Media Trend Vol. 10 No. 1 Maret 2015, hal. 56-74 | ***ISSN : 1858 - 1307***
E-ISSN : 2460 - 7649

BILATERAL COMPARATIVE ADVANTAGES: INDONESIA AND MALAYSIA CASE

Ni Putu Wiwin Setyari
Universitas Udayana
e-mail: wi2nset@yahoo.co.id

ABSTRACTS
This studytried tolook more closely at market integration, through export prices channel, inIndonesiaandMalaysia. Severalpreviousstudiestendtorejectthe existence oflawofoneprice(LOP). The law of one price (LOP) states that price a given product should be the same in different parts of the world if valued in common currency. However, empirical studies uniformly shows LOP does not describe most markets. Someimportantfactorsthat are consideredinstrumentalin this regardaretransportation costsandprice stickiness. However, there isone characteristicthat is oftenoverlookedin the discussion ofLOP, namelychanges incomparative advantage. The specific objectiveofthispaperis to look atcomparative advantagecorrelationbetween the two countriesandtheir effect onpriceconvergence. Correlationof both selected commodities –using therankspearman's test -indicates the nature ofthemutualsubstitutionof productsthatcarrythe possibility of"price competition" so thatthe pricepointtoconvergeto one another. Tests on theexportprice ofsomeselected productsinboth countriesindicatedthe occurrence ofpriceconvergence, seen from thetwoanalytical techniques: σconvergenceandco-integrationusingJohansen's test. This conclusion is generated by attempted to control the "identical assumption" is to examines prices for similar products (homogeneous) using SITC 3-digit, which is produced from the "same" or close locations, with the export destination to the same trading partner

JEL Classification: F100, F110, F140
Keywords: export price convergence, comparative advantage, law of one price

INTRODUCTION

The law of one price (LOP) states that price a given product should be the same in different parts of the world if valued in common currency. However, empirical studies uniformly shows LOP does not describe most markets. A unique price would only exist for homogenous goods, yet not for others that can be differentiated. In reality the law of one price is flagrantly and systematically violated by empirical data (Isard, 1977). Engel and Rogers (1999) use disaggregated data on consumer prices to determine why there is variability in prices of similar goods across U.S. cities. They find that variability is larger for traded-goods. Distance between cities and nominal price stickiness accounts for a significant amount of the variation in prices between pairs of places (see also Bukenya & Labys 2002). However,severalotherstudiesthat useaspecificproductindicatingthe achievement ofLOP, for example, a study byAscheetal. (1998). The empirical evidence indicates that there is one whitefish

market in France. Moreover, the relative prices of different product forms of cod are consistent with the law of the one price.

There are more reasons, both static and dynamic, for expecting deviation from the law of one price (Kravis et al, 1977). A static circumstance giving rise to price discrimination between destinations is that in at least some sectors there are oligopolistic firms facing different elasticity of demand in each foreign market. Price discrimination may come when the constellation of rivals difference from market to market or when the exchange rate of different destination countries moves differently with respect to the oligopolies' home currency. In addition, dynamic factors associated with changes in competitive advantage and changing market share make it possible for one source of supply to be selling at lower prices over time. Selling at a low price is the traditional way of breaking into a market and expanding market share.

Some other arguments focus on the presence of non-tradable inputs of production as a major reason for the failure of the LOP. Finally, errors in data and definitions of various prices are another explanationfor some of the deviations. Presuming that measurement errors are white noise, they should not alter long-run tendencies and thus are not a valid explanation (Miljkovic, 1999).

Differences inpricesacross the worldactuallyare something normalbecause of thepresence of different transport cost. When after corrected with the transport cost the prices are different, then the residual reflects the ineffectiveness of commodity trade between spatial (the existence of barriers on international markets) or market segmentation (occurs if the firm to discriminate between countries by providing different prices).There also persistent evidence that price discrimination by sellers to different markets is quite common in international trade. The exporter's gives lower price in country which have more elastics demand. The information from abroad suggested that price differentiation between various markets was more widely practiced by European suppliers than by U.S firms and still more by Japanese exporters (Kravis et al, 1977). This kind discrimination often implies market segmentation and market power. It is worth emphazing the relationship between integration and segmentation and the nature of competition (Golberg & Knetter, 1997). Any perfectly competition market is characterized by condition that price equal cost. Therefore a perfectly competitive market must be integrated. However, a market that is integrated may or may not be perfectly competitive.

The role ofcomparative advantageis akey factor thatis relativelyrarely discussedin the testing ofLOP. In the theories of international trade, comparative advantage is an important concept for explaining pattern of trade. David Ricardo (1817) firstly introduces the concept of comparative advantage with very strict assumptions. It is then well recognized as the Ricardian model. In the modern theories of international trade, such strict assumptions are replaced with the more realistic ones. Heckscher (1919) and Ohlin (1933) examine the effect of different factor endowments on international trade. Their model, which is well known as the Heckscher-Ohlin (HO) model, concludes that a country will export commodity uses the abundant factor of production, while it will import commodity uses the scarce factor of production. Some economists argue that a country's comparative advantage is dynamic, instead of static (Widodo,2009).

A country's comparative advantage might change due to the changes in supply and demand sides in both domestic and international markets. The supply side is related to PPF. Meanwhile, the demand side is related to community preferences. Correlation ofcomparative advantageheld by thetwocountriescan be used asan indicator of whethertheyhave specializedinthe sametype ofgoodsornot. The higherofcomparative advantage correlation value of both,the

moresimilarproductspecialization. Products exported byboth countriescan besaid to bemutualsubstitution. Conversely, ifthe correlation issmall, then thetwo countriesspecializeindifferent productsandsaidcomplementary.

