Malaysian Halal Export Market: Case Study on Developing Countries

Azral Izwan Mazlan
Faculty of Economics and Management
Universiti Putra Malaysia
E-mail: azral.izwan@gmail.com

Hanny Zurina Hamzah[1]
Department of Economics
Faculty of Economics and Management
Universiti Putra Malaysia
E-mail: hannyzurina@upm.gov.my

ABSTRACT

A standard is believed to be one of the factors that will boost international trade. Malaysia is known as a Muslim country worldwide which among the earliest initiated the Halal certification standard. Consequently, the Halal industry evolved and apparently giving Malaysia a comparative advantage in gaining global market share. However the statistics has shown that after three years, the Halal products export growth rate is declining significantly particularly in developing countries. This study aims to identify the determinants of Malaysian Halal export. The findings might be helpful to local Halal industry players to boost their Halal product export. This study employed fixed-effects model of panel data for 44 developing countries for Halal export from 2010 to 2013, GDP of the importer country is proven to be significant factor in enhancing export of Malaysian Halal products

Keywords: Halal Standards, International Trade, Fixed-Effects Model, Developing Countries

ABSTRAK

Standard merupakan salah satu faktor dalam mempengaruhi peningkatan dagangan antarabangsa. Malaysia merupakan negara yang dikenali seluruh dunia sebagai negara Muslim adalah pelopor standard pensijilan Halal. Kesannya, industri Halal ini terus berkembang pesat dan memberikan Malaysia kelebihan berbanding dalam mengukuhkan syer pasaran global. Walau bagaimana pun, statistik menunjukkan kadar pertumbuhan eksport produk halal mengalami penurunan secara mendadak selepas tiga tahun kebelakangan ini terutama di negara-negara membangun. Oleh itu, kajian ini dijalankan untuk mengenalpasti faktor penentu dalam eksport produk Halal Malaysia. Penemuan kajian ini berkemungkinan boleh membantu firma tempatan yang terlibat dalam industri Halal untuk meningkatkan nilai eksport produk Halal mereka. Data daripada tahun 2010-2013 bagi 44 negara –negara membangun dikumpulkan dan diuji menggunakan kaedah pengujian signifikan kesan-tetap. Hasil analisa menunjukkan, terdapat hubungan kausal yang signifikan di antara nilai eksport produk Halal Malaysia dengan KDNK pengimport.

Kata kunci: Standard Halal, Perdagangan Antarabangsa, Model Kesan-Tetap, Negara Membangun

INTRODUCTION

In the era of globalization, finding a new market with a niche product and service is considered challenging for the world market players. Halal branding is one of the many requirements by industry players that would like to make a significant impact on global market. As a basic necessity, Halal food has a strong inelastic demand to consumers from Muslim countries. Halal is a term used to clearly identify either the products livestock, processed food or other consumption product is allowable to be consumed by any Muslim. Previously any given product is assumed Halal based on trust without proper investigation or certification. The concept of Halal is used in many applications such as

---

[1]Corresponding author. Contact number: +603-89467766.

pharmaceutical, cosmetics, food manufacturing, and many more industries. However, the emergence of other food safety standards such as Hazard Analysis Critical Control Point (HACCP), Good Management Practice (GMP) and International Standardization Organization (ISO) has leaded the path for the creation of Halal food standard.

Halal standard is usually confined within a country. Consequently the responsibility of any products to be declared as Halal is the prerogative the government or any organisation which is authorised by the government. It might be different in terms of shariah application due to various Muslims scholars (Ab. Halim & Mohd Salleh, 2012). In ASEAN region itself, country such as Malaysia, Thailand, Indonesia, Singapore and Philippines has their own institution which in charge of Halal certification.

Halal industry has a promising market all over the world, however less discussion being held on the real impact on value of export for product which registered as Halal product. According to Borzooei and Asgari (2013), strong Halal brand are proven to assist corporations to penetrate into new market. Nevertheless, Halal standard is not the only factor that will increase the value of export.

