

# Hedging Foreign Exchange Risk with Forwards, Futures, Options and the Gold Dinar: A Comparison Note

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## Introduction

The 1997 East Asian currency crisis made apparent how vulnerable currencies can be. The speculative attacks on the Ringgit almost devastated the economy if not for the quick and bold counter actions taken by the Malaysian government, particularly in checking the offshore Ringgit transactions. It also became apparent the need for firms to manage foreign exchange risk. Many individuals, firms and businesses found themselves helpless in the wake of drastic exchange rate movements. Malaysia being among the most open countries in the world in terms of international trade reflects the degree of Malaysia's exposure to foreign exchange risk<sup>1</sup>. Foreign exchange risk refers to the risk faced due to fluctuating exchange rates. For example, a Malaysian trader who exports palm oil to India for future payments in Rupees is faced with the risk of Rupees depreciating against the Ringgit when the payment is made. This is because if Rupee depreciates, a lesser amount of Ringgit will be received when the Rupees are exchanged for Ringgit. Therefore, what originally seemed a profitable venture could turn out to be a loss due to exchange rate fluctuations. Such risks are quite common in international trade and finance. A significant number of international investment, trade and finance dealings are shelved due to the unwillingness of parties concerned to bear foreign exchange risk. Hence it is imperative for businesses to manage this foreign exchange risk so that they may concentrate on what they are good at and eliminate or minimize a risk that is not their trade. Elsewhere traditionally, the forward rates, currency futures and options have been used for this purpose. The futures and options markets are also known as **derivative** markets. However, in many nations including Malaysia futures and options on currencies are not available. The Malaysian Derivatives Exchange (MDEX) makes available a number of derivative instruments – Kuala Lumpur Composite Index Futures, Index Options, Crude Palm Oil Futures and KLIBOR

(interest rate) Futures – but not Ringgit futures or options. Even in countries where such derivative markets exist however, not all derivatives on all currencies are traded. In the Philadelphia Stock Exchange in the United States for example, derivatives are available only on select major world currencies. While the existence of these markets assists in risk management, speculation and arbitrage also thrive in them, both in the spot and derivative markets. This article compares and contrasts the use of derivatives – forwards, futures and options – and the **gold dinar** for hedging foreign exchange risk. It argues how a gold dinar system is likely to introduce efficiency into the market while reducing the cost of hedging foreign exchange risk, compared with the use of the derivatives.

### **Hedging with Forwards**

Hedging refers to managing risk to an extent that makes it bearable. In international trade and dealings foreign exchange play an important role. Fluctuations in the foreign exchange rate can have significant impact on business decisions and outcomes. Many international trade and business dealings are shelved or become unworthy due to significant exchange rate risk embedded in them. Historically, the foremost instrument used for exchange rate risk management is the forward contract. Forward contracts are customized agreements between two parties to fix the exchange rate for a future transaction. This simple arrangement would easily eliminate exchange rate risk, but it has some shortcomings, particularly getting a counter party who would agree to fix the future rate for the amount and time period in question may not be easy. In Malaysia many businesses are not even aware that some banks do provide forward rate arrangements as a service to their customers. By entering into a forward rate agreement with a bank, the businessman simply transfers the risk to the bank, which will now have to bear this risk. Of course the bank in turn may have to do some kind of arrangement to manage this risk. Forward contracts are somewhat less familiar, probably because there exists no formal trading facilities, building or even regulating body.

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<sup>1</sup> The Economist magazine's *Pocket World in Figures* (2002 Edition) ranks Malaysia the second most trade dependent country in the world. Trade as a percentage of GDP is 92 percent for Malaysia, even higher than that for Singapore, which ranks third with a percentage of 78.8 percent. See page 32.

