FOREIGN PRESENCE AND MARKET CONCENTRATION IN MALAYSIAN MANUFACTURING INDUSTRIES: A SIMULTANEITY TEST

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ABSTRACT

This paper examines the relationship between foreign presence and market concentration and thus competition in the Malaysian manufacturing sector by looking at its respective determinants. Using a panel of aggregate 5-digit Malaysian manufacturing industries for 2001-04, different extents and proxies of foreign presence are utilized to test the hypothesis that higher foreign presence leads to more concentrated market. The single equation results show that foreign presence in terms of fixed assets share has no significant impact on increasing the level of market concentration while higher foreign presence in an industry in terms of both value added and employment shares significantly contributes towards more concentrated markets. On the other hand, a highly concentrated market is also one of the significant determinants for all proxies for foreign presence. In both instances, the extent of foreign shareholdings does not matter as much as the types of proxy used to measure foreign presence. However, a system of four equations including market concentration (under the Structure-Conduct-Performance framework) and foreign presence estimated using Two-Stage Least Squares (2SLS) with fixed effects. shows no significant evidence to support the existence of simultaneity between market concentration and foreign presence.

Key words : market concentration; foreign presence; competition.

1. Introduction

As part of the greater issue of whether a host economy benefits indirectly from foreign ownership of firms, the literature on indirect technology transfer states that the possibility of technology transfer exists through the competition effect which is one of the main channels of productivity spillovers (Yun and Lee 2001). The presence of foreign multinational corporations (MNCs) with better technologies will spur the local counterparts to compete by improving their efficiency – the so-called positive competitive effects. Thus, in the short run, the entry of foreign firms into industries with relatively high barriers to entry may decrease market concentration. However in the long run, MNCs may contribute to a more concentrated market (negative competitive effects) as foreign monopolies may substitute for domestic ones by replacing local production and forcing local firms out of business.

Although studies on the direct impact of FDI or MNCs on the host country are well established in the literature, the uncertain and indirect effects of foreign presence specifically on local market competition are much more difficult to evaluate. MNCs are usually larger in size than local rivals (Rosenbluth 1970) and when combined with their possession of firm-specific advantages - technological, marketing and managerial superiority – may lead to increase concentration and non-competitive conduct in the market. At the same time, local firms in developing countries like Malaysia are much smaller on average than foreign ones in terms of average value added, capital intensity or value added per employee (Ramstetter 1999). Thus, competition in home markets is easily affected by foreign entry.

Compared to other rapidly industrializing economies Malaysia has since its independence always been open to FDI, as reflected by a very high FDI/GDP ratio of 57.2 in

2003 (as compared to neighbouring countries like 27.5 in Indonesia and 25.8 in Thailand both of which has also pursued a relatively open door policy to FDI). This raises a lot of questions on whether there is great concern in Malaysia about the impact of FDI on industrial concentration or whether there are mitigating factors which offset the adverse effect of high industrial concentration, such as the favourable technological spillover effects of the foreign presence on the development of technological capabilities of Malaysian domestic firms, and the access to export markets which FDI has provided to Malaysia's export-oriented industries[1]

There is ambiguity in what constitutes a foreign firm as defined in the various studies or by institutions. For example, both the Organization of Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF) define foreign firms, with an effective voice in management, as those firms having at least 10 per cent of the equity capital owned by foreigners. On the other hand, Haddad and Harrison (1993) consider those firms with at least 5 per cent equity owned by foreigners to be foreign firms. Djankov and Hoekman (1998) consider the relevant threshold to be 20 per cent whereas others like Koirala and Koshal (1999) readily accept any positive amount of foreign ownership. There is no clear-cut explanation for the various benchmark used in defining foreign firms except for the availability of data. Even the OECD states that their definition is only intended for the purpose of harmonization among the countries in publishing their industrial statistics.

Blomström and Sjoholm (1999) find no significant difference between majority and minority foreign ownership in the context of productivity spillovers in the Indonesian manufacturing sector (with foreign establishments define as those with 15 per cent and above foreign ownership stakes). On the other hand, Takii (2004) finds productivity differences are related to the level of foreign ownership whereby wholly foreign owned establishments are more productive compared to the other level of foreign ownership in Indonesian establishments. In order to understand the relationship between ownership and control of firm, Chhibber and Majumdar (1999; 2005) captures the influence of foreign ownership variations on the controls of property rights and exporting behavior of firms in Indian manufacturing. The extent of foreign shareholding is categorized according to the control exercisable at different levels of ownership. While operational control is possible with minority foreign ownership stakes, only majority or greater ownership gives unambiguous control over strategic long-term decision-making and property rights.

In line with previous studies on the indirect effects of FDI, the main objective of this paper is to study the effect of foreign ownership and control on the degree of industrial market concentration (and thus competition) in Malaysian manufacturing industries, and vice versa. By drawing upon market structure studies found in the industrial organization literature, the hypothesis being tested in this study is that a higher proportion of foreign control in an industry tends to increase the level of concentration in host country's industries, leading to less competition in the domestic market. Varying extent of foreign presence is introduced as a separate explanatory factor, and later on as an equation, to clarify the relationship of foreign presence with inter-industry differences in concentration levels in the manufacturing sector alongside the other determinants of market structure.

Another objective of this paper is to examine the simultaneity between concentration and foreign presence. As earlier studies like Gupta (1983), Delorme et al. (2002) and Resende (2007) already account for endogeneities between advertising, concentration and profitability under the Structure-Conduct-Performance (SCP) paradigm, this paper is particularly concerned about the direction of causality between market concentration and foreign

presence, whether concentrated markets attract foreign presence or foreign presence that causes concentrated markets. This is aside from the possibility of simultaneity of foreign presence with other main variables in the model. The study has important policy implications as it could help guide the regulatory authorities on the appropriate policy to increase overall competition and thus efficiency among firms in the domestic markets. At the same time, domestic firms need empowerment to combat stifling competition from foreign firms in the current move towards liberalized local economy.

The current country study differs from the earlier studies by combining three different research aspects. First, this study benefits from a recent, richer and more comprehensive pooled data set at the aggregate 5-digit industry level which allows us to account for the different extents and proxies of foreign presence. Second, the study utilizes a better methodology in terms of model specification; fixed effects (and random effects model) to account for the heterogeneity among the industries, simultaneous estimation using 2SLS method and the overall better measurement of variables using net output or value added instead of gross output. Third, the use of simultaneous equations allows us to test for the existence of bi-directional causality between concentration and foreign presence in the Malaysian economy.