In Malaysia, Halal certification started way back in 1974 (Department of Islamic Development of Malaysia [JAKIM], 2011). During the period, the duty of certification of Halal product is under jurisdiction of Research Center of the Islamic Affairs Division of the Prime Minister's Office. A company with Halal certified product was given a letter from above-mentioned division and only in 1994, issuance of Halal certificate and Halal logo was practised. MS 1500:2004 (Malaysian Standard: Halal Food Production, Preparation and Storage General Guidelines) was introduced in 2004. It was revised in 2009 with the addition of GMP and Good Hygiene Practices (GHP).

JAKIM is responsible in certifying Halal standard as well as issuing Halal certificate to four types of products and services i.e. food and beverages products, consumer goods, food premises and slaughter house. Those industries and premises which granted with Halal certification are allowed to carry the logo on their products and to display the Halal certificate in their premises. In 1998, the task to certify Halal product was given to Ilham Daya, a company which was appointed by the government. However, in 2002, the task was reverted to JAKIM under Food and Islamic Consumer Products Division. Again in 2008, the task was outsourced to Halal Industry Development Corporation but in 2009, government has decided that Halal certification is the task that solely to be responsible by government agency, JAKIM (Noordin, Noor, Hashim, & Samicho, 2009).

Halal standards were being developed by Malaysia Standards Department. To date there are eight Malaysian Standards (MS) which provide practical guidance for the food industry on the preparation and handling of Halal food, Halal cosmetics and personal care products and Halal pharmaceutical products as a basic requirement for Halal product and trade or business in Malaysia (HDC Global, 2013).

According to Ab. Halim and Mohd Salleh (2012), due to increasing demand of Halal product particularly from the Organisation of Islamic Countries (OIC) member states, there is a need to have uniformity and consensus among country members in terms of Halal certification. This issue lead to the idea of harmonization of Halal standard which is mutually accepted by all country members. Eventually, this initiative will reduce non-tariff trade barrier among intra-OIC member states (COMCEC, 2014). The Standing Committee for Economic and Commercial Cooperation of the Organization of Islamic Cooperation (COMCEC) is the committee that responsible for the establishment of the OIC-Standardization Experts Group on Halal Food. Previously the committee has presented three guidelines on Halal practice in the 25th Meeting of COMCEC which later been adopted but yet to be approved by all OIC member states (Ab. Halim & Mohd Salleh, 2012).

In 2009, the total of Halal food market was dominated by Asian countries with USD400 billion or 63% share and of this, Indonesia alone accounts for 19%, followed by GCC countries (11%), India (6%), and China (5%) (Bon & Hussain, 2010).The GCC countries import more than 90% of their total food consumption and thus constitute an important market, while India and China, with Muslim population estimated at 161 million and 22 million respectively, are two important non-GCC member Halal food markets in this region.

Apart from the above Muslim prospect countries, surprisingly, the European region, with more than 38 million Muslims represented 10% or USD67 billion of the total Halal market in 2009. This is due to their high purchasing power of European Muslims and the growing number of educated Muslims in the labour market (Bon & Hussain, 2010). According to Halal Industry Development Corporation (2012), an estimated of USD3 billion importation of Halal food has been recorded by non-Muslim Dutch consumer annually and port of Rotterdam in Netherlands has a dedicated Halal storage facility.

Table 1 shows the top ten importers of Malaysian Halal food. China has become the top country in the year of 2010 until 2013 with total volume of nearly RM14 billion. However it is worth to take note that only four out of top ten countries importer are developing countries.

Halal export is only being captured by HDC starting from 2010. Previously the Halal products were exported but not the main focus of the government. Halal export has increased by 34% in 2012 compared to 2011 and 56.9% increased from 2010 to 2011. Eventually, Halal products export in 2013 accounted for RM32.8 billion, an increase of only 2.7% compared to 2012 (Halal Development Corporation [HDC] Malaysia, 2014). This huge difference of export volume increase triggers of doubt if the Halal certification is required in order to increase export. In another point of view, Halal certification is only needed to convince the consumer that the product is really Halal or it just a requirement by government in order to penetrate market in Malaysia and other Muslim countries by using Halal as a type of branding strategy. The details of Halal export values by categories of products are shown in Table 2.

