



Foreign Presence and Indonesian Food Industry Performance

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ABSTRACT

This paper analyzes the influence of foreign presence on the performance of food industry in Indonesia using panel data from 28 subsectors in the period of 2011 to 2015. The data used is the Annual Survey of Large and Medium Industries (IBS) from Statistics Indonesia. The performance indicator utilized is the price cost margin (PCM). The PCM model was estimated using regression and tested with the Hausman statistical test. The results show that foreign presence increases the performance of Indonesia's food industry. Other factors that affect the industry's performance are industry concentration, market growth and imports of raw materials. Foreign presence, concentration and market growth have a positive effect on performance, meanwhile import ratio has a negative effect. The government needs to continue to encourage foreign investment in the food industry since the presence of foreign presence will improve industrial performance. In addition, efforts are also needed to supply quality raw materials by encouraging the development of domestic upstream industries.

Keywords: Foreign Presence, Margins, Food Industry, Indonesia

JEL Classifications: L25, L66

1. INTRODUCTION

The food industry is one of the industries that interests foreign investors to invest in Indonesia. In 2010, the food industry occupied the highest position that received foreign investment with a percentage of 31%, while in 2016 this percentage decreased to 13% but still occupies the top five positions (BKPM, 2017). The presence of foreign firms is expected to have an impact on the performance of the food industry.

The impact of the presence of foreign firms on the performance of the host country industry is still being debated in some literature. Khalilzadeh-Shirazi (1974) using data from the UK manufacturing industry revealed that foreign presence had no effect on industry performance as measured by price cost margin (PCM). A foreign presence is defined by using a dummy variable of one value if the industry has an output share of foreign firms of 10% or more. Several other studies have shown a positive

influence on the presence of foreign margins. Foreign presence in the form of foreign investment is the most important variable in determining PCM (Kalirajan, 1993). Foreign presence has a positive effect on PCM in the Philippines (Go et al., 1999), in Malaysia (Kalirajan, 1993) and US (Co, 2001).

Some literature shows the positive and negative impacts of foreign existence on margins. Sembenelli and Siotis (2005) examined the presence of foreigners measured by output produced by firms with foreign ownership. His research only looks at the effect on foreign ownership expressed in dummy variables. The results concluded that foreign investment in the form of foreign presence has a positive influence on PCM in the long run. This only happens in sectors that are intensive in research and development (R&D). In the non-intensive research and development sector, foreign presence and ownership reduce margins in the short term, but this effect diminishes over time and in the long run there is no effect on margins. Maioli et al. (2005) also showed that the presence of

foreign greenfield firms had the effect of reducing margins, while the presence of non-greenfield foreign firms increased price-cost margins.

The impact of foreign presence on the margin depends on the presence or absence of leaving firms. If there are no firms leaving and demand is stable (fixed), new foreign firms can reduce margins since they can increase domestic capacity and production, resulting in prices and margins to fall. Meanwhile, margins can increase if foreign firms enter using the latest technology, which causes an increase in industry margins. The advantage of using advanced technology by foreign firms can cause spillover on domestic firms resulting in increased margins (Co, 2001).

This paper aims to analyze the impact of foreign presence on the PCM of the Indonesian food industry. Research using cases in Indonesia has never been done before. Information about the relationship between foreign presence and PCM can be an input for policy makers related to foreign investment, especially in the Indonesian food industry. This study has limitations since there is no data related to product differentiation and expenditure for research and development.

2. METHOD

The data utilized to analyze the impact of foreign presence on the performance of the food industry in Indonesia is panel data for 2011-2015. This data is an annual survey of Large and Medium Industries (IBS) conducted by Statistics Indonesia. Data after 2015 was not available at the time of the study.

IBS data are plant level data, but the model is estimated at the food industry subsectors. To determine the presence of foreign firms, industry performance and industry-level characteristics, the plant level data is aggregated into specific industry groups at the 5-digit level. The data includes 75 subsectors, but subsectors that have data of <10 plants are combined at the 4 digit level therefore this study uses 28 subsectors.