This paper present the trade pattern in two countries which having much similarities, namely Indonesia and Malaysia. Both arelocatedin Southeast Asia, have a common languageisMalay, andevenshare aborderstate. Being partof theASEANmembersrequiring themtofollowthe conditionsrequired forregionalintegration, including thefree trade agreementamong the members. In addition,eachstatealso conductsbilateralfree tradeagreementswith other countries. Comparisonswill be made toseehowthe pattern ofeach country'stradewith the same trading partnerandthe same productsoobtainedthe propercomparison. This is very important to control any differences which might over come from destination and transportation cost imposed in goods export prices. One of condition for the prices of internationally traded goods to be identical in different markets is transport cost must be zero or 'equal' for all origins to each destination. As Goldberg & Knetter (1997) suggest that the main weakness of LOP study is that they typically compare prices of goods that are produced and sold in different locations, both serious violations of the identical goods assumption. Makecomparisonsof similar goodsmadein thetwocountrieswithsimilarcharacteristicsandcommon destinations willcontrol thepossibility ofsuchbiases.

The purposeofthispaperisa closerlook atconvergencein the pricesof products soldinIndonesiaandMalaysiaforsome ofthe sametrading partners. The technique usedis the pricedispersionandco-integrationusingJohansen's test. It is postulated that they have 'same export prices for similar product' since they places in relatively same long distance to their trading partners. Hence theyface relatively sametransportcost, andtherefore the prices in both countries will co-integrate. The specific objectiveofthispaperisthe take into account comparative advantagecorrelationsin the two countries, whichare stillrelativelyrarely mentionedin LOP discussions, tosee thepossible impact onpriceconvergence. Comparative advantage derives from differences across countries in the fudamental determinants of supply and demand. So far, the dynamic theory of comparative advantage has put greater attention on the changes in supply (production) side. Correlation ofthe two willindicatewhether thecommodityis sold inboth countriesare substitutesorcomplementary.

The paper isorganized as follows. The first sectioncontains anintroduction tothe issues raisedinthispaper.The second sectioncontainsa briefreviewdiscussesthe theoryofthelaw ofoneprice,method to analyzepriceconvergence, andthe role ofcomparative advantagein it.The third sectionwilldiscussthe results ofthe analysis, andpartfour willgoon theconclusions.

THEORITICAL FRAMEWORK

Goods Prices and Exchange Rate

The definition of market integration is what we call the Law of One Price (LOP). Prices of goods are geographically arbitraged and, adjusted for tariffs and transport costs, they are equalized in different locations. Homogeneity, information and perfect competition assure this result (Dornbusch,1985). Let p_d, p^*, and e denote the domestic currency price of good 's' in the home country and currency, the foreign currency price, and the home currency price of foreign exchange (exchange rate). Arbitrage then implies:

$p_d=ep^*1)$

Simply put, LOP states that once prices are converted to a common currency, the same good should sell for the same price in different countries. Needless to say, the law of one price holds mainly in the breach. Tariffs, transportation costs, and nontariff barriers drive a wedge between prices in different countries with the size of the wedge depend on the tradability of the good.An important implication of complete spatial arbitrage, not only for commodities but for all goods, is the idea that relative national price levels in a common currency are independent of the exchange rate since exchange rate movements merely reflect, passively, divergent national price trends. If the LOP held for all countries for some product we would characterize this as an integrated world market. Because the assumptions of costless transportation, distribution, and resale are unlikely to hold in practice, the absolute versions of the LOP are often modified (Goldberg & Knetter, 1997). Suppose costs of transportation or resale (such as trade barriers) preclude price equalization, but the frictions give rise to a stable price differential across two markets. In this case, we have:

$p_d = \lambda e p^*$ 2)

Whereλ is the real (product) exchange rate or, alternatively, (λ x 100) is the home currency price as a percentage of the foreign. If λ remains constant over time, then common currency prices for a particular product (or market basket) change in same way over time in two countries, and the relative LOP holds. Exchange rate, induced changesin the relative price affect the world distribution of demand and employment. Ideally, a test of the LOP would compare prices for two transactions in which the nationality of the buyers is the only difference in transaction characteristics. In practice, the identical goods assumption is almost surely violated to some degree in available data.

It is perhaps less evident why modification test in equation 2 accommodates product differentiation. Implicitly, these tests rely on George Stigler's (1987)refinement of price discrimination. Price discrimination exists when two or more similar goods are sold at price which is in different ratios to their marginal costs. Empirical studies of the LOP are based on the same idea. If the common currency relative price of a good fluctuates over time between two markets,which is taken as evidence against integration of the markets. The implicit assumption is that the relative costs are not changing enough to account for the price variation. The consistent rejection of the LOP raised serious questions about global monetarism, but believers in an integrated, competitive paradigm viewed the evidence only as proof that goods whose prices were used in testing the LOP were not identical (McCloskey & Zecher, 1984).

Similarity in Comparative Advantage

Key question addressed by the theory of international trade is what determines the pattern of goods exported and imported. One explanation has already been suggested, comparative advantage, which in turn derives from differences across countries in the fundamental determinants of supply and demand.Theories of trade based on the principle of comparative advantage are effectively theories of relative price determination. Since supply and demand determine price, these theories derives their predictions about differences in pre trade relative price across countries, and hence the pattern of trade that will result from these differences.

Two prominent theories of trade based on comparative advantage: the Ricardian theory and the Heckscher-Ohlin-Samuelson (H-O-S) theory. These theories assume perfectly competitive markets and homogenous goods and

focus on supply side determinants of relative prices, namely, factor prices and technology. Briefly, the Ricardian theory explains comparative advantage in term of cost (supply) differences that arise from differences in technology across countries. In, contrast, the H-O-S theory assume technologies are the same across countries and so instead ascribes comparative advantage to cost (supply) differences arising from differences in factor prices across countries (Bowen et al, 1998). However, this concept relates to patterns of pre trade relative prices which are not observable. Inferring comparative advantage from observed data is called revealing comparative advantage (RCA). The RCA index is computed as:

$$RCA = \left(\frac{X_{ij}}{X_{wj}}\right) / \left(\frac{X_i}{X_w}\right) \quad 3)$$

where X_{ij} denotes country *i*'s exports of commodity *j*, X_{wj} is world exports of commodity *j*, X_i is country *i*'s total exports and X_w is total world exports. When value RCA exceeds (below) unity country *i* is said to have a revealed comparative advantage (comparative disadvantage) in good *j*. If the two countries have the same value of RCA, it can be said both have similar advantages.