This study aims to identify the determinants of Halal export. As Malaysia has comparative advantage in Halal industry, Halal export is expected to increase as the gross domestic product (GDP), final consumption percentage over GDP and population size of the importer countries increase. This study is expected to bring some highlights on Malaysian Halal products export market. Eventually, the findings are able to assist policy-makers to make an informed-decision with regards to Halal development in Malaysia.

LITERATURE REVIEW

The scarcity of resources and raising world population has alarming our concern in food security. Estimated world population size currently accounted for 7.17 billion in 2014[2](United States Census Bureau, 2014). Due to depleting resources, it is essential for human to be very selective in food consumption. Considering the supply and demand of livestock and processed food that are in open market, any countries with comparative advantage will promote international trade to other countries. However, there is an issue on how to ensure that exporter countries has fully compliant to certain safety and healthy procedures. This led to introduction and adoption of HACCP standard by National Advisory Committee on Microbiological Criteria for Foods in the United States in 1992 (Caswell & Hooker, 1996).

The branding of Halal is demonstrated to be an assistance to penetrate into new market (Borzooei & Asgari, 2013). However, having Halal standard alone is not necessarily increase volume of trade. Other factors with regards to export to be considered are non-tariff trade barriers, marketing strategy as well as Muslim populations of the importer country. A study case in Singapore has shown that McDonald's outlets have registered increase in sales significantly with introduction of Halal menu (Kyung-Hoon, 2013; Borzooei & Asgari, 2013).

Jaffee and Henson (2004) highlighted the potential opportunities arising from the development in standards that may use the new standards to increase their market share in trade. Thus Halal standard is expected to increase export of Halal products given the comparative advantage of Malaysia in the Halal industry. Anders and Caswell (2009) in their study on HACCP implementation has shown that GDP variable has a positive effects on volume of seafoods import. However, HACCP implementation has a negative effects towards the US volume of seafoods import from developing and developed countries.

In discussing the impact of standards towards international trade, econometric method is mostly used by researchers (Anders & Caswell, 2009). In details, gravity equation approach is being used in analysing standards impact on international trade. Previous studies on international trade by Filippinia and Molini, (2003) and Baltagi, Egger, and Pfaffermayrb, (2003) employed gravity equation approach to analyse the interaction effects. One of the advantages of using this approach is the ability to disentangle the time invariant country-specific effects through a panel approach (Egger, 2000). However, the panel nature is that the data may introduce heterogeneity biases requiring appropriate econometrics methods to overcome this issue (Anders & Caswell, 2009).

Anders and Caswell (2009) indicated various studies on trade flow analysis with geographical distance as one of variables used random-effects estimators rathen than fixed-effects estimator. This is due to fixed-effects estimators will eliminate all time-invariant variation effects. However, the author noted that other studies by Otsuki, Wilson, and Sewadeh (2001) and Blind and Jungmittag (2005) which applied fixed-effects models eventhough with time-invariant variables in the models. For the

---

[2] Estimation by the United States Census Bureau based on latest birth and mortality rate.

purpose of this study, fixed-effects model is choosen in absence of the geographical distance as the independent variable.

METHODOLOGY

The static panel data model is as follows:

$$Y_{it} = \alpha_{it} + \beta_i Z_{it} + V_{it} + \varepsilon_{it}$$ [1]

Y is the dependent variable with i means cross section and t means time. Z represents vector of independent variable and V_{it} will capture country specific and ε_{it} is whitenoues error term. For purpose of this study, the model is adopted from various literature mainly in discussing impact of food safety standards on trade (e.g. Nugroho, 2014; Wei, Huang, & Yang, 2012; Anders & Caswell, 2009; Otsuki, Wilson, & Sewadeh, 2001). Most studies employed amended gravity equation to analyse the impact of food safety standard on trade.

This study used a variant of the classic gravity equation to analyse the effect of three independent variables namely, importer GDP, importer percentage of final consumption over GDP and size of the importer country (proxy by population size) on Malaysia's Halal trade export. Due to limitation of data, significant variable in gravity equation such as distance between Malaysia and importer countries is absence.