The paper is organized as follows: Section 2 discusses briefly how FDI can influence market concentration and vice versa. It includes a review of selected studies on the market structure in Malaysia in particular the SCP approach. Section 3 describes the data and the models used. Section 4 presents the empirical results and Section 5 draws the main conclusion.

2. Literature Review

Industrial concentration is the most widely studied area among various elements of market structure in the industrial organization literature. In a study of the evolving industrial market structure in Malaysia at three different points of time; 1979, 1985 and 1990, Yusuf and Phang (1993) greatly emphasized on the need to increase competitiveness of Malaysian manufacturing industries. Nor Ghani et al. (2000) had examined the ten-year trends in the standard measures for market concentration (both 4-firm Concentration Ratio and Herfindahl Index) which suggest that a large proportion (between 40-45 per cent) of the Malaysian industrial sector had been evolving towards a more competitive environment (observed downward trends over time). The study used annual measures for 6 different market structure variables covering scale economies, product differentiation and market concentration, for 132 industries at the five-digit MIC (Standard Industrial Classification) level for 1985-94.

The determinants of market concentration are usually examined using the standard industrial organization's Structure-Conduct-Performance (SCP) framework. According to the traditional SCP paradigm, the higher the market concentration, the greater the possibility that firms will agree to collude, either tacitly or overtly, and raise prices above costs, therefore earning supernormal profits. This approach (Scherer, 1980) postulates a flow of causality from a market structure variable (concentration), through conduct (product differentiation variable – advertising), to performance (profitability as measured by the Price-Cost Margins, PCM). In the earliest study on the nature of the relationship between market concentration and PCM in Malaysian manufacturing industries, Gan and Tham (1977) implicitly assumed a unidirectional relationship from market concentration to PCM and ignored the analysis of determinants of concentration.

However, recent studies had shown that the exact causal relationship between industrial structures, the conduct of firms and their performance are more complex, suggesting the need

to take into account the simultaneity effects or two-way causality amongst the variables. The efficient structure hypothesis implies that firm-specific efficiencies arising from superior management, use of new technology and others, enable firms to increase their market share at the expense of other relatively inefficient firms, leading to market concentration. Example of studies on Malaysian manufacturing that consider the simultaneity between the key variables includes Rugayah (1992), where structure of the market is found to affect the behavior of firms and influences market performance, while performance simultaneously affects conduct and subsequently determines structure.

On a similar note, Nor Ghani et al. (2004) examine cross-section data of 120 manufacturing industries at the 5-digit level MIC for the year 1990 and provide considerable support to the feed-forward and feedback effects between concentration, advertising and profitability. Advertising intensity exerts a significant influence on profit and concentration in the industry and there exists a feedback effect running from concentration to advertising intensity. However, there are also studies which found no evidence of simultaneity amongst the variables. Kalirajan (1993) assumed uni-directional causality from foreign presence to market structure and ruled out simultaneity between concentration and PCM in the case of 50 selected Malaysian manufacturing industries in 1974.

There are two views in the literature regarding the relationship between openness to foreign investment and market structure. On the one hand, FDI is said to reduce the level of concentration and increase competition in the host countries, that is inverse relationship between FDI and concentration levels. Most empirical studies of developed countries show a negative correlation between FDI and concentration, indicating that entry of foreign subsidiaries has a pro-competitive effect in these economies (see Frischtak and Newfarmer 1994, for a survey). When there is an entry barrier (such as high sunk cost, economies of scale or technology sophistication), MNCs may be the best entity qualified to enter a market, and their entry may actually lower concentration and increase competition.

On the other hand, there are studies that note the positive relationship between the extent of foreign investment and the degree of market concentration in empirical studies (Dunning 1993; Caves 1996, for surveys). The few initial studies on the impact of MNCs on the structures of less developed host countries (LDCs) found that FDI increase the level of concentration and decrease competition. Lall (1979) finds a positive impact of FDI on market concentration in Malaysia, after controlling for other determinants of concentration such as capital intensity, advertising, market size, and economies of scale.

Blomström (1986) also finds that MNCs' presence is an independent source of concentration in Mexico. According to Blomström, developing countries have different industrial structures compared to developed countries. MNCs' advanced technology is developed for a large market to capture full scale economies and not for a relatively small market in LDCs. MNCs' firm-specific advantages (in knowledge, technology, organization, managerial or marketing skills) make competition too strong for existing local firms or raise the barriers to entry for local firms thus driving local competitors out of business and speeding up the concentration process. Similar studies for other developing countries show the same results. In the Indian manufacturing industries context (Athreye and Kapur, 1999), there is evidence that industrial concentration and foreign presence is positively correlated across industrial sectors.

Lall (1979) examines the impact of direct foreign investment on market concentration, but ignores the analysis of determinants of firms' performance. Using the SCP model to examine the determinants of market structure and how they affect performance of these industries, Rugayah (1993) found that FDI is not an important factor in influencing

performance of the selected 31 industries under study (without taking into account simultaneity bias). Both Gupta (1983) and Yun and Lee (2001) have specified and estimated simultaneous equation models involving concentration and foreign presence.

While Gupta (1983) finds that the simultaneity bias is important in the determinations of SCP pertaining to a cross section of Canadian manufacturing industries in 1968, Yun and Lee (2001) concludes that the simultaneity bias was not important and the single equation approach could not be rejected as an appropriate method of analysis. Yun and Lee (2001) also finds that FDI have an upward influence on concentration in a pooled data set on a cross-section of 13 industries for the years 1991-1997, confirming earlier studies for Korea. This particular issue of simultaneity bias between FDI and concentration merits further studies especially on Malaysia, a developing country that is keen on the open economy policy.

On the opposite direction of causality, that is, the effect of market concentration on foreign presence or foreign entry, Newfarmer and Marsh (1981) considers the determinants of the level of foreign investment in Brazil's electrical industry based on a sample of 87 Brazilian and 105 foreign firms. Their results show that market concentration and product differentiation (among other variables) are highly significant and positively affect the level of foreign ownership of an industry. Both Gupta (1983) and Yun and Lee (2001) also included the foreign ownership equation in their simultaneous equations model for structure, conduct and performance, respectively. While Gupta (1983) excludes the market concentration variable as one of the determinants of foreign ownership, Yun and Lee (2001) finds that market concentration is not significant in influencing foreign presence in their simultaneous estimations of concentration, foreign ownership and profitability.