RCA dynamic changes of a country during a certain period can give a country's trade pattern changes. Similarity of comparative advantage, and therefore the export sector, the two countries can be measured using the correlation coefficient based on ranks: Spearman's ρ test. In the context of the use of time series, spearman correlation may reflect the dynamism of comparative advantage changes - changes in the structure of trade - which is owned by a state. While in testing using the cross section, the correlation would indicate the nature of the product - substitution or complementary - that is sold by the two countries. The ρ is defines as follows (Benedictis & Tajoli, 2003):

$$\rho_{jk} = 1 - \frac{6\sum_i (r_{ij} - r_{ik})^2}{N(N^2-1)} \quad 4)$$

where *j* and *k* are two countries, *i* is a specific sector, and *N* is the total number of sectors. r_{ij} is the rank assigned to sector *i* in country *j* in a specific year *t*. The value of Spearman's rank correlation is between minus one to one. This value can be interpreted both statistically and economically. Statistically, minus one means a perfect negative relationship in rank orders, while a value of one means a perfect positive relationship in rank orders. In other words, the ρ-value of minus one indicates that the export sectors in both countries are perfect complementary, whereas when approaching a value of one, means that the export structure of the two is the perfect substitution. When products are substitutes, competition will lead to price competition, so the trend price difference is getting smaller - smaller variance - and led to price convergence.

Testing for Long Term Price Convergence in LOP

In the view of neo classical, two countries that have similar characteristics will experience long-term convergence. One way to test for this hypothesis is to look at the behavior in one region (Barro, 2004). Differences in technology, preferences and institutions are likely to be smaller than those across countries. This relatively homogeneity means that regions are more likely to converge to similar steady state.

Two concepts of convergence are: First, convergence applies if a poor economy tends to grow faster than a rich one, so that the poor country tends to catch up to the rich one in terms of levels of per capita income or product. This property is corresponding to concept of β convergence (sometime described as "regression toward the mean"). Second, convergence occurs if the dispersion – measured, for example, by the standard deviation of the product prices across a group countries or regions-decline over time. Its called process of σ convergence. Convergence of the first kind tends to generate convergence of the second kind, but this process is offset by new disturbance that tend to increase dispersion. Theoretically, the existence of σ convergence can be seen from the behavior of standard deviation or variance data.

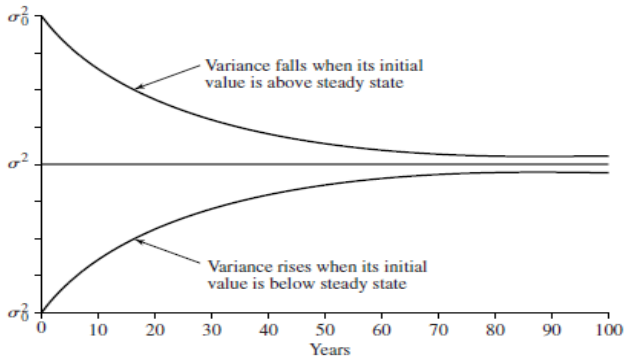


Figure 1. Theoretical Behavior of Dispersion
Source: Barro,2004

Several empirical studies to test the existence of LOP by using the dispersion of prices that occurred in some countries (σ convergence). When the price dispersion between countries fell, the LOP is said to occur. Other studies using Engel-Granger co-integration analysis and the Johansen test with the same purpose. To perform a robustness check, this paper will use those two techniques, σ convergence and co-integration test, for the analysis.Ardeni (1989) suggested that many of the previous studies on LOP and commodity prices are in fact unreliable because either they have failed to explore the time series properties, e.g., non-stationary, of the variables analyzed or they have inappropriately applied various transformations on these variables, e.g., first differencing. Non-stationary invalidates the usual estimation procedures and makes classical asymptotic theory inapplicable. However, even though individual variables may not be stationary, linear combinations of them can be; in this case the variables are said to be co-integrated. Thus, the theory of co-integration gives a way to reconcile findings of non-stationary with the possibility of testing relationships among the levels of economic variables.

The co-integration tests provide evidence about the linkages among prices at different markets. In this light, co-integration is not an absolute test but is a matter of degree. For a given time period, two markets' price series which move together will be highly co-integrated. Conversely, two markets' price series which tend to diverge from each other for ex-tended periods will have low co-integration (Goodwin and Schroeder, 1991).

DISCUSSION

Trade Pattern in Indonesia and Malaysia

In the simplest versions of monetary models of exchange rate determination, deviations from the LOP are not expected for any commodity and, thus, PPP holds strictly. In other models, where a distinction between traded and non-traded goods is made, deviations from the LOP are expected for non-traded goods only. Several studies using the price index (CPI) infer the existence of LOP violations. The most plausible reason of this result is that goods can be traded with non-tradable are not distinguishable. Therefore, in this paper used data real price unit of commodities only for traded goods.

The data used in this paper come from various sources, including the UNCOMTRADE and IMF. By utilizing data from UNCOMTRADE, the year 1980 - 2005, record export and import trade of Indonesia and Malaysia are synchronized in order to look for both commodities exported to the same destination country. Of the many commodities that are both exported by both countries to the same destination country, taken four kinds of commodities by SITC 3-digit, i.e. crustaceans and molluscs (036), coffee and coffee substitutes (071), Spices (075), and wood, simply worked, and railway sleepers of wood (248). States the destination of a trade partner for both these products are U.S., European Union, Singapore, and Japan. The use of unit prices for products that have a higher digit based on the initial assumptions to obtain a relatively more homogeneous product that is more appropriately used in testing the LOP.The four product prices stated in the price per unit. Price is obtained by dividing the total value of trade with the total quantity traded. Trade value is expressed in the common currency, thus meeting the assumptions required. Using real prices are expected to give better test results, because it has separated the influence of the price of goods that are not traded.

