

THE IMPLEMENTATION OF EFFICIENT TRADE MATRIX AND GOLD RESERVE REQUIREMENT FOR COMMODITY TRADE AMONG ASEAN COUNTRIES

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Abstract

Objective - This study attempts to implement the efficient trade matrix among five selected ASEAN countries and its settlement by the gold reserve requirements through Multi-Bilateral Payments Arrangement (MBPA).

Methods – The study is a qualitative research with analytic description. The purpose of this qualitative-descriptive study is to simulate the implementation of gold in the Multi-Bilateral Payment Arrangement among ASEAN countries using the current trade data.

Results – This paper argues that the Southeast Asian countries can solve the problem through their internal coordination, particularly in terms of trade. One of the efforts is to reduce even eliminate the market risk by using the efficient payment arrangement.

Conclusions – The study implied that the quantity amount of gold required to settle the trade balance will be reduced from the early gross payment. However, the ASEAN countries need to strengthen the cooperation among them through maximizing the trade relationship.

Keywords: Asian Crisis, Efficient Trade Matrix, Gold Reserve Requirement, Commodity Trade, ASEAN

Abstrak

Tujuan – Penelitian ini mencoba untuk mengimplementasikan *efficient trade matrix* di antara lima negara ASEAN yang terpilih, dan juga penyelesaian transaksinya menggunakan persyaratan cadangan emas melalui *Multi-Bilateral Payments Arrangement* (MBPA).

Metode – Penelitian ini adalah penelitian kualitatif dengan analisis deskriptif. Tujuan dari penelitian kualitatif-deskriptif adalah untuk mensimulasikan penerapan emas dalam *Multi-Bilateral Payment Arrangement* di antara negara-negara ASEAN menggunakan data perdagangan.

Hasil – Penelitian ini berargumen bahwa negara-negara Asia Tenggara dapat menyelesaikan permasalahan melalui koordinasi internal, terutama di bidang perdagangan. Salah satu upayanya adalah mengurangi atau bahkan menghilangkan risiko pasar dengan menggunakan perjanjian pembayaran yang efisien.

Kesimpulan – Penelitian ini berkesimpulan bahwa jumlah kuantitas emas yang dibutuhkan untuk menyelesaikan neraca perdagangan akan dikurangi dari *early gross payment*. Meski demikian, negara-negara ASEAN mesti memperkuat kerjasama di antara mereka melalui maksimalisasi hubungan perdagangan.

Kata Kunci: Krisis ASIA, Efficient Trade Matrix, Persyaratan Cadangan Emas, Commodity Trade, ASEAN

1. Introduction

Gold dinar, one of the currencies that is still keeping the intrinsic value. Dinar refers to gold coins used as a medium of exchange by the Muslims from the beginning of *Khulafa Rashidin* until the end of the Ottoman Caliphate (Lee, 2011). This medium of exchange can prevent society from various crises, for instance ASEAN financial crisis in 1997. The series of currency devaluation hit Southeast Asia in 1997. This led to several protectionist regulations to ensure the stability of national currency. Generally speaking, the reason why most of the countries suffered is, that the US Dollar, which originally is unstable currency, hikes dramatically in 1997. Therefore, based on history, using gold dinar as a stable medium of exchange in order to prevent fluctuation in currency is desirable.

The Southeast Asia has been one among the fastest growing economies in the world, since 14 years after millennium. The Southeast Asian countries that comprise this dynamic region represent a developing trade and center of economic, despite its infrastructure and regulatory challenges. The countries have average growth rate of more than five percent per year over the past decade. If all these Southeast Asia countries were merged into one country, it would be the world's ninth-largest economy. It would also be the most trade-dependent, with an excess of 150 percent trade-to-GDP ratio (Brown, 2013). Nowadays, Southeast Asia has become one of the top destination for trading and investment especially during the recession in US and several of European countries around 2008.