### **An Example of Hedging Using Forward Agreement**

Assume that a Malaysian construction company, Bumiways just won a contract to build a stretch of road in India. The contract is signed for 10,000,000 Rupees and would be paid for after the completion of the work. This amount is consistent with Bumiways minimum revenue of RM1,000,000 at the exchange rate of RM0.10 per Rupee. However, since the exchange rate could fluctuate and end with a possible **depreciation** of Rupees, Bumiways enters into a forward agreement with First State Bank of India to fix the exchange rate at RM0.10 per Rupee. The forward contract is a **legal agreement**, and therefore constitutes an **obligation** on both sides. The First State Bank may have to find a counter party for this transaction – either a party who wants to hedge against the **appreciation** of 10,000,000 Rupees expiring at the same time or a party that wishes to speculate on an upward trend in Rupees. If the bank itself plays the counter party, then the risk would be borne by the bank itself. The existence of **speculators** may be necessary to play the counter party position. By entering into a forward contract Bumiways is guaranteed of an exchange rate of RM0.10 per Rupee in the future irrespective of what happens to the spot Rupee exchange rate. If Rupee were to actually depreciate, Bumiways would be protected. However, if it were to appreciate, then Bumiways would have to **forego this favourable movement** and hence bear some implied losses. Even though this favourable movement is still a potential loss, Bumiways proceeds with the hedging since it knows an exchange rate of RM0.10 per Rupee is consistent with a profitable venture.

### **Hedging with Futures**

Noting the shortcomings of the forward market, particularly the need and the difficulty in finding a counter party, the futures market came into existence. The futures market basically solves some of the shortcomings of the forward market. A currency futures contract is an agreement between two parties – a buyer and a seller – to buy or sell a particular currency at a future date, at a particular exchange rate that is fixed or agreed upon today. This sounds a lot like the forward contract. In fact the futures contract is similar to the forward contract but is much more liquid. It is liquid because it is traded in an organized exchange– the futures market (just like the stock market). Futures contracts are standardized contracts and thus are bought and sold

just like shares in the stock market. The futures contract is also a **legal contract** just like the forward, but the obligation can be ‘removed’ before the expiry of the contract by making an opposite transaction. As for hedging with futures, if the risk is an appreciation of value one needs to buy futures and if the risk is depreciation then one needs to sell futures. Consider our earlier example, instead of forwards, Bumiways could have thus sold Rupee futures to hedge against Rupee depreciation. Let’s assume accordingly that Bumiways sold Rupee futures at the rate RM0.10 per Rupee. Hence the size of the contract is RM1,000,000. Now say that Rupee depreciates to RM0.07 per Rupee – the very thing Bumiways was afraid of. Bumiways would then close the futures contract by buying back the contract at this new rate. Note that in essence Bumiways basically bought the contract for RM0.07 and sold it for RM0.10. This would give a futures profit of RM300,000  $[(RM0.10 - RM0.07) \times 10,000,000]$ . However in the spot market Bumiways gets only RM700,000 when it exchanges the 10,000,000 Rupees contract value at RM0.07. The total cash flow however, is RM1,000,000 (RM700,000 from spot and RM300,000 profit from futures). With perfect hedging the cash flow would be RM1 million no matter what happens to the exchange rate in the spot market. One advantage of using futures for hedging is that Bumiways can release itself from the futures obligation by buying back the contract anytime before the expiry of the contract. To enter into a futures contract a trader needs to pay a deposit (called an **initial margin**) first. Then his position will be tracked on a daily basis so much so that whenever his account makes a loss for the day, the trader would receive a margin call (also known as **variation margin**), i.e. requiring him to pay up the losses.