Indonesia and Malaysia are close neighbors who have not only a very close distance, but also views of culture and languages are relatively similar. In testing the LOP, the border is a very important factor. Borders are meant here is not only the location - the physical limits of the state - but also the currency and the culture or language. Comparison of some macroeconomic indicators between the two countries can be seen in Table 1.

[Table 1 about here]

In the period of the 1980s, of all the indicators are presented, Indonesia has a relatively greater rate than Malaysia. The population of Indonesia 11 times more than Malaysia with a GDP that is almost four times larger. While inflation was also 3 times higher than Malaysia. Indonesia's current account showed a surplus, while Malaysia is still suffering from a deficit. In 2010, Malaysia's GDP grew 887% from the year 1980 (with a population growth of 115%), while Indonesia's GDP grew by 723% and population by 61%. The most extreme of the two-point difference that year was Malaysia's current account surplus reached 27.3 billion U.S. dollar from 1980 is still a deficit.

Changes in volume of exports and imports of a country often associated with currency exchange rate volatility. In theory, appreciation (depreciation) in currency will respond differently by exporters and importers as both are on opposite sides. Appreciation will encourage the increase in imports, while depreciation will be profitable for exporters. Figure 2 illustrates changes in the

exchange rate of Indonesia Rupiah (IDR) and Malaysian Ringgit (MYR) - against the U.S. dollar - with a change in volume of exports and imports during the years 1980 to 2010. The graph shows the change in the exchange rate of IDR is more volatile, while the MYR exchange rate is relatively stable over time. Ringgit exchange rate stability makes it "hard currency", as compared with the rupiah, thus bringing expectations and beliefs are better for exporters and importers. Exchange rate stability encourages the movement of exports and imports on a unidirectional pattern. Malaysia's current account surplus continued to increase since 1997.

[Figure 2 about here]

The condition is relatively different from what happened in Indonesia, where there is a change in the exchange rate sharply from time to time. The most striking changes seen in the years 1997 -1998 with an increase in the nominal exchange rate (depreciation) is very high. Depreciation was seen followed by a rise in exports, and imports decreased. However, exports and imports both declined look into the year 2000. Compared to Malaysia, the change in volume of exports and imports in Indonesia is relatively correlated with the exchange rate. Pattern shown is also likely to match those predicted, which is an increase in exports (imports) when currency depreciates (appreciates). This comparison shows that changes in exchange rates cannot account for changes in trade patterns in the two countries1, or in other words, exchange rate volatility has a weak correlation with the volume of international trade.

Competitive Advantages and Export Price Convergence in Indonesia and Malaysia

The pattern of trade, especially exports, a country can be attributed to the comparative advantage held by the state. A country will have comparative advantage in a product which he can produce relatively cheaper than other countries. Relatively low cost of production is associated with the development of technologies adopted by the country or more due to the abundance of (scarce) factors of production (endowment) which is owned by a particular country. A country will export (import) where he has a abundance (scarce) factors of production. From the standpoint of the company, production efficiency may result in lower prices so that the competitiveness will be higher.

[Figure 3 about here]

Figure 3 shows that Indonesia's export volume is relatively higher than Malaysia for all categories, except for wood products in 1985. This condition indicates a glimpse of Indonesia has a higher comparative advantage for these products. In this case, the comparative advantages held by Indonesia are caused by the abundance of inputs in the production of related production. Calculations using data from UNCOMTRADE shows the RCA for each of the selected commodities in both countries as presented below.

[Table 2 about here]

[1]Huchet-Bourdon & Korinek (2012) indicates that a depreciation in the exchange rates in Chile and New Zealand would not lead to a strong change in their trade balances with three main trading partners across the board

A country is said to have a comparative advantage (comparative disadvantage) if the value exceeds RCA (less) than unity. The above table shows that Indonesia has a comparative advantage for all products, so that in accordance with the predictions of the Ricardian and HO theories, Indonesia could export those products. Likewise, Malaysia, which has the RCA index above 1 except for coffee and coffee substitute, but the value of the index increased in 2005 for this product type. Malaysia RCA index for wood products is relatively higher than that of Indonesia. However, the RCA index of Indonesia, and Malaysia, declined in 2005, except for crustaceans and molluscs (plus coffee for Malaysia). RCA changes indicate a shift change in CA that could be caused from the supply side - the technology or the availability of endowment - as well as from the demand side - a change in preferences. RCA values differences shows Indonesia and Malaysia have different characteristics in terms of comparative advantage.

As mentioned previously, the correlation between RCA indexes in the two countries can used to view the properties of the products exported by both. The test is done using Spearman's ρ test between countries within a specific period. Correlation values close to unity indicates the nature of the substitution products between the two. The results of the calculations can be seen in Table 3.

[Table 3 about here]

ρ values for relatively high-value wood products even close to one in the period 2005. This suggests that for these products, both properties close to perfect substitutes (homogenous). Relatively high correlation was also shown for coffee and coffee substitutes. On products that are substitutes, will raise the price competition between the two countries as indicated by the "similarity of the price". Therefore, prices in both countries will tend to converge. Opposite correlation was found for two kind products - crustaceans and molluscs and spices - which are substitutes become more complementary, in 2005. It is strongly suspected due to the decrease in the RCA index for these products in Malaysia. Hence, this condition indicates the changing structure of trade in Malaysia. Complementary goods will tend to have different prices between the two.

Table 4 shows the difference in the price of export products provided by Indonesia and Malaysia for several destinations in the period 1980 to 2005.