A distinct characteristic of production in the Malaysian economy is the substantial amount of FDI involved. During the period of Eight Malaysian Plan (1996-2000), the value of Malaysia's exports and imports accounted for 119% and 101.7% of Gross National Product (GNP) respectively. Substantial amounts of intra-industry trade (IIT) in intermediate inputs in Malaysia especially in the electronic industries point to a neo-Heckscher Ohlin kind of IIT rather than the horizontal kind of IIT as characterized by the majority of North-North trade (Khalifah, 2000). In order to carefully delineate gross production (output or sales revenue) which is inclusive of intermediate inputs (both local and imported inputs) from net production or value added, all output variables used in the analysis for this paper are based on value added.

3. Data and Empirical Models

The empirical data for this study are gathered from the Malaysian Annual Survey of Manufacturing Industries for the period of 2000-2004. It is supplemented by unpublished data on foreign participation in the different industries as provided by the Department of Statistics, Malaysia (DOS). The data was collected at the establishment level and aggregated at the five-digit industry level using the Malaysian Industry Classification (MSIC 2000). DOS treats an establishment as foreign whereby at least 50% of its paid-up capital are foreign owned (according to the residential status of the owner(s)[2]).

Of the existing 191 five-digit industries, the following key variables are used: number of establishments, value of output, value added, fixed assets, advertising costs and employment figures. After taking into account missing observations due to combined industry codings, the study employs a pooled data set on a cross section of selected 174 five-digit industries for the

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[2] The ownership of an establishment is classified by the residential status of the owner(s) of the majority (more than 50%) of the paid-up capital and not by their citizenship status.

period 2001-2004. Due to the lack of suitable industry-specific deflators at the five-digit level, the relevant variables are adjusted for price changes using *Implicit Price Deflators of Value Added by Kind of Economic Activity (2007)* published by the Department of Statistics Malaysia, with the year 2000 chosen as the base year.

The study initially conducts a single equation estimation to investigate the impact of FDI on concentration (and vice versa) in Malaysian manufacturing industries. Aside from the common OLS, both FE and RE models are estimated to account for any unobservable industry specific effects, i.e. the heterogeneity of industries. In order to choose the best statistical model, the Likelihood Ratio (LR) test is used for comparing the OLS model against the FE model as well as the Hausman Specification (HS) test for the RE model against the FE model. This is followed by a simultaneous equations model that jointly determined the endogenous variables, where each endogenous variable can be a function of other endogenous variables as well as of exogenous variables and an error term, utilizing a set of four equations encompassing concentration, advertising, foreign presence and profitability as below. The one-way fixed effects (FE) model is used to estimate a simultaneous equations model by Two-Stage Least Squares (2SLS), which corresponds to an ordinary simultaneous equations model with a set of fixed effects in each equation. All the exogenous variables of the model are used as instruments in the two-stage least squares procedure.

In order to gauge the importance of the simultaneity bias in the Malaysian industries' foreign presence and concentration analysis, results of the simultaneous equations approach are compared with that of the single equations model. Furthermore, statistical testing of the simultaneity bias has also been attempted, i.e. Hausman specification test for the presence of simultaneity problem and endogeneity test for the endogenous variables, *ADVA*, *CR4V*, *FPVA* and *PCM*. Equations are also identified using the order condition (over-identified using the order conditions, suggesting the use of 2SLS). Two-stage least squares provides consistent single-equation parameter estimates (but still biased) when compared to OLS estimation. The full systems method of estimation (like 3SLS, which significantly improve the efficiency of estimation) is not undertaken in this study as individual parameter estimates (by construction) are sensitive to the specification of the entire model system. It must be noted that this SCP approach is not a fully developed theoretical model of competition and thus the quantitative results of this study must be interpreted with caution.

3.1. *Concentration equation*

Concentration is a measure of the degree to which a few large firms dominate an industry or market (either in terms of total sales, production or capacity). Concentration ratio (*CR4V*) as a dependent variable is measured by the market shares of four firms calculated at the aggregate 5-digits level using value added (net output) data. According to Blomström (1986), the inter-industry variation in the level of concentration is assumed to be a linear function of entry barrier variables, demand condition as follows:

$$CR4V_{it} = f(SIZE_{it}, GROW_{it}, MESV_{it}, KL_{it}, ADVA_{it}, FPVA_{it}) \tag{1}$$

where subscript i and t denote the industries and time period respectively and the dependent variable, market concentration, is measured by the four-firms concentration ratio (*CR4V*).

Major determinants of market concentration include entry barriers in terms of scale economies, capital intensity and advertising intensity. Opportunity to gain from economies of scale is measured as the ratio of the average size of the establishments which account for the top 50 per cent of the total industry value added to the total value added of the industry

(*MESV*). If there are significant economies of scale, an industry will only support a few efficient–sized firms. According to Kambhampati (2000), higher MES relative to industry output means few firms can be accommodated within the industry. In other words, this variable measures the number of firms that can efficiently be accommodated within the industry, and given the size of the market, whether the particular industry will be a highly or a lowly concentrated industry.

Capital intensity acts as an entry barrier in terms of the minimum amount of capital necessary for efficient production. It is measured as the ratio of total assets to the total number of employees in an industry (*KL*). Another entry barrier is in terms of product-differentiation. Advertising intensity (*ADVA*) is measured according to the ratio of advertising expenditure to the total output (value added) for each industry. Earlier studies (including Kambhampati, 1996) have also shown that advertising depends significantly on concentration ratios and profit margins in a three-equation model. A positive correlation between concentration and all these entry barriers are expected as higher capital intensity and product differentiation, leads to higher concentration.

Market size and market growth rates also affect the level of concentration as these reflect entry opportunities. The size of the market will determine the number of efficient sized firms needed while a fast-growing market demand would attract new firms to enter and allow incumbent firms to survive, with a resulting lower concentration. It is possible however for incumbent firms to fully take advantage of the growing market and thus leading to higher concentration. Market size is measured by value added (*SIZE*) in each industry and market growth rate (*GROW*) is measured as the percentage growth of value added of each industry in the period of 2000-2003.

In order to look at the issue of the impact of FDI on market structure and competition, another variable that might be significant in determining market concentration include the extent of foreign presence, defined as the foreign share of value added (*FPV*, in general) in each industry at the broad level (establishments with at least 10% foreign equity ownership, *F10V*),[3] value added share of majority foreign-owned establishments (above 50% foreign equity ownership, *F50V*) and value added share of wholly-owned foreign establishments (100% foreign equity ownership, *F100V*) respectively. Foreign entry into a highly monopolized local market may reduce the level of concentration and increase competition. However, it is also possible that foreign firms compete too strongly with existing local firms or raise the barriers to entry for local firms thus driving local competitors out of business and thus increasing the level of concentration.

