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3 authors:

Shahriar Kabir
Independent University, Bangladesh
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Roger Lawrey
University of Southern Queensland
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Halal Market Emergence and Export Opportunity: The Comparative Advantage Perspective

Shahriar Kabir1, Syed Shams2 and Roger Lawrey2

1 Monash University Malaysia

2 University of Southern Queensland

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Abstract. The comparative advantage theory of international trade states that countries should export commodities for which they have high comparative advantage and import commodities for which they have low comparative advantage. Analyzing the Halal trade flows for Malaysia's 11 food/food-related commodities from 1991 to 2012, this study finds an interesting development of the standard view of comparative advantage in the emerging Halal export market. It finds that the greater the country's current comparative advantage in an exported good, the higher the risk of export diversion (one- or two-way causality) between the Halal market and the conventional market with the country's expansion of Halal exports; while the diversion risk disappears with lower current comparative advantage. Thus, the study suggests that if a country wants to take advantage of the fast-emerging market, it should aim to expand export of commodities with

relatively low current comparative advantage but high demand in the emerging market.
Keywords: Trade, Comparative Advantage, Halal

1. Introduction

International trade literature has largely been dominated by the traditional Ricardian view of comparative advantage - countries should export commodities for which they have low real cost and high efficiency advantages compared to other commodities they could produce, and should import those commodities for which their production cost is relatively high and with comparatively low efficiency (Aldrich, 2004). Relatively recently, the concept of dynamic comparative advantage has improved the static nature of competitiveness, sectoral productivity (Levchenko and Zhang, 2016) and factor endowment that has been embedded in the Ricardian view of comparative advantage (Nishimizu and Page, 1986; Bond et. al., 2003). The idea emphasizes changes in price competitiveness and factor productivity through factor price equalization and improvement in human and physical capital.

In spite of the long history of the comparative advantage literature in explaining international trade, the theory demonstrates less about how a country could conduct its trade policy (Costinot et. al., 2015). For example, how specialization and factor endowment can guide in export expansion to a new market. Understanding this link is important in identifying the potential sectors for entering a new market without causing diversification of existing exports.

International trade in Halal products is increasing in importance in the context of a growing Muslim population of over 2 billion people. However, the Halal issue is no longer limited to religious and social perspectives but is becoming increasingly significant from an economic and business perspective. A recent report by the Gulf News (2016) claims that size of the

Halal market will exceed $3.7 trillion by 2019.[1] Countries such as Australia, Canada, China, South Korea and USA are assessing the future trade opportunities from the emergence of the Halal market (International Markets Bureau, 2011). Despite this growth and high potential, the halal market appears to be an unexplored opportunity for international trade. In response, this study explores whether the theory of comparative advantage can predict the market diversification risk that may arise from expansion of exports to the Halal market besides existing exports to the conventional market. Thus, this study extends that of Costinot et. al. (2015) exploring the implementation of comparative advantage theory for designing the trade policy of a country.

Since Malaysia is a Muslim majority country with extensive emphasize on Halal export expansion as mentioned in their national trade policy, this study analyses Malaysia's exports for 11 major food/food related commodities from 1991 to 2012. The study finds that Halal export expansion for the commodities with high comparative advantage are associated with the risk of long-run/short-run trade diversion from existing exports, which may not happen for the commodities with relatively less comparative advantage.

This result establishes a linkage between comparative advantage theory and trade diversion risk of new market exploration. If the nation enters an emerging market with the commodities for which they are already specialized, export expansion raises the risk of diverting some efficient resources from existing firms to the new firms, which will ultimately create pressure on wage levels and productivity of existing firms thus making these firms less competitive in the global market. Instead, the commodity selection strategy for a new market entrant should focus on consumer demand (as highlighted by Fieler, 2012; Jaimovich and Merella, 2012, 2015) of the target market and link that potential demand to the domestic

[1] For detail, please see http://gulfnews.com/gn-focus/special-reports/events/halal-market-to-top-3-7-trillion-by-2019-1.1664332

industries with relatively less specialization and less comparative advantage. This finding coincides with previous studies of Redding (1999), Barnes et at (2004), Acharya (2008) and Nunn and Trefler (2013) that support and explain the dynamic nature of comparative advantage.