[Table 4 about here]

Prices imposed by both countries for the same country destinations on the same product has a different pattern, where for various crustaceans and molluscs, fresh, chilled, frozen, Salted, etc, the price of Indonesian exporters are relatively higher compared with that from from Malaysia. If associated with comparative advantage, Indonesia RCA index for these products is higher, which should be followed by lower prices. However, the correlation between them suggests that crustaceans and molluscs products in Indonesia and Malaysia are complementary, making it possible to place both the price difference. Unlike the case with spices products, where prices are from Indonesia is relatively cheaper than those from Malaysia. For this product Indonesia also has a higher RCA index, but the correlations are both relatively small. But for both types of products, prices in both countries seem to be relatively equal. Test results for the four groups of goods showed that there was a significant difference between the means price for the product types crustaceans and molluschs in Indonesia and Malaysia. Tests performed by ANOVA F-test. Significant price difference is also

indicated by the product spices. As for the wood (simply worked, and railway Sleepers of wood) and the coffee there is no significant price difference between the two exporters. This test supports the phenomenon of the high correlation between the two products that make them are substitutes, so that there will be price equality.

Ideally, empirical testing for the LOP must be made to the selling price in two places for similar products and similar destinations. The price differences of the two countries are assumed to differ only in terms of transportation costs. Because the initial assumption, that Indonesia and Malaysia have the same distance to the destination of exports, the means price difference between them indicates a significant possibility of a violation of LOP. However, the results of this analysis are not strong enough to infer the existence of LOP violations, because of different testing two groups for the median (using Chi-squared and Kruskal-Wallis) and the variance does not provide direct conclusions. As noted earlier, the existence of LOP can be tested by looking at the dispersion of prices in some countries, or better known as σ convergence. Figure 4 shows the dispersion of prices in Indonesia and Malaysia to the four selected groups of commodities are traded in the four trading partner.

[Figure 4 about here]

From the figure 4, it appears the behavior of price dispersion (measured by variance) in two countries are different for each commodity. Price dispersion of these two products - spices and wood - tends to be the same in 1980. This could mean that the price given by the exporter Indonesia and Malaysia are relatively equal. Or small variance can also describe the stickiness of prices for such products. Dispersion of prices for coffee and coffee substitute products showed that the variance increases, but tend to fall in recent years and relatively higher in comparison with three other products. Price variance coffee and coffee substitutes quite prominently in the 1990 period, but decreased and approached the initial price dispersion. Price dispersion behavior of the four products is sufficient to say that the dispersion of prices of the two countries has narrowed and approached convergence at one point. The similarity of the characteristics of the two countries can be said to be the most important role in achieving this convergence, as predicted by neoclassical.

Empirical evidence from recent studies is mixed and does not support strongly the LOP hypothesis. Methods they used in testing the LOP vary. The most frequently used procedure in recent years has been co-integration, both bivariate and multivariate co-integration means that although many developments can cause permanent changes in two or more time series, some long-run equilibrium relation exists that ties the series together, represented by their linear combination. One way to formalize the idea of co movements among the prices of a same good in different countries is to use the theory of co-integration.Tests for co-integration developed by Engle and Granger and Johansen and Juselius found their almost immediate place and became very popular method in the LOP studies. However, Goodwin (1992 in Milkjovic, 1999) recognizes that the cointegration tests of Engle and Granger are limited by the fact that cointegration considerations are confined to pairwise comparisons and because such tests require one of the two prices to be designated as exogenous. It was argued (Ardeni 1989) that conventional regression tests of the LOP might have misrepresented or ignored the time series properties of individua price data series. Such properties might have important implications for statistical tests of the LOP. In particular,ignoring serial correlationin an empirical test of the LOP

can yield inferential biases and inconsistencies. Furthermore, empirical tests that use price differentials can suffer because such differencing transformations and filters are ad hoc and might be inappropriate for a given price series.

Meet all the stringent assumptions in the LOP hypothesis testing is quite heavy. The approach attempted in this paper is to find the closest conditionLOP states that the selling price of similar products (homogenous goods) in various countries will be the same when expressed in the common currency. The implicit assumption is the cost of transportation should be relatively the same. Using the same unit price for the product by SITC 3-digit code to confirm the assumptions made above. Transportation costs are relatively the same distance should be reflected from Indonesia and Malaysia that have the same border, so it can be said both countries have the same distance with trading partners. Therefore, prices in Indonesia and Malaysia will experience co-integration.

According to the procedure, the initial testing done to see if all the variables used passed the stationary test. Standard unit-root tests (Dickey and Fuller), performed on all the series to verify the presence of non-stationary. All the series were estimated in difference form, according to:

$$\Delta P_t = \alpha + \delta P_{t-1} + \varepsilon_t$$

5)

Under the null hypothesis δ= 0, the t-ratio for the estimated *p* is distributed according to Fuller's t-like statistic. The results are shown in table 5.

[Table 5 about here]

Stationary test shows that the entire series is stationary so that later on will not give spurious results. The intuition behind the test is as follows. If the series stationary (or trend stationary), then it has a tendency to return to a constant (or deterministically trending) mean. Therefore large values will tend to be followed by smaller values (negative changes), and small values by larger values (positive changes). Accordingly, the level of the series will be a significant predictor of next period's change, and will have a negative coefficient. If, on the other hand, the series is integrated, then positive changes and negative changes will occur with probabilities that do not depend on the current level of the series; in a random walk, where we are now does not affect which way we will go next.

After testing stationary is exceeded, then the variables series are worthy used for further testing to see if the prices in both countries have co-integration. This paper uses Johansen test (the trace test and the maximal-eigen value test) to evaluate the LOP for the price of selected commodities in Indonesia and Malaysia.These tests follow a maximum likelihood estimation procedure that provides estimates of all the cointegrating vectors existing among a group of variables. Johansen's maximum likelihood approach uses test statistics that have an exact limiting distribution that is a function of a single parameter and as such might be advantageous when compared with the bivariate Engle and Granger procedure (Miljkovic, 1999). The results shown in Table 6.

