Currency Forward Market, Hedging Behavior and Currency Speculation

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Activities in Currency Market

- Spot contract
  - *A contract for the immediate exchange of one currency for another.*
  - *The rate of exchange in the contract is known as 'spot rate'.*
  - *Individuals can buy and sell foreign currency through ' a retail channel' (such as bank);*
    - *(customers) buy (from banks) at the higher price than the midrange quote*
    - *(customers) sell (from banks) at the lower rate.*
    - *Difference between buy and sell rate is called 'spread'.*
    - *The fee and commissions go to the middlemen.*

- Forward Contracts:
  - Commit to a transaction but before payment is made at a agreeable exchange rate and duration.
  - Main purpose is to protect themselves against a change in the exchange rate.
  - The agreeable exchange rate is known as forward rate.
  - When forward rate is higher (lower) than its corresponding spot rate, it is referred to forward premium (discount).

- Currency Future :
  - A promise that the two parties holding the contract that will deliver currencies to each other at some future date at a pre-specified exchange rate.
  - It is traded on an organized market like Stock Exchange of Thailand *(Different from Forward Contract which is basically customers and banks)*.
  - In Thailand, there is no Currency Future.

- Currency Swap
  - A combination of a spot sale of foreign currency with a forward repurchase of the same currency (reduce transaction costs of separating activity)
  - Consider the situation; there are baht currency in Offshore market. This makes central bank difficult to pursue fixed exchange rate (25 Baht/$).
  - There are smart investors expecting baht to be depreciated due to the fact the foreign exchange reserve in Thailand is primarily from borrowing (OFCF).

- They would go to currency swap contract between baht and US dollar.

- If the currency swap deal is made, these investors would get baht (X million) today and then they have to deliver it back in the next two months (X million baht) at the fixed rate, say 25 baht/$.

- If these investors failed to deliver, they must pay compensations to their swap partners.

- At the beginning of period, these investors will have baht. They can exchange for dollar at 25 baht/$.

- If baht is eventually depreciate within the next two months (say 35 baht/$), the dollar amount (X/25 million) held by the investor would be have 35*X/25 million (Baht).

- After enjoying profit from their correct expectation, the investors can deliver baht back to their swap partners and earn another profit (only X million baht to be delivered).

- The central bank worry about the currency in the offshore market (baht used in the currency swap transaction abroad) and wants to collect them back to onshore market.

- If the central bank realizes that there are smart investors speculating baht currency and want to teach them lesson, the central bank can use currency swap to enhance foreign exchange reserve.

- The central bank has a currency swap get dollar (X/25 million) today and will deliver dollar in the next two months and a half.

- The additional X/25 million dollar would enhance ability of central bank to collect baht in the offshore market with no effect on currency value (No affect on your FX reserve backup). This allows the central bank collect all baht in the offshore market.

- If the central bank successfully collect all amount of baht in the offshore market before the smart investors, the smart investors would not be able to deliver baht as in their currency swap and get loss.

- As in our setting, currency swap duration between central bank and smart investor is a half month. Hence, the central bank can return baht at the fixed rate to the market and deliver dollar as in its currency swap. This would avoid currency depreciation.

- Can the central bank miscalculate amount of baht in the offshore market? If so, what would happen?

Derivative Market
(Trading Right to buy and sell)

- Currency option is the clear example.
- Currency option is the right, but not the obligation to buy (Call Option) or sell (Put Option) a specific amount of the underlying currency at a specified exchange rate (referred to as the strike price) on a predetermined date (expiration date).
- For this right, the Option buyers pays a premium to the Option seller.
- Simple currency option is known as ‘plain vanilla’.

Consider the following example

Company A needs US$ 1 million in the next three months (Say April) and wants to use currency option.

There are currency option with 3 months duration and striking price 29.5 Baht/US$

Which option Company A would buy (Call or put option)?

In the next three months, if the exchange rate is 30 Baht/ US$. What would be the best response for Company A.

Complicated Products: Exotic Option

- Knock-out currency option: a currency option which will terminate in whole if the spot rate reaches the predetermined exchange rate (barrier level) at any time within the specified period.

- Average strike currency option: a currency option which has a strike price calculated based on the average foreign exchange rates (2 decimal places) of the underlying currencies for a pre-specified period. *(Note: The strike price is unknown until the end of the recording period).*

- *A Flat Forward :* a series of foreign exchange forward contracts with one agreed exchange rate and different delivery dates. A uniform FX rate is used regardless of the delivery dates.

- These products have not been developed in Thailand, partly due to the lack of demands.

Firms' Hedging Behaviors

- What is the motivation for firms to buy products in the foreign exchange market?
- When exchange rate is expected to be changed, there is risk associated with the changes.
- Assume that agents are generally risk averse, there is incentive for firms to avoid the exchange rate risk.
- One way to avoid the risk is to buy products in the foreign exchange market.

Example of Thai Garment Exporters

- Nike seek suppliers to produce a new design of its sport shirt collection. Often it is global bidding, competing with other suppliers worldwide. The bidding starts three months before delivery.

- If you are a Thai garment exporter and want to win the bidding, you must offer the competitive price for Nike. You will win if you can offer the lowest price as well as fulfill all requirements imposed by Nike.

- The bidding price must be in US$. What would you do?

- You would carefully estimate the cost of production, based on the sample (i.e. prototype) Nike provided.

- Generally, the cost consists of two parts; local materials and imports. For simplicity, we assume there are local materials only. Hence, the estimated cost would be in Baht.