The article is organized as follows. The next Section explains the theoretical framework followed by model estimation and result discussion in Section 3. Section 4 links the identified trade diversion risks to the standard comparative advantage theory of international trade. The last Section concludes the paper.

2. Theoretical Framework

Following Kabir (2015), this study develops a framework to assess the trade diversion risk of a new market exploration. The model relies on a three-directional trade flow concept originated from two sources; one is the target exporter (Malaysia in this study) and the other is the rest of the global market (Fig. 1). From Malaysia, trade flows to two directions. First, export to the global market, which is Malaysia's total export for a particular commodity. This paper categorises this trade flow as Malaysia's export position (MY_TO_W). The second trade direction is from Malaysia to the Halal market, that is, exports of Malaysian Halal food to the countries that are identified as the key Halal market. This particular trade flow indicates Malaysia's current position in exporting a particular food commodity to the Halal market; hence termed as exporter's Halal market position (MY_TO_HM). The third direction of the model is the trade flow from the global market to the key Halal market. More specifically, this is the total imports of Halal food by the key Halal market which reflects the Halal market potential.

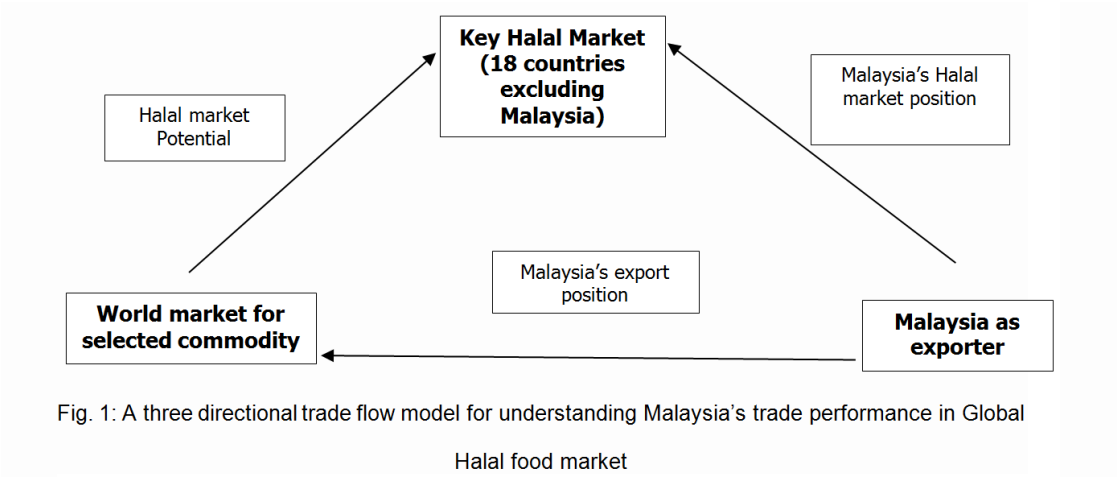

Fig. 1: A three directional trade flow model for understanding Malaysia's trade performance in Global Halal food market

The theory of competitive advantage espouses the idea of utilizing competencies and/or resources to convert comparative advantage into competitive advantage (Gupta, 2015). In contrast, the theory of dynamic comparative advantage supports building up competitiveness through long-term industry policies and domestic institutional support even for commodities that currently have relatively less comparative advantage (Barnes et at, 2004; Nunn and Trefler, 2013). Thus, the question arises whether countries should focus on building competitiveness for new market entrance for the commodities they already have high comparative advantage, or should they develop industrial policy for improving competitiveness of commodities for which they have relatively less comparative advantage so that these commodities can capture a larger share of the new market. The answer to this question depends on identifying whether export expansion for a commodity to the new market would cointegrate with existing exports. In other words, if a new market export granger causes existing exports, there is a risk of export diversion (for detail about Granger causality, please see Narayan and Smith, 2006). In this Halal model, Malaysia's export position (MY_TO_W) represents existing exports and Malaysia's Halal market position (MY_TO_HM) represents entrance of new market. Cointegration between these two variables explains the risk of export diversion between existing exports to the global market and expansion of the Halal market.