However, the 1998 financial crisis in Southeast Asia will still be endured in mind. The Southeast Asian crisis guide some financial reforms, specifically relates to currency trading and national accounts management. The most influenced countries hit by the crisis are Indonesia and Thailand that try to recover by borrowing money from IMF. They created a series of bailouts ("rescue packages") for the most-affected economies to enable affected nations to avoid default, tying the packages to currency, banking and financial system reforms which include increased interest rates. Unlike the other countries, Malaysia prefer to far away from IMF and World Bank, to avoid raising the interest rate. Malaysia keep fixed exchange rate and disallow the currency traders from accessing the ringgit. These strategies were done by their Prime Minister Dr. Mahatir Mohamad, brought Malaysia to recover faster than the rest. He mentioned in financial times that a new "Bretton Woods" should be convened with adequate representation from the poor countries. It should consider a trading currency based on gold, against which all other currencies should be valued. The fluctuation of the price of gold would be minimal. Business would be exposed to less uncertainty. Governments should fix the

exchange rate based on gold or economic performances. There should be no trading in currencies. (Mohamad, 2012)

Almost in two decades after ASEAN crisis, ASEAN build mechanism to prevent the crisis hit them again since 1 December 1997. ASEAN goals in that time are to decide to transform ASEAN into a stable, prosperous, and highly competitive region with equitable economic development, and reduced poverty and socio-economic disparities (ASEAN Vision 2020) (ASEAN, 2008). Is it gold still possible to resolve the problem in order to achieve ASEAN vision 2020. Several summits have been done by leaders in ASEAN countries afterwards. The Leaders affirmed their strong commitment to accelerate the establishment of an ASEAN Community by 2015 as envisioned in the ASEAN Vision 2020. The leaders believed the importance of external trade to ASEAN and the need for the ASEAN Community as a whole to remained outward looking and eliminating several market barriers, so that ASEAN Vision 2020 can be achieved. The AEC envisages the following key characteristics: (a) a single market and production base, (b) a highly competitive economic region, (c) a region of equitable economic development, and (d) a region fully integrated into the global economy. These characteristics are inter-related and mutually reinforcing. Incorporating the required elements of each characteristic in one Blueprint shall ensure the consistency and coherence of these elements as well as their implementation and proper coordination among relevant stakeholders. (ASEAN, 2008)

Presently, ASEAN just have one year remaining to complete their strategy into ASEAN Economic Community in 2015. However, no one can ensure after key characteristics already settle, ASEAN will free from financial crisis that hit them heavily in 1997. Realizing most of member countries trade with US dollar as their trading currency, additionally several developed country invest their foreign reserve in ASEAN countries, this can bring them into financial crisis again due to instability mechanism. Consequently, ASEAN countries have to promote free trade mechanism with more stable currency.

In 2003, a statement by Dr. Mahatir Mohamad, prime minister of Malaysia in that time to utilize gold dinar as medium of exchange in Bilateral Payment Arrangement (BPA) with Iran. However, nothing has happened, Iran has not engaged in settlement of bilateral trade with Malaysia using gold dinar. Besides, the gulf countries, have withdrawn their gold dinar and started more discuss diversification into the Euro due to political interest. Political interest still one of the big issue of causality stagnant gold dinar as medium of exchange. The other fear of using gold dinar as medium of exchange is incapable of gold dinar to face with completely

commoditized societies in nowadays financial mechanism. (Woertz, 2006). It is always wise to implement changes gradually in order to build strong basic for the new financial mechanism of gold dinar as medium of exchange. With small changes, one may be able to monitor the impact of the changes and take necessary action where needed. (Meera & Larbani, 2004)

This paper analyses ASEAN countries trade behavior assuming gold is used as medium of exchange to settle the free trade between the countries. The objective is to determine the efficient trade matrix and level of gold required to support their commodity trade.