Industry performance is measured by PCM. The use of PCM has been widely used in previous studies (such as Khalilzadeh-Shirazi, 1974; Domowitz et al., 1986; Prince and Thurik, 1992; Setiawan et al., 2012). PCM shows the ability of firms in an industry to increase prices above production costs. PCM was calculated using the formula proposed by Domowitz et al. (1986), Prince and Thurik (1992) and Setiawan et al. (2012) namely:

$$PCM = \frac{\text{Value added} - \text{Labor costs} + \Delta \text{Inventories}}{\text{Sales} + \Delta \text{Inventory}} \quad (1)$$

The PCM model is explained by the presence of foreign firms in each subsectors (as a dependent variable) and some relevant industry characteristics. The PCM equation used is as follows:

$$PCM_{it} = \alpha + \beta_1 F_{it} + \beta_2 CR4_{it} + \beta_3 GRO_{it} + \beta_4 CAP_{it} + \beta_5 EXP_{it} + \beta_6 IMP_{it} + \varepsilon_{it} \quad (2)$$

Where:

PCM = Price cost margin

F = Foreign presence

CR4 = Ratio of industrial concentration

GRO = Market growth

CAP = Capital intensity

EXP = Export per output ratio

IMP = Ratio of imports per output.

Foreign presence is calculated from the share of foreign firm sales divided by total sales in industry (Ghemawat and Kennedy, 1999; Driffield, 2001a; Singh, 2011). Sales are deflated using the consumer price index of food and beverage products (base year 2000) to eliminate the effects of inflation. This study defines a foreign firm as a firm that has a positive foreign ownership value (>0). The resulting sign will be the answer to the research problem.

Industrial concentration in this study was calculated using a concentration ratio (CR4). CR4 is the total sales share of the four largest firms in the industry subsector. CR4 is often used to classify markets into several categories. Khalilzadeh-Shirazi (1974) showed no significant effect of concentration on PCM. Other studies show different results. Kalirajan (1993), Go et al. (1999), Co (2001), Setiawan et al. (2012) and Setiawan et al. (2013) show that industrial concentration has a positive influence on PCMs. The presence of several firms in a concentrated industry will have market power to influence the price and quantity of goods so that the concentration of the industry will increase the PCM (Setiawan et al., 2012). Based on some of the literature, the expected effect on this variable is positive.

Market growth is the percentage of sales growth of each subsector (Bourlakis, 1987; Backer and Sleuwaegen, 2003; Singh, 2011; Forte and Sarmiento, 2014). Market growth can affect PCM positively through increased in sales in the market. Empirical studies have proven the hypothesis that demand growth in industry (which is calculated by increasing sales between 2 years) has a positive effect (Esposito and Esposito, 1971). A different opinion was expressed by Caves (1971) industry that has oligopoly characteristics, rapid demand growth causes the price behavior of firms to become less competitive.

The difference in capital intensity between industry subsector is reflected by the capital-output ratio. Prince and Thurik (1992) state the reason for using capital intensity in the PCM equation. Capital used in the industry subsectors can be seen as a barrier to entry. The higher capital intensity in a subsector shows more difficult for new firms to enter. Market power will be greater if no competitors enter. This variable was also used by Martin (1979), Domowitz et al. (1986), Stalhammar (1991) Prince and Thurik (1992) and Go et al. (1999).

This study defines the ratio of imports as ratio of imported raw materials to output produced in industry subsectors. This is different from Go et al. (1999) using the import ratio variable as import competition in an industry. Imports are expected to have a negative influence on PCM. This variable is also used by Prince and Thurik (1992).

The effect of exports on PCM is still being debated, there is empirical evidence that shows both positive and negative influences. There are two reasons underlying the negative effect of exports on PCM proposed by Neumann (1983) and Pugel (1980). First, firms export by lowering prices in order to compete. Second, foreign markets can be used as alternative markets if foreign demand is more elastic than domestic demand. So firms that export by lowering prices will get an increase in total revenue.

While the reason for the positive influence of exports on PCM was stated by Khalilzadeh-Shirazi (1974) and Pagulatos and Sorensen (1976). First, exports carry risks for firms that mainly due to foreign market uncertainty. The risk is a part of the price therefore increasing risk cause margins to increase. Second, if the foreign market is less elastic compared to the domestic, the firm will increase prices in order to increase its revenue so that margins become higher. A summary of the variables used can be seen in Table 1.

3. RESULTS AND DISCUSSION

Statistical description of the variables used in this study can be seen in Table 2. This table shows that the data used are relatively heterogeneous. The standard deviations between industry subsectors are quite high on all variables. The average PCM shows 0.296 meaning that the average margin (difference in price and cost) at food firms in Indonesia is 29.6%.