2.1 Data

Malaysia's export position (MY_TO_W) refers to Malaysia's total exports for any particular commodity. This data is directly retrieved from UNComtrade database. This relation can be defined as:

$$MY\_TO\_W_t = \sum \exp orts_{W,t} \quad \ldots\ldots\ldots (1)$$

Here, W denotes exports to the world market, and t is the specific year. Calculation for the value of Malaysia's Halal market position (MY_TO_HM) requires trade flow identification for each country of the key Halal market. This study calculates Malaysia's Halal market position for a specific commodity by summing of the exports of that commodity to each country of the key Halal market. Thus, the equation stands as:

$$MY\_TO\_HM_t = \sum_{i=1}^{n} \exp orts_{i,t} \ldots\ldots\ldots (2)$$

Here, i denotes exports to the country that belongs to the key Halal market, n is total number of countries that are included in key Halal market (for this study, n=18), and t is the specific year. All data for Equations 1 and 2 are collected from UNComtrade database.

This study concentrates to Malaysia's top 11 food/food related export commodities, which are Beverage (non-Alcoholic), Cocoa Butter and powder, Coconut (copra) oil, Coffee Extracts, Fatty acid, Hydrogenated oil, Palm oil, Palm kernel oil, Pastry, Soybean oil and Sugar Refined. These commodities are taken from the list of Malaysia's top 25 export commodities for the year 1991-2012.[2] For each commodity, the trade destinations are 18 major Halal markets as suggested by the Government of Canada (Global Halal Food Market, 2011).[3]

3. Econometric Modeling and Analysis of Data

This study employs cointegration for testing trade patterns and common trends of Malaysian exports in multivariate time series. Cointegration exists between two or more non-stationary time series provided same order of integration are present for those series. If two variables are cointegrated, there exists an error correction data generating mechanism (Engle &

[2] Commodities are selected based on export food commodities list published by FAOSTAT and export data provided by Ministry of International Trade and Industry (MITI).

[3] Please see Section 2 for detail of the list

Granger, 1987; Johansen, 1988). The cointegrated variables would not drift apart over time. This concept provides insight into the long run relationship between the two variables and testing for the cointegration between two variables.

This paper identifies the cointegration between exports from Malaysia to the Halal market (MY_TO_HM) and exports from Malaysia to the world as a whole (MY_TO_W). More specifically, the objective of this paper is to see if Malaysian exports are affected by their exports to the Halal market. Both variables in this paper are converted into log forms such as LNMY_TO_HM and LNMY_TO_W for statistical purposes (Stewart, 2005).

Cointegration analysis proceeds as follows. First, the number of lags is identified using lag length criteria followed by the testing whether the data series have same order of integration. Next, if these series are integrated in the same order, then a cointegrating regression is estimated and tested. Only if non-cointegration is rejected, the estimation of an ECM is to be attempted. Hence, the empirical investigation of this paper is performed into four main steps. First, we select the Lag Length. Second, we estimate the Unit Root Test, Third, we perform Cointegration Analysis and finally, we estimate VAR Model.

3.1 Cointegration Analysis

Table 1: Cointegration Regression

Name of the Commodity	No. of CE(s)	Trace Statistic	Decision	Max-Eigen Statistics	Decision
Cocoa Butter and Powder	None	0.0343	Reject null hypothesis	0.0612	Do not reject null hypothesis
	At most 1	0.0901	Do not reject null hypothesis	0.0901	
Coconut (Copra) Oil	None	0.7869	Do not reject null hypothesis	0.7397	Do not reject null hypothesis
	At most 1	0.6663		0.6663	
Fatty Acid	None	0.0132	Reject null hypothesis	0.0127	Reject null hypothesis
	At most 1	0.2539	Do not reject null hypothesis	0.2539	Do not reject null hypothesis
Hydrogenated Oil	None	0.0046	Reject null hypothesis	0.0179	Reject null hypothesis
	At most 1	0.0265	Reject null hypothesis	0.0265	Reject null hypothesis
Palm Kernel Oil	None	0.6545	Do not reject null hypothesis	0.5693	Do not reject null hypothesis
	At most 1	0.9695		0.9695	
Palm Oil	None	0.0000	Reject null hypothesis	0	Reject null hypothesis
	At most 1	0.8028	Do not reject null hypothesis	0.8028	Do not reject null hypothesis
Pastry	None	0.0297	Reject null hypothesis	0.0325	Reject null hypothesis
	At most 1	0.2145	Do not reject null hypothesis	0.2145	Do not reject null hypothesis
Soy Bean Oil	None	0.4326	Do not reject null hypothesis	0.611	Do not reject null hypothesis