[Table 6 about here]

The entire value of the trace statistic and max-eigen statistic is larger than the critical value, so it can be concluded that the price of selected commodities will experience co-integration. Export prices from Indonesia and Malaysia will achieve balance and lead to a steady state price. However, these tests for co-

integration assume that the co-integrating vector is constant during the period of study. In reality, it is possible that the long-run relationship between the underlying variables change (shifts in the co-integrating vector can occur). The reason for this might be technological progress, economic crises, changes in the people's preferences and behavior accordingly, policy or regime alteration, and organizational or institutional developments. This is especially likely to be the case if the sample period is long.

Co-integration for the price in both countries, we suggest, not only due to the relatively strong correlation of comparative advantage. This condition is also supported because "no borders" between the two countries. These results seem to accordance with the study of Engel and Roger (1999) which indicates that the deviation from LOP can be explained by two factors: distance between locations and the volatility of nominal prices. When we compare the prices of goods across city pairs, the more distant the city pairs the larger the deviations from PLOP. They also find that goods with a large nominal price variance show large deviations from PLOP, irrespective of the distance between locations. They attribute the first of these findings to transportation costs. When goods are sold in distant cities, the economic forces that would work to equalize prices are weaker (see also Foad 2005; Parsley & Wei 1996). Furthermore, markets that are further apart tend to be less similar than those that are closer together, creating different demands and therefore different prices for the same good. Borders are meant here not only in terms of physical constraints, the distance, but also cultural and language differences play an important role2.

CONCLUSIONS

One of condition for the prices of internationally traded goods to be identical in different markets is transport cost must be zero or 'equal' for all origins to each destination. As Goldberg & Knetter suggest that the main weakness of LOP study is that they typically compare prices of goods that are produced and sold in different locations, both serious violations of the identical goods assumption. Make comparisons of similar goods made in the two countries with a location adjacent to each other and have the same trade destinations will control the possibility of such bias. Indonesia and Malaysia are considered to have appropriate characteristics for testing LOP, because their similarity in the characteristics of the country, are at one location and are members of ASEAN enable them open to international trade. As Baffes (1991) empirical suggest that, in most cases, the LOP cannot be rejected as a maintained hypothesis.

International trade patterns are determined by the comparative advantages possessed by each country, one of which is measured from the RCA index. RCA index calculations showed that the two countries, Indonesia and Malaysia, are likely to have different characteristics in terms of comparative advantage. However, the correlation between them indicates that the product they are substitutes, rather than complementary. This will lead both countries to

[2]Parsley and Wei (1996) find that convergence rates to the LOP are significantly higher between cities within the US than those found in cross-country studies. National borders may be significant for several reasons. The presence of trade barriers such as tariffs would tend to limit arbitrage in the same way as transportation costs. Another possibility is that residents of one country may have an affinity for domestically produced goods, the —home bias" in tradeDifferential tax schemes across countries may also have an effect (the same good may receive a different tax treatment in one country than it does in another.) Language and cultural differences my also play a role. Finally, there may be national standards that create natural market segmentation

compete, especially in the price, in order to maintain market share. The nature of this product can be said to lead to the convergence of prices in both countries.

Tests with the analysis of σ convergence, measured by the variance in product prices in the two countries, indicating a trend decline in commodity price variance in the two countries, hence in general we can conclude the convergence rates for the four commodities. To strengthen the analysis, testing of LOP also performed with econometric methods using Johansen's test of co-integration. The result strongly supports the analysis of σ convergence, where all prices in both countries have long-term co-integration.

These results are quite different from the results of previous LOP testing. It could be because in this study, we attempted to control the "identical assumption" which is crucial in testing the LOP. In addition, real data are used goods traded would be more applicable because several previous studies have indicated that LOP failure when tested on the price index, which still contains items that are not traded.

REFFERENCES

Asche, F. et al. 1998. "*Price Founded Test For Market Integration: Fish Market in France*"

Ardeni, P.G. 1989. "Does the Law of One Price Really Hold for Commodity Prices?" *American Journal of Agricultural Economics*, Vol. 71, No. 3 (Aug., 1989): 661-669

Baffes, J. 1991. "Some Further Evidence on the Law of One Price: The Law of One Price Still Holds." *American Journal of Agricultural Economics*, Vol. 68, No. 4(1991):1264-73.

Barro, R. J. and X. Sala-i-Martin, 2004, *Economic Growth* (Cambridge, MA: MIT Press).

Benedictis, Luca De and Lucia Tajoli. 2003. *"*Economic Integration, Similarity and Convergence in the EU and CEECs Trade Structures"

Bukenya, J. O. and Walter C. Labys. 2002. "Price Convergence on World Commodity Markets: Fact or Fiction"

Dornbusch. R..1985. "Exchange Rates and Prices." *NBER Working Papers 1769*

Engel, C. and John H. Rogers. 1999. "Violating the Law of One Price: Should We Make A Federal Case Out of It?" *NBER Working Paper No. 7242*

Foad, H. 2005. "Europe Without Borders? The Effect of the EMU on Relative Prices"

Goodwin, B. K. and Ted C. Schroeder. 1991. "Cointegration Tests and Spatial Price Linkages in Regional Cattle Markets". American Journal of Agricultural Economics, 73 (2), hal. 452-464

Goldberg, P. K. and Michael M. Knetter. 1997. "Goods Prices and Exchange Rates: What Have We Learned?" *Journal of Economic Literature,* 35(3)hal. 1243-1272

Huchet-Bourdon, M. and J. Korinek. 2012. "Trade Effects of Exchange Rates and their Volatility: Chile and New Zealand", *OECD Trade Policy Working Papers*, No. 136, OECD Publishing.