Previous empirical studies (like Kohpaiboon, 2005) have used employment or capital shares to measure foreign presence. Expressing foreign presence as an employment share tends to underestimate the actual role of foreign affiliates because MNE affiliates tend to be more capital intensive than locally non-affiliated firms. On the other hand, the capital share can easily be distorted by the presence of foreign ownership restrictions. Hence, the net output share is the preferred proxy for foreign presence in this study.

3.2. *Advertising equation*

According to Comanor and Wilson (1967) and Schmalensee (1972), advertising intensity may be determined by the market concentration and price-cost margin. The higher the price-cost margin, the higher is the profitability of an additional unit sold due to additional advertising, and hence *ADVA* may be positively related with price-cost margin. The presence of foreign

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[3] The 10% threshold is not arbitrarily chosen. It is based on the OECD definition.

firms may be expected to give an upward influence on advertising intensity. Foreign firms have a higher propensity to advertise in order to maintain and enhance their differentiated product. The higher the existing capital requirement entry barrier, the smaller is the need to spend on advertising.

$$ADVA=f(CR4V, FPVA, PCM,) \qquad (2)$$

3.3. Profitability equation

Market performance in terms of price-cost margins is measured by gross profits (value added minus wage) as a proportion of sales. Differences in market performance as represented by the profitability ratio are influenced by various elements of market structure and conduct. Aside from foreign ownership levels, several control variables need to be introduced. The level of market concentration reflects the competitive condition of each industry. Advertising as a general entry barrier can lead to product differentiation and lead to greater profitability. Industry heterogeneity is accounted for by the capital-output ratio (*KOVA*) to control for differences in capital intensity across industries. *GROW* capture the general business climate faced by the firms in the market using the ratio of current year to previous year's value added.

$$PCM=f(CR4V, KOVA, FPVA, GROW) \qquad (3)$$

Concentration ratio, capital requirement entry barrier, foreign presence and expanding markets are all expected to positively influence price-cost margins. In this case, foreign presence encourages firms, in general, to be more efficient and thus increasing profitability. *FPVA* would be negatively associated with *PCM* if it acts as a competitive force in the developing countries' market.

3.4. Foreign ownership equation

Based mainly on the model used by Newfarmer and Marsh (1981), the hypothesis that industrial structure exerts an independent influence on foreign ownership is tested using the following linear equation:

$$FPVA_{it}=f(SIZE_{it}, ADVA_{it}, WBC_{it}, KOVA_{it}, VI_{it}, CR4V_{it}) \qquad (4)$$

where subscript i and t denote the industries and time period respectively and the dependent variable, *FPVA*, represents foreign ownership as explained earlier.

Foreign presence is taken to be positively determined by the host country's market size (*SIZE*); entry barriers in terms of product differentiation (*ADVA*) and capital intensity (*KOVA*) measured as the ratio of fixed assets to value added; labor quality (*WBC*); concentration level (*CR4V*) and vertical integration (*VI*) which is measured as the ratio of value added to total output. Here, vertical integration refers to the extent to which a single business unit is involved in successive stages in the production of a product. Firms may integrate vertically and this may act as an entry barrier along with larger capital requirements. Nor Ghani et al. (2006) finds that with significant presence of foreign multinationals in Malaysia, the degree of foreign participation negatively affects vertical integration. However, using data for 129 industries at the five-digit MIC for 1989 and 1992, foreign participation is measured as the proportion of industry output accounted for by foreign firms, regardless of the amount of foreign-owned equity.

4. Estimation Results

The following empirical analysis is based on 174 manufacturing industries (at the 5-digit level of the MSIC) in Malaysia for the year 2001-2004. Single-equation determinants of market concentration and foreign presence are individually estimated. his is followed by the four-equation system estimation of the Structure-Conduct-Performance approach with foreign presence. Foreign employment and fixed assets shares are used alternately as proxies for foreign presence.

4.1 *Determinants of market concentration*

Table 1 presents regression results for the concentration equation using each of the OLS, RE and FE models. Regression *1a* (OLS) examines the determinants of market concentration without taking into account the individual characteristics of each industry while regressions *1b* and *1c* (RE and FE models respectively) specify the industry specific effects accordingly. In the OLS model, all the independent variables (except for the market growth rate, *GROW*) are significant in determining market concentration of each industry. Higher capital intensity, advertising intensity, scale economies and foreign presence all contribute towards more concentrated market while larger market size lowers the market concentration. Given the diverse explanatory variables included in past empirical studies, the choice of independent variables as above is based upon the Cp Mallow statistics.

As for the random effect model in regression *1b* (Table 1), the significant Hausman test statistics (at the 5% level) indicates that the usage of the FE model is more appropriate than the RE model. The LR test statistics for regression 4 (Table 1) also suggests that the FE model is preferred to the OLS model. These results lead to the conclusion that the FE specification is the best statistical model for the data set. The explanatory power of the FE estimation is also higher (R-square = 0.97) compared to that of the OLS and RE estimations. Regression *1c* presents the result of a feasible Generalised Least Squares (EGLS) specification estimated using cross section weights to account for the possibility of cross-section heteroskedasticity which produce largely the same result with FE. Hereinafter, only the results of the FE models estimation will be discussed.

The results of the fixed effects model in regression *1d-1f* (Table 1) show that market concentration is positively determined by both scale economies (*MESV*) of the industries and capitalistic intensity (*KL*) which acts as an entry deterrent along with size of the domestic market (*SIZE*). The independent variable of main interest, foreign presence, in terms of broad foreign-owned firms' share of industry value added (*F10V*), is also positively significant in explaining market concentration of the selected Malaysian manufacturing industries. This result supports the hypothesis that the higher the foreign presence the more concentrated the market will be, implying less competition among firms in the industry. Other determinant of market concentration, in terms of market growth rate (*GROW*) is also significant and negatively influencing market concentration. However, after accounting for industry-specific effects, advertising intensity (*ADVA*) is no longer significant in affecting market concentration.

In regression *1e* and *1f* (Table 1), the broad measure of foreign presence (*F10V*) is substituted with majority foreign presence (*F50V*) and foreign presence in terms of establishments with 100% foreign equity ownership (*F100V*) respectively. The results show that majority foreign presence (*F50V)* significantly determined market concentration but not for the wholly foreign-owned firms' share of industry value added (*F100V*). All the other independent variables show the same results as before in term of significance levels. The overall results show that while restricting the definition of foreign presence to wholly foreign-

owned firms has no significant impact on increasing the level of concentration in the Malaysian manufacturing industries, higher foreign presence loosely defined in terms of the broad and majority foreign-owned firms significantly contributes towards a more concentrated market.