### **Standardized Features of the Futures Contract and Liquidity**

Contrary to the forward contract, the futures contract has a number of features that has been standardized. These standard features are necessary in order to increase the liquidity in the market, i.e. the number of matching transactions. In the practical world traders are faced with diverse conditions that need diverse actions (like the need to hedge different amounts of currency at different points of time in the future) such that matching transactions may be difficult to find. By standardizing the contract size (i.e. the amount) and the futures maturity, these different needs can be matched to some degree even though perhaps not perfectly. Some of the standardized features include expiry date, contract month, contract size, position limits (i.e. the number of

contracts a party can buy or sell) and price limit (i.e. the maximum daily price movements). These standardized features introduce some hedging imperfections though. In our example, if the size of each Rupee futures contract is 2,000,000 then 5 contracts need to be sold. However, if the size of each contract is 3,000,000 for instance, then only 3 contracts can be sold, leaving 1,000,000 Rupees unhedged. Therefore, with standardization, some part of the spot position can go unhedged. Some advantages and disadvantages of hedging using futures are summarized below:

### **Advantages**

- **Liquid and central market.** Since futures contracts are traded on a central market, this increases the liquidity. There are many market participants and one may easily buy or sell futures. The problem of double coincidence of wants that could exist in the forward market is easily solved. A trader who has taken a position in the futures market can easily make an opposite transaction and close his or her position. Such easy exit is not a feature of the forward market though.
- **Leverage.** This feature is brought about by the margin system, where a trader takes on a large position with only a small initial deposit. If the futures contract with a value of RM1,000,000 has an initial margin of RM100,000 then a one percent change in the futures price (i.e. RM10,000) would bring about a 10 percent change relative to the trader's initial outlay. This amplification of profit (or losses) is called leverage. Leverage allows the trader to hedge big amounts with much smaller outlays.
- **Position can be easily closed out.** As mentioned earlier, any position taken in the futures market can be easily closed-out by making an opposite transaction. If a trader had sold 5 Rupee futures contracts expiring in December, then the trader could close that position by buying 5 December Rupee futures. In hedging, such closing-out of position is done close to the expected physical spot transaction. Profits or losses from futures would offset losses or profits from the spot transaction. Such offsetting may not be perfect though due to the imperfections brought about by the standardized features of the futures contract.
- **Convergence.** As the futures contract approach expiration, the futures price and spot price would tend to converge. On the day of expiration both prices must be equal. Convergence is brought about by the activities of arbitrageurs who would

move in to profit if they observe price disparity between the futures and the spot; buying in the cheaper market and selling the higher priced one.

### **Disadvantages**

- **Legal obligation.** The futures contract, just like the forward contract, is a legal obligation. Being a legal obligation it can sometimes be a problem to the business community. For example, if hedging is done through futures for a project that is still in the bidding process, the futures position can turn into a speculative position in the event the bidding turns out not successful.
- **Standardized features.** As mentioned earlier, since futures contracts have standardized features with respect to some characteristics like contract size, expiry date etc., perfect hedging may be impossible. Since overhedging is also generally not advisable, some part of the spot transactions will have to go **unhedged**.
- **Initial and daily variation margins.** This is a unique feature of the futures contract. A trader who wishes to take a position in the futures market must first pay an initial margin or deposit. This deposit will be returned when the trader closes his or her position. As mentioned earlier, futures contracts are marked to market – meaning to say that the futures position is tracked on a daily basis - and the trader would be required to pay up daily variation margins in the event of daily losses. The initial and daily variation margins can cause significant cash flow burden on traders or hedgers.
- **Forego favourable movements.** In hedging using futures, any losses or profits in the spot transaction would be offset by profits or losses from the futures transaction. As in our earlier example, Bumiways sold Rupee futures in an anticipation of a Rupee depreciation. However, if Rupee were to appreciate, then Bumiways will have to forego such favourable movements.

The above shortcomings of futures contracts, particularly it being a legal obligation, with margin requirements and the need to forego favourable movements prompted the development and establishment of a more flexible instrument, i.e. the option contracts and option markets.

## Hedging using Options

A currency option may be defined as a contract between two parties – a buyer and a seller - whereby the buyer of the option has the **right but not the obligation**, to buy or sell a specified currency at a specified exchange rate, at or before a specified date, from the seller of the option. While the buyer of option enjoys a right but not obligation, the seller of the option nevertheless has an obligation in the event the buyer exercises the given right. There are two types of options:

- **Call options** – gives the buyer the **right to buy** a specified currency at a specified exchange rate, at or before a specified date.
- **Put options** – gives the buyer the **right to sell** a specified currency at a specified exchange rate, at or before a specified date.