Isard, P. 1977. “How Far Can We Push the "Law of One Price"? *The American Economic Review*, 67 (5), hal. 942-948

Kravis, I. B., Lipsey, R. E., Kalter, E. R.J.. 1977. “Export Prices and Exchange Rates.” *NBER Working Paper No. 182*

Miljkovic, D. 1999. “The Law of One Price in International Trade: A Critical Review.”*Review of Agricultural Economics*, 21 (1)hal, 126-139

Parsley, D. C. and Shang-Jin Wei. 1996. “ Convergence to the Law of One Price Without Trade Barriers or Currency Fluctuations”.*The Quarterly Journal of Economics*, 111 (4), hal. 1211-1236

Widodo, T. 2009, “Dynamics and Convergence of Trade Specialization in East Asia”, *Asia Pacific Journal of Economic and Business*, 13(1)

Zanias, G.P. "Testing for Integration in European Community Agricultural Product Markets." *American Journal of Agricultural Economics*, 44 (3) , hal. 418-27

Appendix

Table 1. Main Economic Indicators of Malaysia and Indonesia, 1980 and 2010

Indicators	Indonesia		Malaysia	
	1980	2010	1980	2010
Population (million persons)	147.490	237.641	13.760	28.251
Current Account Balance (billion U.S. dollar)	2.900	5.643	-0.285	27.345
GDP (billion U.S. dollar)	86.310	708.352	24.938	237.803
Inflation (%)	18.017	5.133	6.724	1.700

Source: World Economic Outlook, IMF

Table 2. RCA Index for Selected Commodities in Indonesia and Malaysia

Commodity Description	Indonesia		Malaysia	
	1985	2005	1985	2005
Crustaceans and molluscs, fresh, chilled, frozen, salted, etc	4.56	6.74	1.18	2.25
Coffee and coffee substitutes	5.53	4.24	0.05	0.28
Spices	9.50	7.13	5.19	1.16
Wood, simply worked, and railway sleepers of wood	2.30	1.12	4.34	1.75

Source: calculated from UNCOMTRADE

Table 3. Rank Spearman Correlation

Commodity Description	Spearman's Rank Correlation (ρ)	
	1985	2005
Crustaceans and molluscs, fresh, chilled, frozen, salted, etc	0.864	0.759
Coffee and coffee substitutes	0.642	0.813
Spices	0.779	0.576
Wood, simply worked, and railway sleepers of wood	0.950	0.995

Source: calculated from secondary data

Table 4. Export Commodity Prices in Indonesia and Malaysia Based on Destinations

Destinations		Commodity Description			
		Crustaceans and molluscs, fresh, chilled, frozen, salted, etc	Coffee and coffee substitutes	Spices	Wood, simply worked, and railway sleepers of wood
European Union	1980	4,377 (2,805)	2,803 (1,277)	1,779 (1,788)	0,386 (0,394)
	1985	3,540 (1,377)	1,814 (1,544)	2,648 (3,397)	0,237 (0,297)
	1990	6,330 (4,749)	0,860 (8,776)	1,752 (1,707)	0,760 (0,508)
	1995	8,546 (6,321)	1,858 (8,577)	2,219 (2,910)	1,287 (0,848)
	2000	6,560 (5,739)	1,340 (2,144)	1,121 (3,915)	0,732 (0,788)
	2005	5,095 (3,947)	1,514 (1,648)	0,809 (1,780)	0,896 (1,006)
United States	1985	6,588 (5,080)	2,287 (3,941)	2,390 (3,451)	0,275 (0,236)
	1990	9,216 (5,343)	0,913 (4,975)	2,131 (1,710)	0,618 (0,326)
	1995	10,154 (5,748)	2,625 (3,940)	2,564 (3,420)	0,912 (0,538)
	2000	10,476 (6,173)	1,539 (2,423)	2,728 (4,541)	0,752 (0,716)
	2005	6,979 (5,558)	1,628 (2,208)	1,122 (2,165)	0,980 (2,648)
Japan	1980	6,071 (5,757)	2,952 (2,831)	1,896 (1,777)	0,277 (0,244)
	1985	6,935 (5,182)	2,495 (1,443)	3,204 (3,364)	0,204 (0,244)
	1990	7,616 (5,781)	1,098 (5,781)	0,958 (1,996)	0,821 (0,391)
	1995	12,333 (9,165)	2,901 (6,705)	2,078 (2,984)	1,225 (0,731)
	2000	10,687 (8,000)	1,143 (3,559)	3,384 (4,781)	0,947 (0,632)
	2005	7,720 (6,904)	1,315 (3,414)	3,258 (2,668)	0,825 (0,144)
Singapore	1980	2,523 (0,321)	2,765 (3,057)	0,806 (1,177)	0,233 (0,179)
	1985	2,117 (0,245)	1,488 (1,477)	0,790 (1,722)	0,182 (0,129)
	1990	4,453 (0,874)	0,859 (1,855)	0,873 (1,046)	0,514 (0,157)
	1995	3,327 (2,471)	2,510 (3,839)	2,344 (2,415)	1,106 (0,299)
	2000	2,057 (1,862)	1,086 (1,817)	3,036 (3,191)	0,531 (0,272)
	2005	1,711 (2,266)	1,641 (1,801)	2,310 (1,623)	0,646 (2,505)

Source: UNCOMTRADE
Note:in brackets is theprice ofexport productstothe samedestination countryofMalaysia

Table 5. Unit Root Test on the Individual Series

Commodity	$\hat{\rho}$	t
Coffe and coffee substitute		
Indonesia	-2.855294	-4.031498***
Malaysia	-0.730629	0.0027***
Crustaceans and molluscs, fresh, chilled, frozen, salted, etc		
Indonesia	-1.197097	-4.811378***
Malaysia	0.996136	-4.399441***
Spices		
Indonesia	-0.652558	-3.107811***
Malaysia	-0.992764	-4.410461****
Wood, simply worked, and railway sleepers of wood		
Indonesia	-1.719103	-4.825232***
Malaysia	-1.013625	-3.576424***