Table 1: Determinants of market concentration

Dependent variable: *CR4V* (with foreign presence in terms of value added, *FPV*)

Variable	a. OLS	b. RE	c. EGLS	d. FE	e. FE	f. FE
C	0.714[a]	0.694[a]	0.095	0.078	0.074	0.066
	(18.46)	(12.94)	(1.61)	(0.72)	(0.69)	(0.61)
SIZE	-0.050[a]	-0.045[a]	0.018[a]	0.020[b]	0.019[b]	0.021[b]
	(-13.78)	(-9.63)	(3.96)	(2.21)	(2.19)	(2.39)
ADVA	0.393[a]	-0.182	-0.480[a]	-0.310	-0.311	-0.260
	(2.65)	(-1.09)	(-4.15)	(-1.43)	(-1.43)	(-1.20)
GROW	-0.003	0.003	-0.008[a]	-0.008[b]	-0.008[b]	-0.008[b]
	(-0.49)	(0.80)	(-2.34)	(-2.23)	(-2.28)	(-2.33)
KL	0.059[a]	0.067[a]	0.044[a]	0.041[a]	0.043[a]	0.042[a]
	(10.32)	(8.74)	(6.95)	(3.02)	(3.16)	(3.08)
MESV	0.807[a]	0.527[a]	0.327[a]	0.360[a]	0.369[a]	0.370[a]
	(32.23)	(22.36)	(23.86)	(12.78)	(13.32)	(13.22)
F10V	0.097[a]	0.077[a]	0.057[a]	0.055[a]		
	(5.51)	(4.27)	(5.61)	(2.46)		
F50V					0.055[b]	
					(2.12)	
F100V						0.035
						(1.20)
R^2	0.784	0.495	0.995	0.966	0.966	0.965
Adj R^2	0.782	0.491	0.994	0.954	0.954	0.953

Note: Estimated coefficients are shown together with the value of the t-statistics in parentheses. *a, b* and *c* denote statistical significance at 1, 5 or 10 per cent levels respectively. Assuming the presence of cross-section heteroskedasticity, a feasible GLS specification (EGLS) is estimated using cross section weights in regression (c). Comparison of regressions (a), (b) and (d); high values of LM statistics (=1280.8 with 1 df, prob value = .00) favor FE/RE over OLS model and high values of the Hausman test statistics for Fixed vs. Random Effects, H = … (6 df, prob value =.00) favor FE.

Table 2 presents the fixed effect estimation results of the determinants of market concentration with foreign presence defined in terms of employment shares. The tests for the best-fitting model still suggest for application of fixed effect model and the results are mostly similar with the earlier proxy of foreign value added shares. The only exception in the results is that all three extent of foreign ownership measured in terms of employment shares are positively significant in explaining market concentration. Here, foreign presence measured strictly as 100 per cent foreign-owned establishments has also the impact of increasing the degree of market concentration.

Table 2: Determinants of market concentration

Dependent Variable: *CR4V* (with foreign presence in terms of employment, *FPL*)

Variable	a. OLS	b. RE	c. EGLS	d. FE	e. FE	f. FE
C	0.711[a]	0.679[a]	0.052	0.050	0.041	0.057
	(18.28)	(12.72)	(0.90)	(0.46)	(0.38)	(0.52
SIZE	-0.050[a]	-0.043[a]	0.024[a]	0.022[a]	0.023[a]	0.023[a]
	(-13.57)	(-9.33)	(5.46)	(2.55)	(2.57)	(2.58)
ADVA	0.434[a]	-0.141	-0.438[a]	-0.276	-0.279	-0.250
	(2.92)	(-0.85)	(-4.03)	(-1.28)	(-1.29)	(-1.16)
GROW	-0.002	0.003	-0.008[a]	-0.008[b]	-0.009[b]	-0.009[b]
	(-0.39)	(0.81)	(-2.49)	(-2.30)	(-2.40)	(-2.41)
KL	0.059[a]	0.067[a]	0.039[a]	0.039[a]	0.041[a]	0.039[a]
	(10.25)	(8.62)	(6.44)	(2.92)	(3.05)	(2.86)
MESV	0.812[a]	0.535[a]	0.324[a]	0.363[a]	0.371[a]	0.371[a]
	(32.55)	(23.08)	(22.78)	(13.05)	(13.49)	(13.43)
F10L	0.091[a]	0.060[a]	0.052[a]	0.054[a]		
	(5.13)	(3.69)	(7.66)	(2.81)		
F50L					0.060[a]	
					(2.67)	
F100L						0.046[c]
						(1.74)
R²	0.782	0.491	0.996	0.966	0.966	0.965
Adj *R²*	0.781	0.487	0.994	0.954	0.954	0.953

Note: Estimated coefficients are shown together with the value of the t-statistics in parentheses. *a, b* and *c* denote statistical significance at 1, 5 or 10 per cent levels respectively. Assuming the presence of cross-section heteroskedasticity, a feasible GLS specification (EGLS) is estimated using cross section weights weights for regression (c). Comparison of regressions (a), (b) and (d); high values of LM statistics (=1280.8 with 1 df, prob value = .00) favor FE/RE over OLS model and high values of Hausman test statistics for Fixed vs. Random Effects, H = (6 df, prob value =.00) favor FE.

Subsequently, Table 3 shows the fixed effect estimation results using another proxy of foreign presence, the fixed assets shares. While the other independent variables remain the same in terms of signs and significance, all three extents of foreign presence are now not significant in affecting market concentration. The difference in the results, comparing proxies of foreign presence either in terms of employment or fixed assets shares, points to the obvious nature of foreign presence in the Malaysian industries which are prevalently more labour-intensive and thus easily captured by foreign employment shares.

In general, we find mixed evidence for the effect of foreign presence on market concentration depending upon the particular proxies of foreign presence used. While foreign value added shares produce similar results with foreign employment shares in positively determining market concentration, the same can not be said of foreign fixed assets share. Narrowing the measurements of foreign presence from broad to majority and wholly foreign-owned also affects the significance of the results in the particular case of foreign value added shares.