The specific objectives of this study therefore:

1. To analyze the efficient trade can be happened among ASEAN countries through its Multi-Bilateral Payment Arrangement (MBPA) as they start to implement ASEAN Economics Community (AEC) by the end of 2015
2. To simply simulate the implementation of trade using the gold requirement based on the commodities commonly contributed among these participated countries (Malaysia, Indonesia, Singapore, Thailand, and The Philippines) from the United Nation Comtrade database (UNCOMTRADE).

2. Methodology

2.1. Data and Analysis

The study is a qualitative research with analytic description. The purpose of this qualitative-descriptive study is to simulate the implementation of gold in the Multi-Bilateral Payment Arrangement among ASEAN countries using the current trade data. Hence, the intra-trade commodity data of 2012 for selected ASEAN (Association of Southeast Asian Nations) countries is mainly used for this study. Five ASEAN countries and five major primary commodities of these countries were used in our analysis to form a five-by-five matrix. The five countries were selected as they are the founding fathers of this association and have the major contributions to the ASEAN economy. The selected countries are: Indonesia, Malaysia, Philippines, Singapore and Thailand. The five commodities are derived from Meera & Aziz (2002) and Bashir (2012) and also commonly used between these countries. The products include: Palm oil, crude; Rice; Wheat; Crude petroleum; Meat, beef. These products are choosing base on their importance to ASEAN countries, either in term of production and consumption.

The United Nations Commodity Trade (UNCOMTRADE) data served as the main source of data used in this study. This database reports disaggregated data to six digits. Annual intra trade

commodity data for the year 2012 of the five selected ASEAN countries based on the United Nation COMTRADE SITC Revision 3 classification was used. According to (Bashir, 2012) this is because, of all the four classification under UNCOMTRADE, this classification is the one recommended for economic analysis by the provider, recommended by World Trade Organization, World Bank.

Table 1 Selected Commodities

No.	Commodity Name	Code
1	Palm oil, crude	PALM_OIL/
2	Rice	RICE_5
3	Wheat	WHEAT_US_HRW
4	Crude petroleum	CRUDE_PETRO
5	Meat, beef	BEEF

Intra ASEAN trade, import and export, of the selected products among the chosen countries for the year 2012 were used throughout this analysis. To prove and answer the objective of this paper, we decided to do analysis only on Multi-Bilateral Payments Arrangement (MBPAs) by using Microsoft Office (Excel). The reason is as there were limitations to do a nonlinear optimization as Meera & Larbani (2004) and Bashir (2012) did in the prior research.

3. Results & Analysis

3.1 The Gold Function: Played the Role of Money in International Trade

Gold money was first used during the era of the Roman and the Persian and it was widespread extending into the land of the Arabs and was adopted by the Prophet Muhammad (peace be upon him). Dinar that refers to gold coins was used as a medium of exchange since the reign of *Khulafa Rashidun* until the end of the Ottoman Empire. Islamic gold dinar is a round gold coin weighing 4.25 grams and Dirham is silver coins weighing 2.975 grams. Nevertheless, gold dinar is referred as the only sharia-compliant currency for the Muslims.

The idea of using gold dinar as money has been proposed by many Muslim scholars. Social cycles study by Ibn Khaldun states that God created gold and silver as the measure of value for all things, and he emphasizes the importance of using these two metals for that purpose. Al-Maqrizi in his book *Ighatah*, Qudamah Ibn Jaafar in *Kharaj* and al-Ghazali have the same opinion that God created the two metals to circulate as a medium of exchange and measure of value (Sanusi, 2002:73-89). Significantly, the statement is supported by the recent study of Meera and Aziz (2002), as they explain the number of advantages that have been offered by Gold Dinar as follows:

1. Stable Money

The elimination of money creation/destruction is one of the biggest advantages of the gold dinar system. The gold dinar could play its role as a store of value much better than the fiat money does in an interest-based economy

2. Excellent Medium of Exchange

Since gold is priced and referred globally, it is always valued by people of all nations and creed. The gold dinar could easily play the role of a preferred global currency.