Of course the seller of the option needs to be compensated for giving such a right. The compensation is called the price or the **premium** of the option. Since the seller of the option is being compensated with the premium for giving the right, the seller thus has an obligation in the event the right is exercised by the buyer.

For example assume a trader buys a September RM0.10 Rupee call option for RM0.01. This means that the trader has the right to buy Rupees for RM0.10 per Rupee anytime till the contract expires in September. The trader pays a **premium** of RM0.01 for this right. The RM0.10 is called the **strike price** or the **exercise price**. If the Rupee appreciates over RM0.10 anytime before expiry, then the trader may exercise his right and buy it for RM0.10 per Rupee. If however Rupee were to depreciate below RM0.10 then the trader may just let the contract expire without taking any action since he is not obligated to buy it at RM0.10. If he needs physical Rupee, then he may just buy it in the spot market at the new lower rate.

In hedging using options, calls are used if the risk is an upward trend in price and puts are used if the risk is a downward trend in price. In our Bumiways example, since the risk is a depreciation of Rupees, Bumiways would need to buy put options on Rupees. If Rupees were to actually depreciate by the time Bumiways receives its Rupee

revenue then Bumiways would exercise its right and exchange its Rupees at the higher exercise rate. If however Rupees were to appreciate instead, Bumiways would just let the contract expire and exchange its Rupees in the spot market for the higher exchange rate. Therefore the options market allows traders to enjoy unlimited favourable movements while limiting losses. This feature is unique to options, unlike the forward or futures contracts where the trader has to forego favourable movements and there is also no limit to losses.

Options are particularly suited as a hedging tool for contingent cash flows, for example like in bidding processes. When a firm bids for a project overseas, which involves foreign exchange risk, it may quote its bidding price and at the same time protect itself from foreign exchange risk by buying put options. If the bidding was successful, the firm will be protected from a depreciation of the foreign currency. However, if the bidding was unsuccessful and the currency appreciated, then the firm may just let the contract expire. In this case the firm loses the premium paid, which is the maximum loss possible with options. If the bidding was unsuccessful and the currency depreciated, the firm may exercise its right and make some profits from this favourable movement. In the case of hedging with forward or futures, the firm would be automatically placed in a speculative position in the event of an unsuccessful bid, without a limit to its downside losses.

### **An Example of Hedging with Put Options**

Consider our Bumiways example. Instead of having already won the contract to build the road in India, lets however assume that it is in the process of bidding for the contract, as is common in real-life. Bumiways wants a minimum acceptable revenue of RM1,000,000 after hedging costs, but Bumiways need to quote a bid price now. In this instance, Bumiways would only face the exchange rate risk contingent upon winning the bid. Due to this contingency, options fare a better hedging tool compared with forwards or futures. Assume it is now July and the results of the bidding will be known in September. The following September options quotes are available today:

RM0.10 call @ RM0.002

RM0.10 put @ RM0.001



The size of each Rupee contract is 2,000,000 Rupees.

The following is how Bumiways would make its hedging strategy:

1. Buy puts or calls? Since the Bumiways would receive Rupees in the future if it won the contract, its risk is a depreciation of Rupees. Therefore, it should **buy puts**.
2. What should be the bid amount? To answer this question we need to compute the effective exchange rate after incorporating the premium, i.e. RM0.10 minus RM0.001 which equals RM0.099. Now the bid amount is computed as  $RM1,000,000/RM0.099$ , which equals 10,101,010 Rupees.
3. How many put contracts should it buy to protect against the depreciation in Rupees? To answer this, just take the bid amount and divide by the contract size, i.e.  $10,101,010/2,000,000$  equals 5.05. Since fractions of contracts are not allowed and we don't overhedge, 5 contracts are sufficient with some portion being unhedged. However, to guarantee a minimum revenue of RM1,000,000 we cannot tolerate imperfections in hedging. Therefore in this example we should go for 6 contracts.
4. What is the cost of hedging? Cost of hedging is computed as follows: 6 contracts x 2,000,000 per contract x RM0.001 equals RM12,000. This cost of hedging is the maximum loss possible with options.