Table 3: Determinants of market concentration

Dependent Variable: *CR4V* (with foreign presence in terms of fixed assets, *FPK*)

Variable	a. OLS	b. RE	c. EGLS	d. FE	e. FE	f. FE
C	0.714[a]	0.700[a]	0.105[c]	0.075	0.067	0.066
	(18.44)	(12.94)	(1.82)	(0.69)	(0.61)	(0.61)
SIZE	-0.050[a]	-0.046[a]	0.018[a]	0.020[b]	0.021[b]	0.022[b]
	(-13.76)	(-9.65)	(3.98)	(2.25)	(2.38)	(2.42)
ADVA	0.425[a]	-0.168	-0.419[a]	-0.262	-0.251	-0.248
	(2.87)	(-1.00)	(-4.24)	(-1.20)	(-1.15)	(-1.13)
GROW	-0.002	0.003	-0.006[c]	-0.008[b]	-0.008[b]	-0.008[b]
	(-0.39)	(0.92)	(-1.89)	(-2.23)	(-2.30)	(-2.31)
KL	0.060[a]	0.068[a]	0.043[a]	0.042[a]	0.042[a]	0.042[a]
	(10.42)	(8.78)	(6.82)	(3.10)	(3.11)	(3.10)
MESV	0.805[a]	0.534[a]	0.344[a]	0.374[a]	0.375[a]	0.376[a]
	(31.98)	(22.96)	(27.74)	(13.49)	13.56)	(13.60)
F10K	0.104[a]	0.084[a]	0.020[b]	0.015		
	(5.48)	(4.33)	(2.02)	(0.62)		
F50K					0.006	
					(0.25)	
F100K						0.004
						(0.13)
R^2	0.784	0.496	0.995	0.965	0.965	0.965
Adj R^2	0.782	0.491	0.994	0.953	0.953	0.953

Note: Estimated coefficients are shown together with the value of the t-statistics in parentheses. *a, b* and *c* denote statistical significance at 1, 5 or 10 per cent levels respectively. Assuming the presence of cross-section heteroskedasticity, a feasible GLS specification (EGLS) is estimated using cross section weights. High values of LM statistics (=1280.8 with 1 df, prob value = .00) favor FE/RE over OLS model. High values of Hausman test statistics for Fixed vs. Random Effects, H = (6 df, prob value = .00) favor FE.

4.2 *Determinants of foreign presence*

Table 4 presents the results of estimating foreign presence equation using foreign value added shares (*FPV*), employment (*FPL*) and fixed assets (*FPK*) respectively as the proxies for foreign presence under the fixed effects model. For each of the proxies, three different extents of foreign shareholdings in terms of broad (10% and above, *F10*), majority (above 50%, *F50*) and wholly foreign-owned (100%, *F100*), as described earlier, are used in measuring foreign presence in the industries.

Using the proxy of value added shares (*FPV*), the first part of Table 4 shows that only advertising expenditure and market concentration are positively significant in affecting foreign presence in the Malaysian manufacturing industries. Highly concentrated market and greater advertising expenditure encourage greater foreign presence since both act as entry barrier and point outs to highly differentiated products with little competition in the local market. Under the majority ownership's measure of foreign presence (*F50V*), the results show the significance of capital-output ratio in attracting foreign presence. Lower capital-output ratio attracts greater foreign direct investment while market size (*SIZE*), labor quality (*WBC*) and degree of vertical integration (*VI*) altogether are still not significant in affecting the majority measure of foreign presence.

Table 4: Determinants of foreign presence

Dependent Variable: 3 proxies for foreign presence and 3 extent of foreign shareholding

Variable	*F10V*	*F50V*	*F100V*	*F10L*	*F50L*	*F100L*	*F10K*	*F50K*	*F100K*
C	-0.02	0.08	0.03	0.43[c]	0.41c	0.26	-0.35c	-0.04	-0.12
	(-0.10)	(0.41)	(0.20)	(1.71)	(1.89)	(1.37)	(-1.69)	(-0.22)	(-0.69)
SIZE	0.02	0.01	0.01	-0.02	-0.02	-0.01	0.06[a]	0.03[a]	0.03[a]
	(0.99)	(0.84)	(0.62)	(-1.14)	(-1.07)	(-0.59)	(3.62)	(2.05)	(2.19)
KOVA	-0.02	-0.03[a]	-0.01	-0.01	-0.01	0.00	-0.01	-0.01	0.00
	(-1.35)	(-2.85)	(-1.17)	(-0.41)	(-0.79)	(-0.39)	(-0.48)	(-1.10)	(0.19)
ADVA	1.57[a]	1.44[a]	0.69[b]	0.80	0.69	0.25	1.23[a]	1.03[a]	0.92[a]
	(3.74)	(4.02)	(2.11)	(1.66)	(1.67)	(0.72)	(3.11)	(2.88)	(2.92)
CR4V	0.35[a]	0.20[a]	0.18[a]	0.38[a]	0.23[a]	0.18[a]	0.12	0.07	0.03
	(4.66)	(3.11)	(3.06)	(4.45)	(3.18)	(2.91)	(1.67)	(1.02)	(0.57)
WBC	0.00	0.02	0.02	-0.04	0.03	0.03	-0.02	0.00	0.00
	(-0.14)	(0.95)	(0.97)	(-1.19)	(1.07)	(1.41)	(-0.58)	(-0.16)	(0.05)
VI	0.17	0.01	-0.07	0.03	-0.16	-0.25[b]	-0.07	-0.18	-0.19[c]
	(1.25)	(0.09)	(-0.66)	(0.22)	(-1.25)	(-2.24)	(-0.54)	(-1.61)	(-1.90)
R^2	0.91	0.93	0.92	0.87	0.90	0.90	0.90	0.92	0.92
Adj. R^2	0.87	0.90	0.90	0.87	0.86	0.87	0.87	0.89	0.89

Note: Estimated coefficients are shown together with the value of the t-statistics in parentheses. *a, b* and *c* denote statistical significance at 1, 5 or 10 per cent levels respectively. For simplicity, only the results of fixed effects regressions are shown here. Careful of interpretation the results is required as the same set of explanatory variables are used to explain the various dependent variables.

The second part of Table 4 presents the results of estimating foreign presence equation using employment shares (*FPL*) as a proxy for foreign presence. For all three different extent of foreign shareholdings, only market concentration variable is significant in explaining foreign presence. Again, this perhaps concurs with the fact that MNCs are investing in local production based on assembly-line method of production which are mostly labour intensive. These large MNCs are mainly taking advantage of the availability of relatively cheap labor but not necessarily due to better quality of skilled workers. Market size, capital intensity, labor quality, advertising expenditure and the degree of vertical integration are found to be not significant to explain foreign presence in the manufacturing industries. Advertising expenditure (*ADVA*) is not significant in explaining foreign presence. There is no product differentiation effects, as if the industries are producing intermediate products for export where advertising is redundant.