	At most 1	0.1297		0.1297	
Sugar Refined	None	0.0072	Reject null hypothesis	0.0366	Reject null hypothesis
	At most 1	0.0172	Reject null hypothesis	0.0172	Reject null hypothesis

Note: None
Null hypothesis: There is no co-integration among variables; Alternative hypothesis: There is co-integration among variables
At most 1
Null hypothesis: There is at most one co-integration model; Alternative hypothesis: There is more than one co-integration model
Source: Author's calculation.

Table 1 shows the result of cointegration regression to understand if there exists any co-integration between LNMY_TO_HM and LNMY_TO_W for any of these commodities.[4] Based on the ADF tests, we exclude two commodities (non-alcoholic beverage and coffee extract) from our analysis and use the remaining nine commodities that have same order of integration. The commodities include cocoa butter and powder, coconut (copra) oil, fatty acid, hydrogenated oil, palm kernel oil, palm oil, pastry, soy bean oil and sugar refined. Cointegration regression shows that there exist cointegrating relations between LNMY_TO_HM and LNMY_TO_W for fatty acid, palm oil and pastry[5] and no cointegration for coconut (copra) oil, palm kernel oil and soy bean oil.

Unlike other commodities, trace statistics and max-Eigen statistics tests show conflicting result for cocoa butter and powder. According to trace statistics, there is sufficient evidence to conclude that there is 1 cointegrating equation between LNMY_TO_HM and LNMY_TO_W while max-Eigen statistics show that there is no cointegration between LNMY_TO_HM and LNMY_TO_W for cocoa butter and powder.[6]

3.2 Vector Autoregressive (VAR) Model

Table 2: Vector Error Correction Model

Commodity Name	Causality Indicator	Coefficient	p-value	Chi Square	Decision
Fatty Acid	Long Run Causality	-0.094	0.0215		Negative coefficient and significant p-value
	Short Run Causality			0.7584	Do not reject null hypothesis
Hydrogenated	Long Run Causality	0.398	0.0044		Positive coefficient but significant p-value
	Short Run Causality			0.0033	Reject null hypothesis
Palm Oil	Long Run Causality	-0.104	0.1055		Negative coefficient but non-significant p-value
	Short Run Causality			0.1089	Do not reject null hypothesis

[4] Instead of comparing the value of trace or max-Eigen statistics against critical value, the p-values are observed here and compared to critical value, α of 0.05.
[5] Since p-value< α (none), the null hypothesis is rejected
[6] As noted previously, result from maximum eigenvalue test should be considered when these two tests show a conflicting result.

Pastry	Long Run Causality	-0.090	0.0030		Negative coefficient and significant p-value
	Short Run Causality			0.5930	Do not reject null hypothesis
Sugar Refined	Long Run Causality	0.0595	0.4814		Positive coefficient and non-significant p-value
	Short Run Causality			0.2737	Do not reject null hypothesis

Source: Author's calculation.

Table 2 shows that out of the five commodities, only fatty acid and pastry indicate long run causality from LNMY_TO_HM to LNMY_TO_W. From the Wald test results, only hydrogenated oil shows short run causality running from LNMY_TO_HM to LNMY_TO_W.[7] This means that Halal export expansion of fatty acid and pastry would influence existing exports in the long-run, whereas, expansion of Halal export for hydrogenated oil would influence existing exports in short-run.

The overall findings show Fatty acid, Hydrogenated oil, Palm oil, Pastry and Sugar Refined show causality between Malaysian export expansion to Halal market and its regular export to the world market. Among others, Cocoa Butter and powder, Coconut (copra) oil, Palm kernel oil and Soybean oil do not show any such short/long-run relationship. Data for Beverage (non-Alcoholic) and Coffee Extracts do not fit for co-integration analysis.