3. Minimizes Speculation, Manipulation and Arbitrage

The speculative and arbitrage activities that take place in the current system are possibly caused by the existence of different currencies and the cross exchange rates between them. With gold dinar acting like a single currency to eliminate all these exchange rates, speculation and arbitrage will not be possible. This would further strengthen and stabilize the economy.

4. Minimizes Business Cycle Effects

In the gold dinar system, each transaction is an exchange within the real sector with actual funds. Unlike the interest-based monetary system with intermediate credit (i.e., credit cards) and virtual transactions, the gold dinar system will create a harmonious relationship between the monetary and the real sector.

5. Dinar Promotes Trade

A single currency will facilitate trade among the participating countries, bringing them closer in line with the broad principles of *Ukhuwah* (brotherhood). By fostering closer ties among the Muslim nations, it will enforce closer relationship in trade and other forms of partnership.

In the gold payment system, gold is to be used as medium of exchange and as a unit of account, in place of the national or international reserve currencies, for settling international trade balances (Meera & Larbani, 2004). As for those functions, weights of gold used as the pricing the total exports and imports. As a function, it is worth to note that gold itself is only used for pricing and not as national currencies backed by gold. The central bank would play an important role in keeping the national trade accounts, and providing a secure place to hold gold. As for implementation in ASEAN countries trade, Malaysia and Indonesia for example, will only record the trade accounting and settle the net difference periodically; hence a physical gold movement between the countries is not necessary. This structure however eliminates exchange rate risks and speculation risk as in forward, futures and options markets. If participating countries agree to use the gold dinar payment system, it is much as if the three currencies

become a single currency. Accordingly, speculation and arbitrage among the currencies will be reduced or even eliminated, thus contributing to greater economic efficiency and increasing real financial inclusion among countries.

3.2 Regional Trade Agreement

A trade agreement is classified as bilateral trade agreement (BTA) when it is signed between two countries. If the participating countries signed in the trade are more than two countries, it is classified as multilateral trade arrangements (MTA). Both agreements also called Bilateral Payment Arrangements (BPAs) and Multilateral Payment Arrangements (MPAs). Another types of trade agreement is Regional trade agreements (RTAs), RTAs is a multi-bilateral agreements with a specific objectives within the participating countries. It can be defined as groupings of countries that come together with the goal of reducing trade barrier among member countries. These groupings or union may be an arrangement between countries that do belong to the same geographical region.

According to Whalley (1998), the main reason which makes nations seek these arrangements is none other than the even mutual agreements taken to become more explicable. The most conventional objectives thought to underline a country's participation in the trade negotiation is the idea that through reciprocal exchanges of concessions on trade barriers there will be improvements in market access from which all parties to the negotiation will benefit. It is supported by the proposed idea by Yusuf et al. (2012), which state RTAs impact will lead to trade creation and trade division. The traditional theory of trade proposes that removal of trade barriers give consumer and producers opportunity to buy from the cheapest most competitive source of supply. This however will boost efficiency and promote welfare. Because of this, it was traditionally believed that regional trade blocks would create gains from trade due to member countries' decrease in trade barriers with one another.

A further objective for countries that adopt regional trade agreements is to increase their bargaining power with third countries by negotiating an agreement with common external barriers. RTAs are also used to provide access for the larger country market in the region and more security for the smaller country. To sum up, Whalley (1998) explains a final set of objectives that considers the advantages of RTAs and its purposes for the member countries to achieve their objectives.

3.3 Economic Integration among the ASEAN Countries: ASEAN Economic Community

The Association of Southeast Asian Nations, or ASEAN, was established in 1967 by the Founding Fathers of ASEAN, namely Indonesia, Malaysia, Philippines, Singapore and Thailand. Then Brunei Darussalam, Viet Nam, Laos PDR, Myanmar and Cambodia are joining along the way, making up what is today the ten member States of ASEAN. The ASEAN leaders at their summit in 1997 decided to transform ASEAN into a stable, prosperous and highly competitive region with equitable economic development, and reduced poverty and socio-economic disparities, later known as ASEAN vision 2020.