The final part of Table 4 presents the result of estimating the foreign presence equation using fixed assets share *(FPK)* as a proxy for foreign presence. For all three different extent of foreign shareholdings, both size of the market and advertising expenditure significantly affect foreign presence. Each of the larger market size and greater spending on product differentiation contribute towards increasing foreign presence in the industry, respectively. *ADVA* is important perhaps for industries producing finished goods that are being marketed locally. At the same time, the results show that capital intensity, market concentration, labor quality and the degree of vertical integration are not significant in explaining foreign presence in the particular industry.

However, there is an exception in the case of wholly foreign-owned establishments measure of foreign presence in terms of both employment and fixed assets shares. There is significant evidence of lower degree of vertical integration influencing foreign presence when

foreign presence is measured based on wholly foreign owned establishemnts in that particular industry. With vertical integration measured as the proportion of value added to gross output, MNCs are commonly perceived to import intermediate products sourced from their parent company or subsidiaries elsewhere and assembled locally before exporting again. As opposed to vertical integration, in which production occurs within a singular organization (MNCs and its local affiliates), vertical disintegration (or outsourcing) is important in determining foreign presence for both *F100K* and *F100L.*

Overall, domestic market size is an important explanatory variable where foreign presence is proxied in terms of fixed assets share is concerned but not for *FPL*. Foreign presence in terms of employment shares is not serving the local market but foreign markets. Market power (*CR4V*) is important when foreign presence is measured in terms of value added and employment shares but unimportant when foreign presence is measured in terms of fixed assets. These results perhaps can be explained again by the earlier argument that foreign companies are coming to Malaysia mainly to take advantage of the locational factors in terms of cheap labor (especially those involving assembly line production and imported intermediate inputs)and these establishments are concentrated. Within each proxy (referring to its respective columns of Table 4), the results are still the same even after restricting the measurement of foreign presence from broad foreign shares to majority foreign shares and wholly foreign-owned shares.

In sum, these analyses perhaps suggest that there are significant differences among the proxies (but not the extent) of foreign presence, even after controlling for capital intensity, market size, scale economies and other explanatory variables. The results show that the level of market concentration have significant impact on increasing foreign presence in the Malaysian manufacturing industries only if measured in terms of value added and employment shares.

4.3. *Simultaneous equations: SCP with foreign presence*

Based on the obvious difference in results of single equations estimation of market concentration and foreign presence, using the different proxies and extent of foreign ownership; we now estimate simultaneous equations model using both foreign shares of an industry's employment (*FPL*) and fixed assets (*FPK*) as the proxies for foreign presence. Each of the following Table 5 and 6 presents the 2SLS panel estimates (with fixed effects) of the market concentration and foreign presence equations as part of a system of four equations under the SCP approach, together with the two different proxies and the various extents of foreign presence.

Aside from testing the SCP paradigm, the study is also examining in particular the feedback effects that run between market concentration and foreign presence. The equations are over-identified using the order condition and all exogenous variables in the system are used as instruments in the first stage of estimation. The OLS estimates for each of the concentration equation and broad foreign presence in the system are approximately the same with those of the previous single equations analysis and thus not shown here (results are available upon request). For the 2SLS, all exogenous variables are used as instruments.

Table 5 reports the 2SLS results of system estimations based on the foreign employment shares as the proxy for foreign presence (*FPL*). In the concentration equation, only capitalistic intensity and scale economies are positively significant while advertising intensity is found to be negative and significant once the industry effects are taken care of. Thus, greater scale economies and higher capital intensity continue to act as an entry barrier that encourage higher market concentration while greater product differentiation in terms of

advertising intensity lowers the market concentration. After simultaneity is taken care of, foreign presence in terms employment shares has no concentrating effect in the manufacturing industries.

Table 5: FE-2SLS estimations of the simultaneous equations model using *FPL*

Var.	ADVA	F100L	F50L	F10L	KL	MESV	SIZE	GROW	R^2	Adj R^2
CR4V_1	-3.71[b]	-0.05			0.05[a]	0.46[a]	0.003	-0.004	0.97	0.95
	(-1.99)	(-0.24)			(2.65)	(8.23)	(0.25)	(-0.87)		
CR4V_2	-3.81[b]		-0.09		0.05[a]	0.46[a]	0.002	-0.004	0.97	0.95
	(-1.98)		(-0.31)		(3.30)	(7.30)	(0.16)	(-0.82)		
CR4V_3	-3.89[b]			0.26	0.03[c]	0.39[a]	0.01	-0.004	0.97	0.95
	(-2.11)			(1.04	(1.86)	(5.10)	(0.64)	(-0.82)		

Var.	CR4V	F100L	F50L	F10L	PCM	R^2	Adj R^2
ADVA_1	0.07[a]	-0.03			-0.06[a]	0.90	0.87
	(3.43)	(-0.82)			(-3.00)		
ADVA_2	0.05[a]		0.01		-0.05[b]	0.90	0.87
	(2.49)		(0.17)		(-2.40)		
ADVA_3	-0.01			0.26[a]	-0.04[a]	0.90	0.87
	(-0.25)			(1.04)	(-2.54)		

Var.	CR4V	ADVA	SIZE	KOVA	VI	WBC	R^2	Adj R^2
F100L	0.40[c]	-0.69	-0.02	-0.005	-0.30[c]	0.03	0.90	0.87
	(1.76)	(-0.22)	(-0.87)	(-0.41)	(-2.11)	(0.79)		
F50L	0.17	2.09	-0.01	-0.01	-0.13	0.04	0.90	0.86
	(0.64)	(0.56)	(-0.62)	(-0.85)	(-0.77)	(1.08)		
F10L	0.74[b]	-0.12	-0.03	-0.01	-0.05	-0.05	0.87	0.83
	(2.38)	(-0.03)	(-1.29)	(-0.49)	(-0.24)	(-1.10)		

Var.	CR4V	F100L	F50L	F10L	GROW	KOVA	R^2	Adj R^2
PCM_1	0.44[a]	-0.90[a]			0.002	-0.03[a]	0.93	0.90
	(11.55)	(-13.33)			(1.46)	(-10.32)		
PCM_2	0.54[a]		-1.51[a]		0.001	-0.03[a]	0.93	0.91
	(13.76)		(-15.38)		(0.88)	(-12.10)		
PCM_3	0.34[a]			-0.22[b]	-0.001	-0.03[a]	0.90	0.87
	(4.26)			(-2.13)	(-0.86)	(-10.90)		

Note: Estimated coefficients are shown together with the value of the t-statistics in parentheses. *a, b* and *c* denote statistical significance at 1, 5 or 10 per cent levels respectively.

As for the advertising equation, it is significantly explain by market concentration and profitability variables. Greater profitability negatively affecting product differentiation while more concentrated market positively influencing advertising expenditure. However, an exception to the case of broad measure of foreign employment shares which positively affecting advertising expenditure while market concentration is now no longer significant.