Table 1: Independent variables and their proxies

Variables	Proxies	Expected sign
Foreign presence (F)	Sales of foreign firms are divided by total sales in the industry subsector	Positive/Negative
Industrial concentration (CR4)	Sum of sales of the four largest firms in the industry subsector	Positive
Market growth (GRO)	The growth rate of sales in the food industry group	Positive
Capital intensity (CAP)	The ratio of capital to output	Positive
Export ratio (EXP)	The ratio of exports to output	Positive/Negative
Import ratio (IMP)	The ratio of imports to output	Negative

Table 2: Description of statistics variable 2011-2015

Variable	Maximum	Minimum	Average	Standard deviation
Price cost margin (PCM)	0.774	0.108	0.296	0.100
Foreign presence (F)	0.857	0.000	0.149	0.184
Industrial concentration (CR4)	0.962	0.119	0.649	0.221
Market growth (GRO)	1.953	-0.759	0.167	0.388
Capital intensity (CAP)	27.702	0.044	1.085	2.884
Export ratio (EXP)	130.931	0	35.095	41.616
Import ratio (IMP)	0.685	0	0.068	0.129
N-observation	140	140	140	140

Source: IBS 2011-2015 data (author's calculation)

The average value of PCM in the period 2011-2015 shows that the industrial subsector that have high margins are the sugar (ISIC 10720), salted, dried, smoked fish (ISIC 10211), frozen fish (ISIC 10213), processing and preserving meat (ISIC 10100), cocoa, chocolate, dried fruit and vegetable (ISIC 10730) and food seasoning (ISIC 10772). Whereas industries that have low margins are found in rice and corn milling (ISIC 10630) and preserved fish (ISIC 10214).

Based on foreign presence, industry subsectors that have the highest percentage are canned fish, shrimp and other aquatic biota (ISIC 10221), cocoa, chocolate, dried fruit and vegetable (ISIC 10730), other processing and preserving aquatic biota (ISIC 10290) and frozen fish (ISIC 10213). There are seven industry subsectors that are not owned by foreigners, Salted, pulverized, dried, frozen fruit and vegetable (ISIC 10310), tempeh, tofu and soybean, fruit and vegetable processing (ISIC 10390), rice and corn milling (ISIC 10630), macaroni and noodles (ISIC 10740), processed food (ISIC 10750), cakes (ISIC 10792), other food from soybean, not fermented soybean, tempeh, and tofu (ISIC 10793).

Industry subsectors that have the highest concentrations include food seasoning (ISIC 10772), other processing and preserving fish (ISIC 10219), processed food (ISIC 10750), macaroni and noodles (ISIC 10740). While those with low concentrations include rice and corn milling (ISIC 10630), crude palm oil (ISIC 10431), crackers (ISIC 10794), tempeh, tofu and soybean, fruit and vegetable processing (ISIC 10390).

The highest market growth occurred in soy sauce (ISIC 10771), salted, dried, smoked fish (ISIC 10211), processed coffee and tea (ISIC 10761) and food seasoning (ISIC 10772). Industry subsectors that on average had negative growth throughout 2011-2015 were cocoa, chocolate, dried fruit and vegetable (ISIC 10730), canned fish, shrimp and other aquatic biota (ISIC 10221) and processing salt (ISIC 10774).

The highest average capital/output ratio is in other processing and preserving fish (ISIC 10219), salted, dried, smoked fish (ISIC 10211), preserved fish (ISIC 10214), copra, coconut oil and other coconut processing (ISIC 10420) and processed product from milk and ice cream (ISIC 10500). While the lowest were found in animal feed and concentrate (ISIC 10800), processing and preserving meat (ISIC 10100), crude palm oil (ISIC 10431), Other processing and preserving aquatic biota (ISIC 10290).

Large export ratios include other processing and preserving aquatic biota (ISIC 10290), Canned fish, shrimp and other aquatic biota (ISIC 10221), Frozen fish (ISIC 10213), salting, drying and smoking of fish (ISIC 10211) Whereas the zero export ratio (not exporting) is soy sauce (ISIC 10771), sugar (ISIC 10720) and Tempeh, tofu and soybean, fruit and vegetable processing (ISIC 10390). Industry subsectors that have a large import ratio include animal feed and concentrate (ISIC 10800), processing salt (ISIC 10774), Processed product from milk and ice cream (ISIC 10500) and tempeh, tofu and soybean, fruit and vegetable processing (ISIC 10390), Other food from soybean, not fermented soybean, tempeh, and tofu (ISIC 10793) and sugar (ISIC 10720).