In September, Bumiways would have known the outcome of the bid. By then also the Rupee might have appreciated or depreciated. Lets assume the Rupees either appreciates to RM0.20 or depreciates to RM0.05 per Rupee. The following are the four outcomes possible and their cash flow implications.

**Possible Cash Flow Outcomes of Hedging using Options**

	<b>Rupee Depreciates to RM0.05</b>	<b>Rupee Appreciates to RM0.20</b>
<b>Bid Won</b>	Exchange the 10,101,010 Rupees @RM0.05 = RM505,050.50 Plus profit from options 6 x 2,000,000 x (RM0.10-RM0.05) = RM600,000 Less cost of hedging = RM12,000 Net Cash flow = RM1,093,050 (which guarantees the minimum revenue of RM1,000,000)	Exchange the 10,101,010 Rupees @RM0.20 = RM2,020,202 Puts options not worth exercising, therefore let them just expire. Less cost of hedging = RM12,000 Net Cash flow = RM2,008,202 (In this case the option allows Bumiways to enjoy a favourable movement)
<b>Bid Lost</b>	In this case Bumiways would not receive the bid amount. But however it could still exercise its rights and realize its profit from puts. Profit from options 6 x 2,000,000 x RM0.05 = RM600,000 Less cost of hedging = RM12,000 Net Cash flow = RM578,000	This is the worst case that can happen. Bid lost and also the put option position ends up being not profitable. Bumiways loses the premium paid = RM12,000. This is the maximum loss possible.

The above example illustrates how options can be used to guarantee a minimum cash flow on contingent claims. In case the bid is won, a minimum cash flow of RM1,000,000 is guaranteed while allowing one to still enjoy a favourable movement if it does take place. If the bid is lost, the maximum loss possible is the premium paid.

An example for the use of call option for hedging is like when a firm bids to buy a property (eg. land) in another country. Say Palmco Sdn Bhd bids to buy a land in Indonesia to plant oil palm trees. The bidding is in Indonesian Rupiah. Here the risk would be an appreciation of Rupiah. Therefore accordingly, buying call options on Rupiah would be the suitable hedging strategy.

The options market is simply an **organized insurance market**. One pays a premium to protect oneself from potential losses while allowing one to enjoy potential benefits. For example when one buys a car insurance, one pays its premium. If the car gets into an accident one gets compensated by the insurance company for the losses incurred. However if no accident happens, one loses the premium paid. If no accident happens but the car value appreciates in the second hand market, then one gets to enjoy the upward trend in price. An options market plays a similar role. In the case of options however the seller of a option plays the role of the insurance company.

### **Advantages and Disadvantages of Hedging using Options**

The advantages of options over forwards and futures are basically the limited downside risk and the flexibility and variety of strategies possible. Also in options there is neither initial margin nor daily variation margin since the position is not marked to market. This could potentially provide significant cash flow relief to traders.

Because options are much more flexible compared to forwards or futures, they are thus more expensive. The price is therefore a disadvantage.

### **The Gold Dinar**

Some readers by now would have realized that my examples of Rupees and Rupiah futures and options are hypothetical. There are no such derivatives traded on any organized exchange. But that is precisely a point we would like to highlight. Currently derivatives are traded only in select major world currencies like the Yen, Pound, Australian dollar etc. against the US dollar mostly. For most other currencies of the world including almost all of developing nations' there are no formal tools for hedging against foreign exchange risk. Malaysia, Thailand, Indonesia, Philippines, India etc. are no exception to this.

