
Entrants to export markets	-1.95	0.79		-1.16
Continuing non-exporters	0.17	1.04		1.21
All	-4.38	2.41		-1.97
	as a percentage of total growth rate of 2.38%			
Continuing exporters	-76.5	-4.1	0.0	-80.6
Exiters from export markets	-32.7	28.6	0.0	-4.0
Entrants to export markets	-82.0	33.1	0.0	-48.9
Continuing non-exporters	7.1	43.6	0.0	50.7
All	-184.0	101.3	0.0	-82.8

Source: Authors' calculations.

Note: Survivors are establishments that operated in both years.

Appendix 1 – Selected Incentives for the Manufacturing Sector and Related Incentives

(From information obtained at the website of the Malaysian Industrial Development Authority - www.mida.gov.my)

Incentives for Investments

- Main Incentives for Manufacturing Companies
  - Pioneer Status
  - Investment Tax Allowance
- Incentives for Relocating Manufacturing Activities to Promoted Areas
- Incentives for High Technology Companies
- Incentives for Strategic Projects
- Incentives for Small and Medium-Scale Companies
- Incentives to Strengthen Industrial Linkages
- Incentives for the Machinery and Equipment Industry
- Incentives for the Production of Specialized Machinery and Equipment
- Incentives for Automotive Component Modules

Additional Incentives for the Manufacturing Sector

- Reinvestment Allowance
- Accelerated Capital Allowance
- Accelerated Capital Allowance on Equipment to Maintain Quality of Power Supply
- Incentive for Industrialized Building System
- Tax Exemption on the Value of Increased Exports

Incentives for Research and Development

- Contract R&D Company
- R&D Company

- In-house Research
- Incentives for Commercialization of Public Sector R&D
- Double Deduction for Research and Development
- Incentives for Researchers to Commercialize Research Findings

Incentives for Training

- Incentives for Unemployed Graduate Training Scheme
- Deduction for Pre-employment Training
- Special Industrial Building Allowance
- Tax Exemption on Educational Equipment
- Double Deduction for Approved Training
- Human Resource Development Fund

Incentives for the use of Information and Communication Technology (ICT)

- Accelerated Capital Allowance
- Deduction of Operating Expenditure
- Tax Exemption on the Value of Increased Exports

Tariff Related Incentives

- Exemption from Import Duty on Raw Materials/Components
- Exemption from Import Duty and Sales Tax on Machinery and Equipment
- Exemption from Import Duty and Sales Tax on Spares and Consumables
- Exemption from Import Duty and Sales Tax for Outsourcing Manufacturing Activities
- Exemption from Import Duty and Sales Tax for Maintenance, Repair and Overhaul (MRO) Activities
- Exemption from Import Duty and Sales Tax on Energy Efficiency Equipment
- Sales Tax Exemption
- Drawback on Import Duty, Sales Tax and Excise Duty

Incentives for Export

- Single Deduction for the Promotion of Exports
- Double Deduction for the Promotion of Exports
- Double Deduction on Export Credit Insurance Premiums
- Double Deduction on Freight Charges
- Double Deduction for the Promotion of Malaysian Brand Names
- Special Industrial Building Allowance for Warehouses