The amended gravity equation approach for this study is as follows:

$$Ex\_Hal_{it} = \alpha_{it} + \beta_1 GDP_{it} + \beta_2 FC\_GDP_{it} + \beta_3 Pop_{it} + V_{it} + \varepsilon_{it}$$ [2]

Table 3 presents types and definitions of variables which being used in this study. A set of data collected from HDC for Malaysia's Halal export for period of 2010 until 2013. There are 206 countries data available. The sample was reduced to 144 countries considering active exporter since 2010. Data for all independent variables were taken from WDI. However not all 144 countries have the same set of data. Thus, only 93 countries were chosen with 44 developing countries and 49 developed countries. For purpose of this study, only developing countries are considered. However it is worth to take note that only four out of top ten countries importer are developing countries as shown in Table 1.

The export of Halal Malaysia is representing the total export of Halal products which are Malaysian products by Halal certified companies. These data is provided by HDC. While all independent variables, GDP, final consumption over GDP in percentage, and populations, are based on importer data at the given year respectively. These data are provided by the World Development Indicators, World Bank. Summary of variables, expected signs and sources of data are shown in Table 4.

Based on Table 4, Malaysia Halal export is expected to increase as demand factors such as the GDP, final consumption percentage over GDP and population size of the importer countries increase. GDP per capita of importer is expected to explain the potential demand of any country. (Linnemann, 1966). Another literature in food safety standards and trade also employ GDP per capita of importer as independent variable in their study (e.g. Nugroho, 2014; Elshehawy, Shen, & Ahmed, 2014; Wei et al., 2012; Anders & Caswell, 2009; Otsuki et al., 2001). A higher amount of GDP could be translated into higher import (Elshehawy et al., 2014).

In gravity model, size of population explains the potential demand of product (Linnemann, 1966). Population size of the importer could be translated that higher population will potentially increase the demand for the export product. Another variable which is the percentage of final consumption over GDP could also explain that the greater percentage the higher demand for export.

RESULTS AND FINDINGS

Based on the regression conducted the descriptive statistics is presented in Table 5. There are 176 observations that have been made from 44 developing countries from 2010 to 2013.

Random-effects model or fixed-effects model were both employed to overcome the issue of panel data which it may introduce heterogeneity biases and requiring appropriate econometrics. By using only pooled OLS result, the study may deny the heterogeneity or individuality that may exist among the 44 countries. This study employed Breusch-Pagan Lagrange Multiplier test to find

appropriate model either pooled OLS model or random-effects model. The hypothesis for Breusch-Pagan LM test is as follows:

H_0 : *Pooled OLS model is appropriate.*
H_α :*Random-effects model is appropriate.*

In Breusch-Pagan LM test, we reject null hypothesis if the *p*-value is significant. Based on the result as shown in Table 6, the Breusch-Pagan LM test is significant at 1%, thus we reject null hypothesis and random-effects model is appropriate for this study.Next, this study employed Hausman test to choose appropriate model either fixed-effects model or random-effects model.

H_0 : *Random-effects model is appropriate.*
H_α :*Fixed-effects model is appropriate.*

In Hausman test, we reject null hypothesis if the *p*-value is significant. Based on the result as shown in Table 6, the Hausman test is significant at 1 percent, thus we reject null hypothesis and fixed-effects model is appropriate for this study.

Summary of results by all models are as in Table 7. Results shown that the probability fixed-effects model is significant at 1% and we can assume that the model is nicely fitted with all coefficients are not equal to zero. Two independent variables have shown positive relationships with dependent variable and in according with the expected sign shown in Table 4 earlier. GDP is significant with probability value at 1% while population size of importer significant with probability value at 5%.

Subsequently, a diagnostic check was conducted to ensure the model is free from heterocedasticity and serial correlation problems. The hypothesis for diagnostic check for heterocedasticity and serial correlation are as follows respectively:

H_0 : *Homoscedastic | No serial correlation exist*
H_α :*Heteroscedastic | Serial correlation exist*

In above-mentioned tests, we reject null hypothesis if the *p*-value is significant. Based on the result as shown in Table 8, we can conclude that this model has both heterocedasticity and serial correlation problems. In order to solve these problems, robustness diagnostic test check is conducted. Table 9 presents the summary results of fixed-effects models prior and after robustness check was undertaken. GDP and population size shows positive relationship with Halal export as per expected signs. However, final consumptions is showing negative relationship which is against the expected sign.