At the Bali summit in 2003, ASEAN leaders declared that the ASEAN Economic Community (AEC) shall be the goal of regional economic integration. The AEC, as espoused in the vision of 2020 is based on a convergence of interests of ASEAN Member countries to deepen and broaden economic integration through existing and new initiatives with clear timelines. AEC will establish ASEAN as a single market and production base making ASEAN more dynamic and competitive with new mechanisms and measures to strengthen the implementation of its existing economic activities; accelerating regional integration in the priority sectors; facilitating movement of business persons, skilled labor and talents; and strengthening the institutional mechanisms of ASEAN. Based on these and taking into considerations the importance of external trade to ASEAN and the need for ASEAN Community as a whole to remain outward looking, the AEC envisages the following key characteristics:

1. A single market and production base
This idea comprises five core elements: (a) free flow of goods; (b) free flow of services; (c) free flow of investment; (d) free flow of capital; and (e) free flow of skilled labor.
2. A highly competitive region
3. A region of equitable economic development
4. A region fully integrated to the global economy

ASEAN has ready to participate in regional trade arrangements, also preparing to compete globally. This will support the idea of Regional Trade Agreements in trade creation and trade division, the challenge is then how to implement this types of trade agreements using gold dinar.

3.4 Implementing the Gold Dinar in ASEAN Regional Trade Agreement

The trade agreement among the ASEAN countries has been conducted for many years before. It uses US dollar currencies in settling the trade, in which they have to manage foreign exchange risk to minimize its impacts to their national currency. The worst crisis faced by ASEAN member countries is when the 1997 East Asian financial crisis, The Malaysia, Thailand,

Singapore and Indonesia lost billions of dollars due to the collapse of their respective currencies. They were struggled and scrambled to save themselves from speculative attacks on their currencies. The use of gold in the transaction is the best solution to tackle this issues regarding fiat money. Mundell (2001) avers that the best path to international monetary reform is through a new international currency based on G3 monetary union possibly linked to gold.

Implementing gold dinar for settling international trade balances only replaces international reserve currencies, like dollars, with implications for the national currency. As mentioned in the study conducted by Meera and Larbani (2004), gold dinar in the trade settlement system need not exist in physical form. However, external trade needs to be denominated in dinar, i.e. a standard unit of weight of gold. All external trade transactions need the presence of central banks from respective countries to keep the trade accounts. Exporters will be paid in gold, or in their own national currencies, by their respective central banks on the due date of exports, based on the gold dinar exchange rate prevailing at the time of the transaction. Similarly, the importers will make payments to their respective central banks. The commercial banks are viable intermediaries, between the importers and exporters on one side and the central bank on the other.

Practical examples mentioned by Meera and Larbani (2004) is when countries involve in the trade, the gold accounting is kept through the medium of the central banks and only the net difference between the countries is settled periodically by the transfer of an equivalent amount of gold. Hence, every transaction, in essence, involves gold “movement”. Nonetheless, a physical transfer of gold from one country to another is not necessary, but only a transfer of beneficial ownership in gold custodian’s account. The custodian role can be played by reputable banks like the Islamic Development Bank (IDB), or the Bank of England or any others banks. The role of the custodian could be expected to decrease the default risk and, thereby, increase confidence in the system. However, as mentioned earlier, any gold that needs to be settled can always be brought forward for settling future transactions. Where it is not possible to transfer gold, payment can be made by way of an equivalent amount in other acceptable currencies, using the real-time gold price. Through this structure, gold would only play the role of a unit of account. Only the net balance remaining in the matrix of trade needs to be settled in gold. A smaller amount of gold through net settlement balance can settle a larger trade matrix in RTAs. Countries should aim for such efficient trade so that the system need not stock up large amounts of gold.