In the foreign presence equation, almost all of the variables are not significant except for market concentration and vertical integration variables in the case of wholly foreign-owned measure of foreign presence (and only market concentration variable for the broad foreign share of employment in the industry). These results suggest the existence of one-way causality that run from market concentration to the broad measure of foreign presence, i.e. lack of simultaneity between foreign presence and concentration.

The profitability equation shows that it is positively and significantly affected by market concentration, while all extent of foreign employment shares and the capital-output ratios are significantly lowering profitability. Capital-output ratio is significant and negatively signed which is quite unexpected.

Table 6 presents the more or less similar 2SLS results of system estimations based on the foreign fixed asset shares as the proxy for foreign presence (*FPV*). All extent of foreign fixed asset shares are not significant in the concentration equation and market concentration is also not significant in explaining foreign presence. The results for the 2SLS system estimation for the FE model for both the concentration and foreign presence equations still show that no simultaneity exist between them. However, broader measurement of foreign fixed asset shares yield a positive and significant effect of market concentration.

Table 6: FE-2SLS estimations of the simultaneous equations model using *FPK*

Var.	ADVA	F100K	F50K	F10K	KL	MESV	SIZE	GROW	R^2	Adj R^2
CR4V_1	-2.02 (-0.81)	-0.37 (-0.95)			0.05[a] (3.22)	0.43[a] (8.21)	0.02 (1.01)	-0.01 (-1.42)	0.97	0.95
CR4V_2	(-1.01) (-1.01)		-0.29 (-0.65)		0.04[c] (1.78)	0.45[a] 9.35)	0.02 (0.75)	-0.01 (-1.13)	0.97	0.95
CR4V_3	-3.68 (-0.74)			0.02 (0.01)	0.05[a] (3.20)	0.45[a] (4.32)	0.003 (0.02)	-0.004 (-0.14)	0.97	0.95

Var.	CR4V	F100K	F50K	F10K	PCM	R^2	Adj R^2
ADVA_1	0.07[a] (4.33)	-0.11[b] (-2.10)			-0.07[a] (-3.73)	0.90	0.87
ADVA_2	0.07[a] (4.10)		-0.06[c] (-1.69)		-0.06[a] (-3.39)	0.90	0.87
ADVA_3	0.08[a] (4.38)				-0.05[a] (-2.22)	0.90	0.87

Var.	CR4V	ADVA	SIZE	KOVA	VI	WBC	R^2	Adj R^2
F100K	0.17 (0.83)	-0.85 (-0.30)	0.02 (1.20)	0.003 (0.26)	-0.24[c] (-1.87)	-0.01 (-0.40)	0.92	0.89
F50K	0.26 (1.15)	-0.54 (-0.17)	0.02 (1.09)	-0.01 (-1.07)	-0.24 (-1.66)	-0.01 (-0.45)	0.91	0.89
F10K	0.70[a] (2.76)	-5.57 (-1.59)	0.03 (1.30)	-0.003 (-0.24)	-0.28[c] (-1.77)	-0.06[c] (-1.75)	0.90	0.87

Var.	CR4V	F100K	F50K	F10K	GROW	KOVA	R^2	Adj R^2
PCM_1	0.35[a]	-1.57[a]			0.003[a]	-0.03[a]	0.94	0.91

	(10.74)	(-16.56)			(2.57)	(-14.07)	
PCM_2	0.45[a]		-1.16[a]		0.001	-0.05[a]	0.93	0.91
	(11.91)		(-14.26)		(0.44)	(-18.27)	
PCM_3	0.31[a]			-0.30[a]	0.00	-0.04[a]	0.91	0.87
	(6.54)			(-4.23)	(-0.53)	(-12.33)	

Note: Estimated coefficients are shown together with the value of the t-statistics in parentheses. *a, b* and *c* denote statistical significance at 1, 5 or 10 per cent levels respectively.

5. Concluding Remarks

This study considers the direct relationship between three extents of foreign presence under three different proxies and market concentration of an industry. The single equation estimation results for the 174 aggregate 5-digit manufacturing industries in Malaysia for 2001-2004 revealed that foreign presence in terms of the foreign share of fixed assets has no significant impact on increasing the level of concentration in the Malaysian manufacturing industries. However, higher foreign presence in terms of both foreign shares of value added and employment significantly contributes towards more concentrated markets. This finding offers only partial empirical support for the hypothesis that market structure is directly related to foreign ownership levels.

On the other hand, this study also considers the factors which determine the inter-industry variation in the extent of foreign ownership in Malaysian manufacturing sector and find that highly concentrated market is also one of the significant determinants for all measures for foreign presence. Subsequently, the study also implemented a simultaneous equations approach using two-stage least-squares (2SLS with fixed effects model) for investigating structure-conduct-performance and foreign presence relationships in the Malaysian manufacturing industries. There is no evidence for the existence of simultaneity effects between market concentration and foreign presence.

Appendix A

Variable Descriptions

Variables	Descriptions
Market Concentration Index -Main dependent variable (*CR4V*)	The proportion of an industry's value added accounted for by the largest 4 plants in each industry (as an absolute concentration index).
Advertising Intensity (*ADVA*)	The ratio of advertising expenditure to the value added for each industry.
Foreign Presence (*F10V, F50V, F100V*) (*F10L, F50L, F100L*) (*F10K, F50K, F100K*)	The foreign share of value added or employment or fixed assets in each industry. Three extents of foreign presence: broad foreign shareholding of 10 per cent and above, majority foreign shareholding of greater than 50 per cent, or wholly foreign shareholding of 100 per cent stakes.
Capital Intensity (*KL*)	The ratios of total assets (at book value) to the total number of employees in an industry.
Economies of Scale (*MESV*)	The ratio of the average size of the establishments which account for 50% of the total industry value added to the total value added of the industry.
Market Growth rate (*GROW*)	The per centage growth of value added of each industry in the period of 2000-2004.
Market Size (*SIZE*)	Absolute industry size measured in terms of RM'000 000 of value added of each industry.
Capital-Output ratio (*KOVA*)	The ratio of total capital (i.e. fixed assets) to total industry value added.
Minimum Capital Requirement (*MKRV*)	Multiplying minimum efficient of scale (*MES*) by capital-output ratio (*KOVA*)
Labor Quality (*WBC*)	The ratio of white-collar to blue-collar workers for each industry.
Vertical Integration (*VI*)	Value added per sales of each industry.
Price-Cost Margin (*PCM*)	Gross profits (value added minus wage) as a proportion of sales.

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