Based on the results, GDP of importer countries is positively significant at 5% towards volume of Malaysia's Halal products exports. Results shown that, an increase of 3.54% of importer GDP will increase 1% of Malaysia's Halal export to developing countries, *ceteris paribus*. The other variables have shown insignificant results even though population size shows positive relationship as expected. Anders and Caswell (2009) in the study on HACCP implementation has also suggested that importer GDP has a positive effects on volume of seafoods import. However, HACCP implementation has a negative effects towards the US volume of seafoods import from developing and developed countries.

SUMMARY AND CONCLUSION

Halal products exports may emerge as one of the main sources of national income. Given the full support by the government, the Halal industry players should take extra initiatives to boost export volume especially by focusing to size of GDP in developing countries. This study aims to identify among other factors that could enhance the Halal export. According to trade theory, export is expected to increase as the importers' GDP, final consumption percentage over GDP and population size of the importer countries increase.

Panel data model is built to consider time-variant and time-invariant variables. However, important variable such as geographical distance which is significant in international trade theory is dropped due to data availability. Test conducted shown the Pooled OLS model is outperformed by random-effects model. However the Hausman test had shown that fixed-effects model is more appropriate than random-effects model. Two independent variables had shown positive signs as expected in fixed-effect models. However this model has heterocedasticity and serial correlation

problems. Thus, robustness check was performed and identified that only GDP of importer is significant for Halal export.

Apart from GDP of importer, there might be other factors to be considered as Halal export enhancer. Other qualitative factors such as uniformity of Halal certification bodies, frequency of Halal application approval meetings, and complexity of Halal application process should be considered as well. It is worth steps to be undertaken in considering mixed method approach for future study in this field.

There is a growing body of literature that recognises the importance of Halal industry particularly for Malaysia. In the history of international economics, size of bilateral trade has been thought of as a key factor in contributing to the development of economic status of a country. However, previous studies have not treated Halal products export of Malaysia in much detail. Most studies in the field of Halal industry have only focused on theoretical of Halal concepts, acceptance of Halal products, awareness, Halal science-based research and only a few literatures in Halal economy. Thus, it is hoped that the evidence from this study would contribute to this growing area of research by exploring Halal economy particularly in Halal export.

Further study should be done to analyse developed countries in the model as well as other dependent variables such as geographical distance and dummy variables such as regional pact or trade policy which was proven as among significant factor in illustrating the trend in international trade. A detailed comparison between two groups of economic status could be much helpful in deciding our future steer in Halal formulation policy and strategies by stakeholders. Eventually, the right decision will be translated into significant increment of Halal products export in future.

Looking into policy implications particularly in Halal industry, this study suggests that Halal product to be continuously tapped as an industry that will further boost our export. Given the world concern on food safety and quality, government should look into the possibility of overcoming this concern by promoting Halal standards among food producers as a private food standard. Consequently, the products could be more competitive at the global market, thus will generate more income to the firms and increase volume of our export to the rest of the world.

REFERENCES

Ab. Halim, M., & Mohd Salleh, M. (2012). The Possibility of Uniformity on Halal Standards in Organization of Islamic Countries (OIC) Country. *World Applied Sciences Journal*, 6-10.

Anders, S. M., & Caswell, J. A. (2009). Standards as barriers versus standars as catalysts: Assesing the impact of HACCP implementation on US seafood imports. *American Journal Agricultural Economics*, 310-321.

Baltagi, B. H., Egger, P., & Pfaffermayrb, M. (2003). A generalized design for bilateral trade flow models. *Economics Letters, 80*, 392-397.

Blind, G., & Jungmittag, A. (2005). Trade and the Impact of Innovations and Stadards: The Case of Germany and the UK. *Applied Economics, 37*, 1385-98.

Bon, M., & Hussain, M. (2010). Halal Food and Tourism, Prospects and Challenges. *Tourism in the Muslim World Bridging Tourism Theory and Practice* (Vol. 2, pp. 47-59). Emerald Group Publishing Limited. doi:10.1108/S2042-1443(2010)0000002007

Borzooei, M., & Asgari, M. (2013). Establishing a Global Halal Hub: In-Depth Interviews. *International Journal of Academic Research in Business and Social Sciences*, *3*(10), 169-181.