3.5 The Challenges in Implementing Multilateral Payment Arrangement (MPA) among ASEAN countries

There have always been challenges to implement the initiation of currency union though its benefits has been discussed by some empirical researches. The most discussed one is the significant increase in the trade integration which will benefit to all members. As Alberto Alesina (2002) shows the strong relationship between country and international trade through the 85% ratio of the number of currencies to the number of countries between 1947 and 2001. It is strengthen by Rose in Alberto Alesina (2002) that even a bilateral trade of the same currency will be different for 200% compared to the same currency countries. Others may vary from 100, 220, and 290% in the result of the currency union as concluded in Bacha (2008).

In the particular area of implementing in ASEAN countries, Bacha (2008) comprehensively discussed benefits which are shown below:

1. It will be beneficial for ASEAN countries so they will be able to reduce their emerging market risk premium.
2. Other than goods trade between countries, it will encourage more development of the regional financial markets integration.
3. It is however can decouple from being reluctant to the external currencies, in particular the US\$.

In addition, the common currency discussed in the case of ASEAN brings other advantages, not only minimizing exchange rate risk but also reducing transaction cost due to currency conversion. As for the trade, it will stimulate a faster growth, competitiveness and efficiency.

Gold however is proven as the best real money for many centuries since the Roman Byzantine up to the breakdown of Bretton Woods in 1971. Its characteristics has fulfilled the requirements of becoming good money; valuable for its own, homogenous, stable, durable, divisible, mobile, and play the role of a stable floating exchange rate system. As such, gold can be expected to significantly increase trade (Meera & Larbani, 2004).

Implementing the gold based as the common currency in international trade would be beneficial for ASEAN countries, as this idea proposed by one of the leaders, Dr Mahathir Mohamad. The main difference in the application is that in the bilateral and multilateral trade settlement systems, the gold dinar need not exist in its physical form.

The further detail is explained in Meera A. K (2004), the main play role will be the central banks of participating countries in the implementation of the gold dinar in the bilateral and

multilateral trade settlement mechanisms. All external trade transactions pass through the central banks that keep the trade accounts. Exporters and importers will do the transaction in their own national currencies based on the gold exchange rate on the time of transaction and get the payment on the agreed date. In the operationalization area, it is the commercial banks that support gold accounts through the accounts would take place in the implementation of the gold dinar with individual businessmen, corporations and traders. These commercial banks would, in turn, deal with the central bank for their respective gold accounts. Through the points of what have been discussed in those literature, the implementation of efficient trade can be happened among ASEAN countries particularly as they start to implement ASEAN Economics Community (AEC) by the end of 2015. A set of applied case is shown in the next topic to prove that this settlement may really occur in Multi-Bilateral Payment Arrangement (MBPAs)

3.6 The Simulation of Multi-Bilateral Payments Arrangement (MBPAs)

a. Conditions of the Multi-Bilateral

In the actual efficient trade matrix model by Meera & Larbani (2004) and Bashir (2012), needs and potentials of these countries need to be computed using non-linear programming as discussed under the theoretical frame work. Yet as we mentioned before, there are limitations to do so, we just display the amount of potential export and import in the participated countries. The 2012 price for product k was taken the World Bank primary commodity prices and converted to the gold equivalent in ounce for 2012 as shown in Table 2.

Table 2 Price of Commodity in US\$ and Gold

No.	Commodity Name	Price (in \$/unit)	Converted Price (in Gold/unit)	Source
1	Palm oil, crude	\$999.3/mt	0.60/mt	World Bank Commodity Price Data (nominal price)
2	Rice	\$544/mt	0.33/mt	
3	Wheat	\$304.3/mt	0.18/mt	
4	Crude petroleum	\$105.01/bbl	0.06/bbl	
5	Meat, beef	\$4,140/mt	2.48/mt	
Note : \$ = US Dolar ; mt = metric ton ; bbl = barrel ; kg = kilogram ; Gold (measured in toz, troy ounce of gold = \$1670/toz)				

The commodities' data was obtained from UNICOMTRADE, the price per unit of each of the commodity and the price of gold per ounce in dollar were obtained from the World Bank. We assume prices are fixed for the trading period. In table 1, the first column presents the serial number of the selected products; column 2, the products; column three shows their code according to UNICOMTRADE; column 4 the dollar prices and the last column show their corresponding gold prices.