Table 3: Estimation results of determinant of PCM

Independent variable	Coefficient	P-value
Foreign presence (F)	0.115**	0.015
Industrial concentration (CR4)	0.080*	0.073
Market growth (GRO)	0.030*	0.084
Capital intensity (CAP)	0.001	0.789
Export ratio (EXP)	0.000	0.974
Import ratio (IMP)	-0.175***	0.000
Constant	0.233***	0.000
R ²	0.215	
No of observation	140	

***, ** and * indicate the significance level of 1%, 5% and 10%

The results of the regression analysis can be seen in Table 3. The Hausman statistical test shows that the use of the random effect model is more suitable than the fix effect model. The random effect model also produces R² greater than the fix effect, therefore only the random effect model will be discussed.

Based on Table 3 it can be seen that foreign presence in the Indonesian food industry has a positive influence on PCM. Significant positive signs on the estimated coefficient show that industries that have a high share of foreign sales will have a high PCM value as well. This can occur due to foreign presence, especially in industrial subsectors that require technology such as canned fish, shrimp and other aquatic biota; cocoa, chocolate, dried fruit and vegetable. Increased margins occur since foreign factories in the industry group use technology that causes increasing productivity and decreasing production costs.

Increased foreign presence of PCM can also occur since foreign firms are able to produce high quality and differentiated food products. Quality and differentiated products increased in accordance with the wishes of consumers. Demand for these products becomes less elastic and consumers do not easily shift to other products. Products produced by foreign firms are difficult to substitute with other products (irreplaceable) therefore consumers are willing to pay for these products at higher prices. This causes the value of PCM to be higher.

The influence of this positive foreign presence supports the opinion expressed by Go et al. (1999) who examined the manufacturing industry in the Philippines. Foreign investment entering a country occurs if multinational firms have some assets that are not available in the host country. These assets can be highly developed resources related to market forces and technology, marketing and organizational structures that are more advanced in the country of origin and can be easily applied in the country of investment destination (Go et al., 1999).

Estimation results indicate that industrial concentration has a positive effect on PCM. The Indonesian food industry has an industry concentration that is categorized as oligopoly (Setiawan et al., 2012). The oligopoly structure causes the possibility of collusion causing the margins become larger. These results support the opinion expressed by Setiawan et al. (2012), Setiawan et al. (2013), Delorme et al. (2002), Go et al. (1999), and Khalilzadeh-Shirazi (1974).

Market growth has a positive and significant impact on PCM. Market growth in the Indonesian food industry has increased

mainly related to the number of Indonesian population who have the purchasing power of processed food products. The number of people who have increased purchasing power causes the demand for food products to increase. Firms were facing very high demand growth and no competitive pressure in industries. This causes the possibility of increasing demand in the short term which leads to higher prices and margins. These results are consistent with Khalilzadeh-Shirazi (1974) that market growth can have a positive effect on PCM.

Capital intensity did not show significant results. This shows that the large ratio of capital to output does not affect the performance of the food industry. The export ratio variable also shows that the export of the food industry in Indonesia does not affect PCM. Processed food products exported by Indonesia are specific products and the demand is large in the foreign markets therefore when exporting, there is no need to make price changes that affect the margins received.

Regression results indicate a negative effect on imports of raw materials on PCM. The more imports of raw materials, PCM will decrease. The Indonesian food industry still needs imported raw materials, especially in animal feed, salt, milk and ice cream processing, tempe, tofu and other soybean preparations and sugar industry. Importing raw materials in the industry is conducted since food factories cannot meet the needs of raw materials from domestic production related to quantity or quality. Purchasing raw materials from abroad by importing can cause the production costs of the food industry to increase. The increase in costs will decrease in margins.

4. CONCLUSIONS AND POLICY RECOMMENDATIONS

This study examines the influence of foreign presence on the performance of the food industry group by using annual Big and Medium Industry (IBS) survey data from the Statistics Indonesia. The performance of the food industry subsectors is measured by PCM. This study uses panel data with 28 subsectors in the 2011-2015 period. The results show that foreign presence increases the performance of Indonesia's food industry. Other factors that affect performance are industry concentration, market growth and imports of raw materials. Foreign presence, concentration and market growth have a positive effect on performance, but the import ratio has a negative effect.

Based on these results, the government needs to encourage foreign investment in the food industry because foreign presence will improve industrial performance. In addition, efforts are also needed to supply quality raw materials by encouraging the development of domestic industries that can supply salt, sugar, milk, soybean products that are still imported. Provision of raw materials will reduce imports of raw materials and improve industrial performance.

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