Caswell, J. A., & Hooker, N. H. (1996). HACCP as an International Trade Standard. *American Journal Agricultural Economics*(78), 775-779. Retrieved 21 May, 2014

Committee for Economic and Commercial Cooperation of the Organization of the Islamic Cooperation [COMCEC]. (2014). *Statute for Standards and Metrology Institute for Islamic Countries (SMIIC).* Retrieved 2014, from COMCEC: http://www.comcec.org/EN_YE/Yeni_Site_Dokumanlar/Agreements/SMIIC.pdf

Department of Islamic Development of Malaysia [JAKIM]. (2011). *Halal History*. Retrieved 12 June, 2014, from Halal Malaysia: http://www.halal.gov.my/v3/index.php/en/corporate/halal-history

Egger, P. (2000). A note on the proper econometric specification of the gravity equation. Elsevier Science S.A. Retrieved 13 June , 2014

Elshehawy, M. , Shen, H. and Ahmed, R. (2014) The Factors Affecting Egypt's Exports: Evidence from the Gravity Model Analysis. *Open Journal of Social Sciences*, 2, 138-148. doi: 10.4236/jss.2014.211020.

Filippinia, C., & Molini, V. (2003). The determinants of East Asian trade flows: a gravity equation approach. *Journal of Asian Economics, 14*(5), 695-711. doi:10.1016/j.asieco.2003.10.001

Guoxue Wei, Jikun Huang, & Jun Yang. (2012). The impacts of food safety standards on China's tea exports. *China Economic Review*, *23*(2), 253–264. http://doi.org/10.1016/j.chieco.2011.11.002

Halal Development Corporation [HDC] Malaysia. (2014). *Malaysia's Halal Export Report*. Retrieved from Global Halal Support Center: http://www.ghsc.com.my/publisher/mas_halal_export_report

HDC Global. (2013). *Malaysia Standards*. Retrieved 11 June, 2014, from Halal Industry Development Corporation: http://www.hdcglobal.com/publisher/gw_halal_standards

Jaffee, S., & Henson, S. (2004). Standards and Agro-Food Exports from Developing Countries: Rebalancing the Debate. *Policy Reaserach Working Paper, 3348*.

Kyung-Hoon, K. (2013). The Potential of ASEAN revisited. SERI Quarterly, pp. 61-68. Retrieved 10 June, 2014, from www.seriquarterly.com

Masron, T. A., Azman, N. H. N., & Hassan, S. H. (2014). Halal Development and Food Exports: Evidence from Malaysia and the Middle Eastern Asian Countrres. *Jurnal Ekonomi Malaysia*, *48*, 2.

Noordin, N., Noor, N. L. M., Hashim, M., & Samicho, Z. (2009). Value chain of Halal certification system: A case of the Malaysia Halal industry. *European and Mediterranean Conference on Information Systems*. Retrieved from http://alhudacibe.com/truebanking/img/reports/Report-3.pdf

Nugroho, A. (2014). The Impact of Food Safety Standard on Indonesia's Coffee Exports. *Procedia Environmental Sciences*, *20*, 425-433.

Otsuki, T., Wilson, J., & Sewadeh, M. (2001). Saving Two in a Billion: Quantifying the Trade Effect of European Food Safety Standard on African Exports. *Food Policy, 26*, 495-514.

United States Census Bureau. (10 June, 2014). *U.S. and World Population Clock*. Retrieved 10 June, 2014, from United States Census Bureau: http://www.census.gov/popclock/

TABLE 1: Top Malaysia's Halal product import origin from 2010-2013

Rank	Country	Nation Status	Total Halal Import from Malaysia (RM)
1	China	Developing	13,783,320,570
2	United States	Developed	9,688,525,657
3	Singapore	Developed	8,761,066,185
4	Netherlands	Developed	7,258,963,582
5	Japan	Developed	6,306,680,493
6	Indonesia	Developing	5,777,830,275
7	Thailand	Developing	5,024,292,301
8	India	Developing	4,737,787,541
9	South Korea	Developed	4,199,030,001
10	Australia	Developed	3,237,944,429