Table 3 Potential Export in 2012

Countries Potentials (p)	Products (1000 ton)				
	Palm Oil, crude (mt)	Rice (mt)	Wheat (mt)	Crude Petroleum (bbl)	Meat (mt)
Indonesia (1)	7252.519	0.897176	0.044051	1785.405	0.000962
Malaysia (2)	4801.874	0.931329	3.991097	1427.371	3.438657
Singapore (3)	3.30961	109.8914	1.857251	0.003727	6.525063
Thailand (4)	218.4285	6734.427	0.005014	258.799	19.823713
Phillipines (5)	34.7598	3.934046	0.005128	100.6521	0.05237

Source: Author's Computation based on UNCOMTRADE data

Table 4 Import (Maximum quantity needed) in 2012

Countries Import max. (t)	Products (1000 ton)				
	Palm Oil, crude (mt)	Rice (mt)	Wheat (mt)	Crude Petroleum (bbl)	Meat (mt)
Indonesia (1)	-	1810.372	6250.49	1496.478	33.50644
Malaysia (2)	825.8028	1005.968	1028.637	1311.525	123.662
Singapore (3)	536.1833	1022.801	168.3941	5594.786	27.43691
Thailand (4)	-	357.8475	2581.987	5019.082	25.16432
Phillipines (5)	-	26.94922	2999.126	1057.087	85.09613

Source: Author's Computation based on UNCOMTRADE data

Table 3 shows the potential export of the selected products by the selected countries in 1000 tons of the designated weight. Palm oil, rise meat and wheat are measured in kilogram while crude petroleum is measured in barrel. The last row shows that Philippines exports 34.7598 thousand ton of palm oil crude; 3.934046 thousand ton rice; 0.005128 thousand ton of wheat; 100.6521 cubic barrels of crude petroleum and 0.05237 thousand ton meat.

Table 4 presents volume of imports for selected products for selected countries. Column one presents the countries with their serial numbers. The first row of the table shows that Indonesia imports 1810.372 thousand rice; 6250.49 thousand ton of wheat; 1496.478 cubic barrels of crude petroleum and 33.50644 thousand ton meat respectively.

b. The Results of the Multi-Bilateral Payments Arrangement (MBPAs)

As stated earlier, we simplify to get the settlement amount of the Multi-Bilateral Payments Arrangement (MBPAs). First step, we computed the payment due from one country to another and converted them to the gold equivalent in ounce for 2012. Then putting these in a matrix gives us the multi-bilateral setup as shown in Table 5. The total trade amount is **8,540,892.11** ounce of gold among the five countries. The table also provides each country with a target gold holding for the trading period, the payment is due from column to row. Column three shows that Singapore will pay Indonesia, Malaysia, Thailand and Phillipines the sum of 1,146,639.42 ounce of gold, 231,553.36 ounce of gold, 179,827.19 ounce of gold and 32,897.64 ounce of

gold respectively. The result of Meera and Larbani (2004), and (Yusuf et al., 2012) show as the quantity of gold needed to settle trade balances reduces from gross settlement to multi-bilateral to multilateral trade arrangement, confirming that cooperation pays. Meanwhile, in our study we only get the result of multi-bilateral trade arrangement (MBPAs).