Recently, the Prime Minister of Malaysia Dr. Mahathir Mohamad had called on such countries to formulate a gold payment system – the gold dinar – to settle their bilateral and multilateral trades among them and thereby also hedge against foreign exchange risk. In this mode, gold is used as a medium of exchange instead of national currencies. Price of exports and imports are to be quoted in weights of gold. It is important that in this structure that gold itself is used for pricing and not national currencies backed by gold, for otherwise it would not be different from the gold standard of the past. Instruments backed by gold are subject to easy manipulation that caused the failure of the gold standard.

### **Hedging using Gold Dinar**

In this mode, the central bank would play an important role of keeping national trade accounts and a place to safe-keep gold. When Malaysia trades with Indonesia for example, the gold accounting is kept through the medium of central bank and only the net difference between the two is settled periodically. Hence every transaction in essence involves gold movement. However since bilateral and multilateral trades are ongoing processes, any gold that needs to be settled can always be brought forward and used for future transactions and settlements. On the ground, commercial banks that support gold accounts seem a viable partner in the implementation of the gold dinar. International trade participants - individuals, businessmen, corporations and traders - would deal with commercial banks that provide such gold accounts. These commercial banks would in turn deal with the central bank for their respective gold accounts. This model is shown in Diagram 1.

As an example, consider that Malaysia exports 100 billion gold worth of goods and services to Indonesia while importing 80 billion worth of goods and services. Hence Malaysia has a surplus trade of 20 billion. Indonesia needs to settle only this difference of 20 billion. However, this amount could be used for settling future trade imbalances between the countries and hence a physical gold movement between the countries is not necessary. This simple structure completely eliminates exchange rate risk. Even though international gold price may fluctuate, the participants realize that they have something that has intrinsic value that can be used for stable and continuous trade into the future. Therefore, even though with the existence of other national

currencies, speculation and arbitrage on gold price could tempt a participating country to redeem or sell its gold, it should resist such temptation for the sake stability of future trades. At this juncture, one may ask the question, how does this structure differ from a simple barter trade between the countries? The advantage is that gold acts as unit of account and this eliminates problems associated with barter.

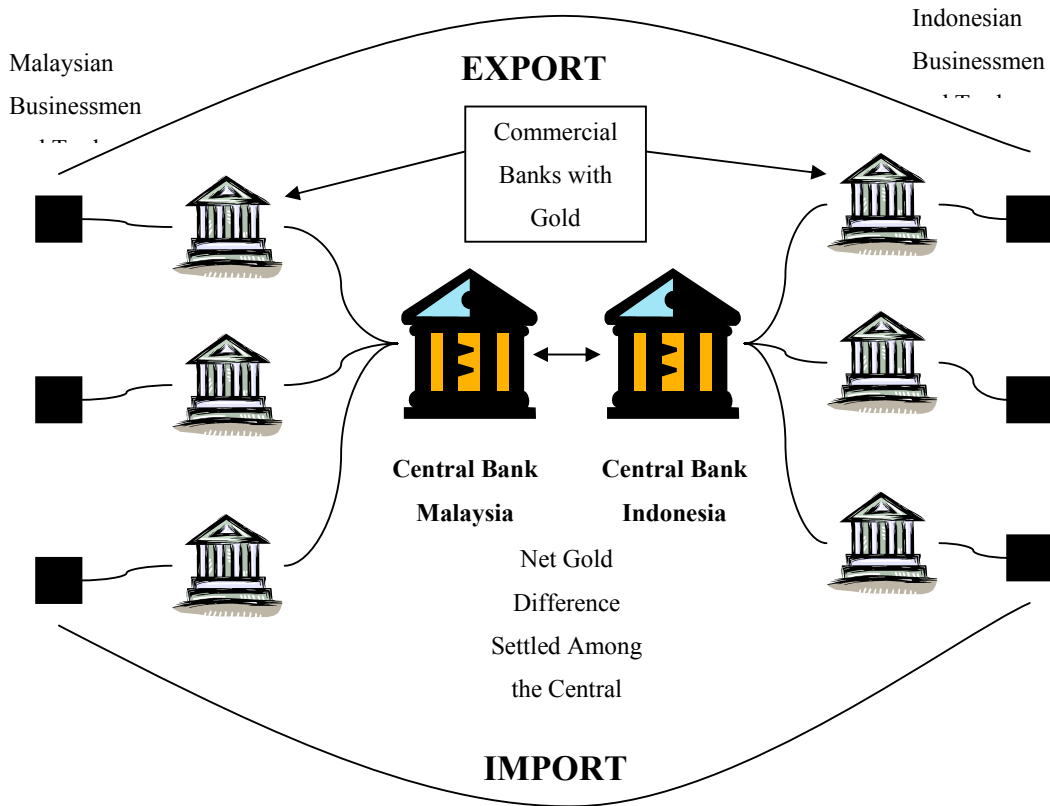
This simple gold payment system has numerous advantages:

1. Foreign exchange risk is totally eliminated. This means there is no need for forward, futures or options on the currencies of the participating countries. Here the hedging cost is fixed against gold, but note that even if hedging is done to fix the cash flow in any currency there is still risk in the fluctuation of that currency. Gold is superior here because it has intrinsic value.
2. Reduced currency speculation and arbitrage between the currencies. For example, if three countries agree to use the gold payment system, then it is akin that the three currencies become a single currency. Then speculation and arbitrage among these three currencies will be very much reduced. This unification of the three currencies through the gold dinar provides diversification benefits. It is like obtaining diversification through a portfolio of stocks. Individual currencies face risks that are unique to the issuer country. For example a political turmoil can cause a national currency to depreciate. But in a unified currency such unique risks would be diversified away. In fact, since people of all race, creed and nationality treasure gold, gold is a global currency that enjoys global diversification. This means no single country's unique risk may be significantly embedded in gold.
3. Low transaction costs since only accounting records need to be kept. Transactions can be executed by means of electronic medium for which some commissions are charged. The cost of such electronic transactions is generally low. Hence for international trades in this system, one no longer needs to open a Letter of Credit (LC) with a bank, incur exchange rate transaction costs or even face exchange rate risk.

4. The gold dinar reduces the need to create a significant amount of national currencies through the banking sector. This therefore highly reduces the possibility of future attacks on the Ringgit like the one in 1997.
5. Since the gold accounts are kept internally through commercial banks and central bank, transactions costs would not incur a gold outflow from the country.

The cost and benefits of using forwards, futures, options and the gold dinar for hedging foreign exchange risk are summarized in Table 1.

**Diagram 1**  
**The Gold Dinar Model for International Trade**



**Table 1**  
**Forwards, Futures, Options and Gold Dinar as Tools for Managing Foreign**  
**Exchange Risk: A Comparison**

	<b>Forwards</b>	<b>Futures</b>	<b>Options</b>	<b>Gold Dinar</b>
	<b>Costs</b>			
Initial Margin/Deposit	No	Yes	No	No
Variation Margin	No	Yes	No	No
Need for Speculators to assume the risks that hedgers seek to avoid	No	Yes	Yes	No
Forego favourable movements	Yes	Yes	No	Yes
Speculation	Yes	Yes	Yes	No. Both parties have real spot transactions
Arbitrage	Yes	Yes	Yes	No
“Barter” problems	Yes	No	No	No
Transaction Cost/Brokerage fee	Yes	Yes	Yes	Yes
	<b>Benefits</b>			
Diversification benefits	No	No	No	Yes
Liquid market	No	Yes	Yes	No
Can hedge any currency	Yes. Counter party may be difficult to find	No	No	Yes
Legal obligation	Yes	Yes	No	Yes

In my opinion, the gold dinar if implemented is akin to the forward contract but with its problems of **“barter”, speculative and arbitrage elements removed**; and is also



a superior tool for managing foreign exchange risk compared to the futures and options contracts.

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