Source: Halal Development Corporation (HDC) Malaysia, 2014

TABLE 2: Malaysian Halal Export values, 2013

Major Halal Exported Products	RM (billion)
Food and Beverages	13.27
Ingredient	10.62
Palm Oil Derivatives	4.83
Industrial Chemical	1.69
Cosmetic and Personal Care	2.03
Pharmaceutical	0.41

Source: Halal Development Corporation (HDC) Malaysia, 2014

TABLE 3: Types and description of variables

Variables	Dependent / Independent	Description
Ex_Hal_{it}	Dependent	Annual export of Malaysia's halal product to importer country in USD currency (*Exchange rate of RM/USD on the last day of the year is being used for the currency conversion*)
GDP_{it}	Independent	Real per capita importer Gross Domestic Product in USD currency
FC_GDP_{it}	Independent	Percentage of importer final consumption expenditure over GDP
POP_{it}	Independent	Importer population size

TABLE 4: Summary of Variables, Expected Signs and Sources of Data

Variables	Expected Signs	Sources of Data
Halal Export	Dependent	Halal Industry Development Corporation
Gross Domestic Product of Importer	Positive	World Development Indicators
Final Consumption (% to GDP) of Importer	Positive	World Development Indicators
Population size of Importer	Positive	World Development Indicators

TABLE 5: Descriptive statistics of Malaysia's Halal Export to 44 developing countries, 2010-2013

Variables	Obs	Mean	Std. Dev	Min	Max
Halal Export	176	15.88	2.60	8.47	21.00
Gross Domestic Product of Importer Country	176	8.09	1.01	5.42	9.59
Final Consumption (% to GDP) of Importer Country	176	4.39	0.16	3.87	4.82
Population size of Importer Country	176	17.21	1.48	14.06	21.03

TABLE 6: Breusch-Pagan Lagrange Multiplier and Hausmantests Result

Test	Chi Square	Probability (*p*-value)
LM test	131.05	0.0000 (significant at 1%)
Hausman test	49.67	0.0000 (significant at 1%)

TABLE 7: Summary Result of Malaysia's Halal Export to 44 developing countries, 2010-2013

Variables \ Models	Pooled OLS	REM	FEM
Constant	-12.570 (5.693)**	-16.581 (8.987)**	-147.170 (62.150)**
Gross Domestic Product of Importer	0.587 (0.143)***	1.123 (0.259)***	3.539 (0.731)***

Final Consumption (% to GDP) of Importer	0.071	-0.329	-2.597
	(0.922)	(1.413)	(1.897)
Population size of Importer	1.359	1.442	8.471
	(0.0973)***	(0.189)***	(3.890)**
Number of Observations	176	176	176
Number of Groups	44	44	44
Wald Chi Sq./ F-Statistics	82.70	80.88	25.45
Prob.>Chi Sq/F-Statistics	0.0000	0.0000	0.0000

*Note: *** and ** indicate the level of significance at 1% and 5% respectively. The variables inside the bracket are standard errors. All variables are in logarithm form.*

TABLE 8: Heterocedasticity and Serial Correlation Tests Results

Test	Wald Chi Sq./ F-Statistics	Probability (*p*-value)
Heterocedasticity	31980.35	0.0000 (significant at 1%)
Serial correlation	11.238	0.0000 (significant at 1%)

TABLE 9: Summary Results of Malaysia's Halal Export to 44 developing countries, 2010-2013 with comparison between fixed-effects and fixed-effects cluster code

Variables \ Models	FEM Cluster Code	FEM
Constant	-147.170 (102.217)	-147.170 (62.150)**
Gross Domestic Product of Importer	3.539 (1.008)**	3.539 (0.731)***
Final Consumption (% to GDP) of Importer	-2.597 (2.030)	-2.597 (1.897)
Population size of Importer	8.471 (6.194)	8.471 (3.890)**
Number of Observations	176	176
Number of Groups	44	44
F-Statistics	13.10	25.45
Prob.>F-Statistics	0.0000	0.0000

*Note: *** and ** indicate the level of significance at 1% and 5% respectively. The variables inside the bracket are standard errors. All variables are in logarithm form.*