Table 5 Result of the Multilateral Payments Arrangement in ounce of gold

Gold (toz)	Indonesia	Malaysia	Singapore	Thailand	Philippines	Export
Indonesia		499,765.26	1,146,639.42	795,351.01	11,325.47	2,453,081.16
Malaysia	930,861.91		231,553.36	1,109,348.59	170,890.38	2,442,654.25
Singapore	347,550.96	340,506.88		197,899.83	19,579.95	905,537.62
Thailand	899,994.69	1,363,715.76	179,827.19		24,363.97	2,467,901.61
Philippines	12,058.43	200,152.08	32,897.64	26,609.32		271,717.48
Import	2,190,466.00	2,404,139.98	1,590,917.62	2,129,208.74	226,159.76	8,540,892.11

Source: Author's Computation

Table 6 shows the import and export payment, in ounce of gold, due from each country. Indonesia export total amount 2,453,081.16 ounce of gold to the rest four countries and import total amount of 2,190,466.00 ounce of gold from the rest four countries, thus Indonesia need to receive 262,615 ounce of gold from other country. With a net payment of only 685,380 ounce of gold takes place a total trade of 8,540,892.11 ounce of gold among the 5 countries.

Table 6 Multilateral Payment Arrangement in Ounces of Gold

Gold (toz)	Export	Import	Net Settlement
Indonesia	2,453,081.16	2,190,466.00	262,615
Malaysia	2,442,654.25	2,404,139.98	38,514
Singapore	905,537.62	1,590,917.62	-685,380
Thailand	2,467,901.61	2,129,208.74	338,693
Philippines	271,717.48	226,159.76	45,558
Total	8,540,892.11	8,540,892.11	0

Source: Author's Computation

The net settlement due from country to country is presented in Table 7. A minimum ounce of gold 685,380 needed to settle whole trade with a simply way: Singapore pays Indonesia, Malaysia, Thailand and Philippines the amount of 262,615 ounce of gold, 38,514 ounce of gold, 338,693 ounce of gold and 45,558 ounce of gold respectively.

Table 7 Bilateral Payment Arrangement

Payment of The Country	Amount in Gold (toz)
Singapore pays Indonesia	262,615
Singapore pays Malaysia	38,514
Singapore pays Thailand	338,693
Singapore pays Philippines	45,558
Minimum Gold Needed	685,380

Source: Author's Computation

The main difference will be seen if we compare the net settlement in ounces of Gold and US dollar. The amount to be settled between these five ASEAN countries have to reach **\$1,144,584,610** as the reserve with the exchange risk involved.

Table 8 Multilateral Payment Arrangement in US\$

Gold (toz)	Export	Import	Net Settlement
Indonesia	4,096,645,529	3,658,078,222	438,567,307
Malaysia	4,079,232,594	4,014,913,768	64,318,826
Singapore	1,512,247,819	2,656,832,429	-1,144,584,610
Thailand	4,121,395,694	3,555,778,597	565,617,097
Philippines	453,768,184	377,686,804	76,081,380
Total	14,263,289,820	14,263,289,820	0

Source: Author's Computation

4. Conclusion

This study examined the net settlement that can be achieved between ASEAN five countries in trade agreement. The previous research by Meera & Larbani (2004) is a theoretical paper in mathematical model while Yusuf et al. (2012) enriched this study by analyzing an empirical study across five OIC countries. Among these are synchronous findings and similarity, it is also found in this study that the net settlement for five ASEAN countries and five major primary commodities of these countries in 2012 is decreasing. The results show that the amount of settlement reduces to 685,380 ounce of gold from the total payment of 8,540,892.11 ounce of gold with Multi-Bilateral Payments Arrangement (MBPAs).

In line with the previous studies, it can be concluded that using gold dinar system as common currency in RTAs, especially to settle larger trade matrix with the small amount of gold, is highly recommended. In further, the more beneficial will be attained as more countries apply this settlement. It can be obviously evident from the decreasing risk in emerging market premium and reluctant to US dollar.

This study has presented the possibility for ASEAN countries to consider gold as the efficient unit of measurement for intra-trade among them. However, the study has number of limitations: the major one is the lack of reliable and available data at the disaggregated level, the same problem with Yusuf et al., (2012). Other than that, we do not apply the nonlinear optimization solution for MBPAs as the prior research did. As for Multi-Bilateral Payments Arrangement (MPAs), a further study need to be conducted especially using the same method to find the minimum and maximum potential of their trade. At the same time, it will provide a further reduction for minimum gold amount required to settle the payment.

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