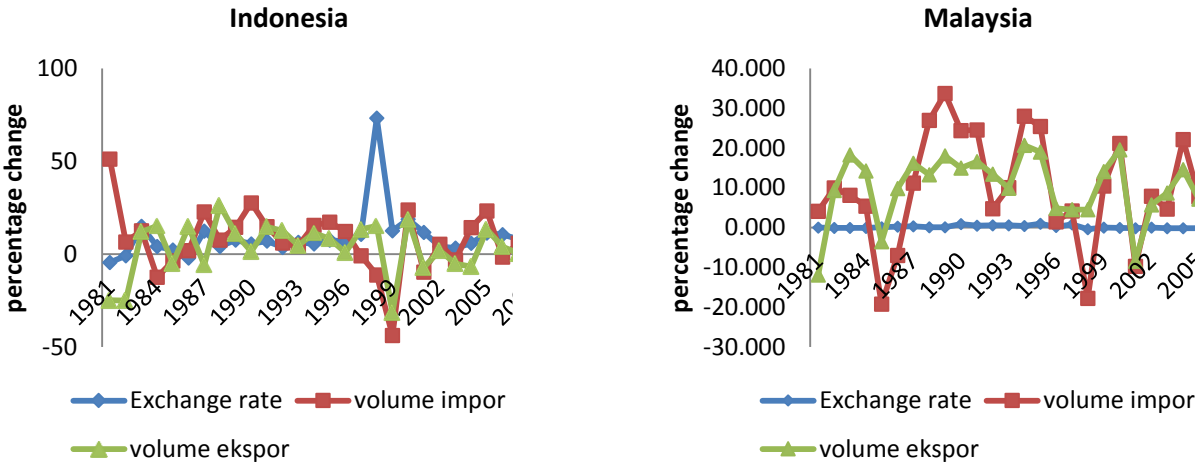
Notes: Theentireseriesindicatesrejection ofnullhypothesis, stationaryinlevel; exceptforIndonesiaspicesare stationaryatfirstdifference.

Table 6. Co-Integration Test on Prices

Commodity Prices	Max-Eigen Statistic	Trace Statistic
Coffee and coffee substitutes	15.84340**	15.84340**
Crustaceans and molluscs, fresh, chilled, frozen, salted, etc	4.159135**	3.841466**
Spices	8.319112**	8.319112**
Wood, simply worked, and railway sleepers of wood	12.16819**	12.16819**

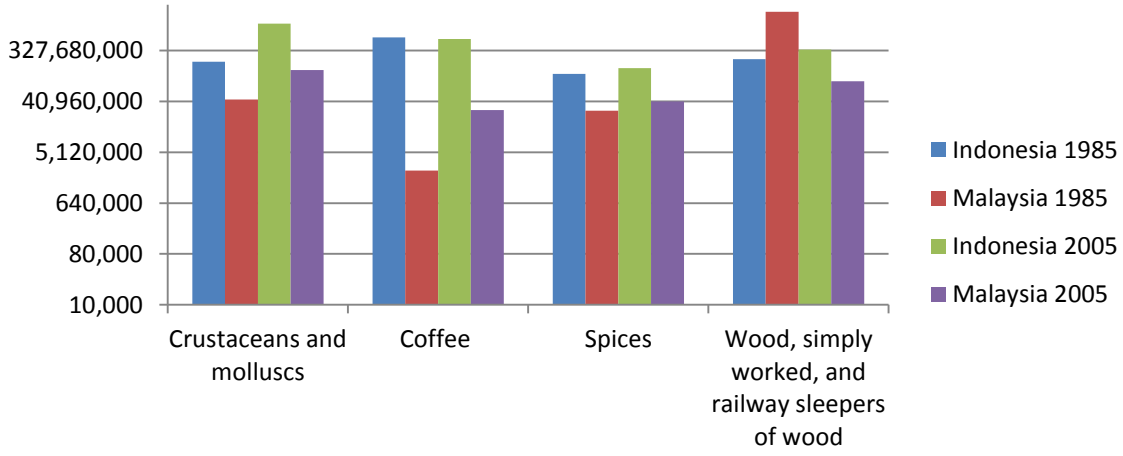
Notes:**signindicatesthetracestatisticandmax-eigenvalue statisticsignificant atlevel0.05 (critical value =3.841466)

Figure 2. Exchange Rate, Export, and Import Changes, 1980-2010



Source: World Economic Outlook, IMF

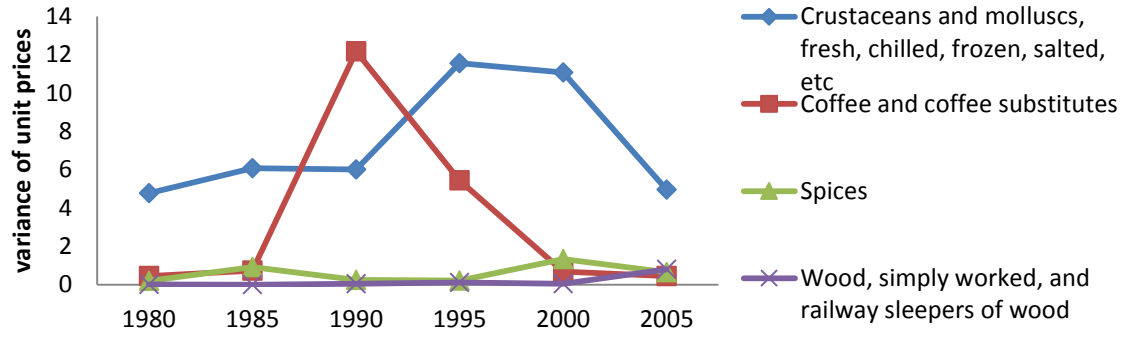
Figure3. Exportvolume ofSelectedCommoditiesinIndonesiaandMalaysia, 1985 and 2005



Source: UNCOMTRADE

Figure 4. Price Dispersion of Unit Prices in Indonesia and Malaysia

ISSN : 1858 - 1307
E-ISSN : 2460 - 7649



Source: UNCOMTRADE