4. Discussion of results

Table 3: Summary of co-integration relationship and comparative advantage

Selected commodity	**Average annual export in mil (US$) (2001-2012)**	**Percentage of Aggregated Annual export**	**Rank**	**Relationship observed**
Beverage Non-Alcohol	132.32	0.0995%	8	Does not fit for co-integration analysis
Cocoa Butter and Powder	433.03	0.3255%	5	No short/long-term relation
Coconut (Copra) Oil	121.11	0.0910%	9	No short/long-term relation
Coffee Extract	144.04	0.1083%	7	Does not fit for co-integration analysis
Fatty Acid	901.18	0.6775%	3	Long-term two-directional association between MY_TO_HM and MY_TO_W
Hydrogenated Oil	1376.93	1.0351%	2	Short-term two-directional association between MY_TO_HM and MY_TO_W. Long-term one-directional association from MY_TO_W to MY_TO_HM.
Palm Kernel Oil	516.40	0.3882%	4	no short/long-term relation
Palm Oil	8358.71	6.2836%	1	Both short-term and long-term one-directional association from MY_TO_W to MY_TO_HM.
Pastry	241.42	0.1815%	6	Long-term two-directional association between MY_TO_HM and MY_TO_W
Soy Bean Oil	117.20	0.0881%	11	no short/long-term relation
Sugar Refined	118.01	0.0887%	10	Long-term one-directional association from MY_TO_W to MY_TO_HM.
Total share		9.3670%		

[7] Hydrogenated oil has chi square value of 0.0033 which is lesser than α, thus null hypothesis is rejected

Note: High ranking indicates to higher comparative advantage; any short-/long-term association indicates to risk of future trade diversion between Malaysia's Halal export expansion and existing export. Source: Author's calculation.

Table 3 shows the link between cointegration of commodities and the comparative advantage theory. Consistent with theory, commodities with higher export share reflect high comparative advantage (Deardorff, 1980; Bernhofen and Brown, 2004). As such, we ranked the commodities based on the annual average export share from 2001 to 2012. The percentage share of exports and related ranking are presented in Column 3 and 4 of Table 3. Palm oil alone represents 6 per cent export indicating Malaysia's high competitive advantage for this commodity, Hydrogenated oil being second with 1 per cent export and Fatty acid being third position with 0.6 per cent export share. All three commodities show evidence that expansion of Halal export for hydrogenated oil would block growth opportunity for world export.

Among others, Cocoa Butter and powder, Palm kernel oil and Pastry hold 0.1 to 0.4 per cent export share, reflecting Malaysia's moderate level of comparative advantage. Halal export expansion for Cocoa Butter and powder and Palm kernel oil do not show any evidence to affect existing export. Expansion of Halal pastry export will affect the conventional export; however, this effect can be overlooked since Malaysian pastry industry has low market potential in conventional market.

Coconut (copra) oil, Soybean oil and Sugar Refined each represents less than 0.1 per cent of Malaysian export which indicates Malaysia's relatively low comparative advantage for these commodities. Only refined sugar shows that future expansion of world export (to conventional market) would cease the potential for Halal export expansion. However, considering low comparative advantage, this fear may not be valid provided Malaysian refined sugar does not have substantial growth potential in the conventional market. The other two commodities (Coconut (copra) oil and Soybean oil) do not show any causality between Halal export and world export.

The results support the hypothesis that new market exploration raises the risk of trade diversion for commodities with high comparative advantage.

To reduce this risk, countries should develop competitiveness for commodities with relatively less current comparative advantage through long-term industrial policy and institutional support.

5. Conclusion

This study has discovered an important extension of comparative advantage theory in international trade. Expansion of Halal exports for commodities with relatively lower comparative advantage may offer better future trade creation opportunities. This idea can be supported by the emerging and specialized nature of the market as well as involvement of religious sentiment. Since Halal food is related to religious beliefs, consumers are often willing to accept higher price for Halal food (Kamaruddin et al, 2012). This sentiment allows producers to cover any additional cost caused by low comparative advantage. The idea is consistent with Hallak (2006, 2010), Faigelbaum et al (2011), Fieler (2012) and Jaimovich and Merella (2012, 2015) that the income level of the importer country plays an important role in deciding exporters' comparative advantage intensification. Thus, focusing on commodities with relatively lower current comparative advantage appears to be an effective policy for export expansion to the emerging Halal food market as long these industries are supported with effective institutions and industry policies. In general, demand of importing countries, improving competitiveness and attaining dynamic comparative advantage better explains exploration of a new market, which the Ricardian comparative advantage theory alone fails to explain.

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