- In a country that exchange rate is changeable, exchange rate today and three months later can be different. In fact you never know for sure what the exchange rate would be. There is risk involved. You receive in dollar (from Nike) but pay in baht (to local suppliers)

- To avoid the risk, we can buy products in the foreign exchange market such as forward contract or currency option.

- In the forward contract, you are making deal today for future transactions (here 3 months) at agreeable rate. Suppose exchange rate today is 30 baht (Spot rate). In the next three months, commercial bank offers you the rate 29 baht, which is referred to the forward rate. When you buy the forward rate, you can be certain about your revenue.

- Suppose your production cost per unit is 250 baht and your pricing strategy is 10 per cent mark-up. The price you offer to Nike in the bidding is 250(1*0.1) = 275 baht.

- And then, you convert into US$ using the forward rate, i.e. 275/29 = 9.48 $.

- In this circumstance, whatever the exchange rate in the next three month is, you *are going to* receive 275 baht a shirt for sure.

- The currency option can help to reduce risk. Say, instead of buying a forward contract, you might buy pull option (right to sell). Suppose a commercial bank offers you the striking price at 29 baht.

- Under the currency option, firms can choose whether to exercise the right to sell or to sell in the market. If the next three months, the exchange rate is 31 (28) baht/$, what would you do?

Sale Revenue in each scenario

Suppose you win the bidding, selling at 9.48 $ a unit and the total order is 1 million unit.

1. Not buying any product in FX market

   *Market rate(Baht/$) *9.48 ($/Unit)*1,000,000 (Units)*

2. Buying forward in FX market

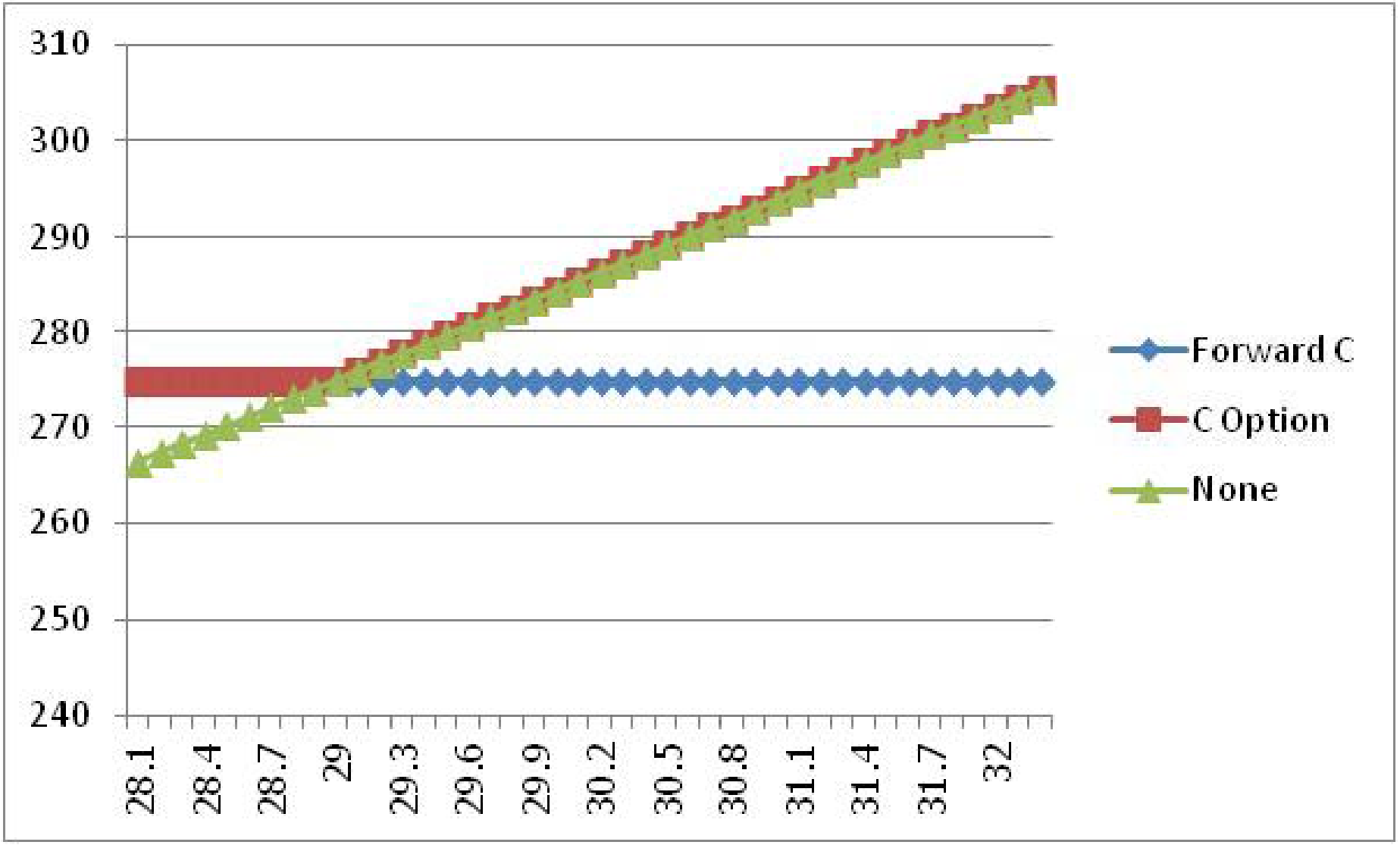
   *29 (Baht/$) *9.48 ($/Unit)*1,000,000 (Units)= 274.92 million baht*

3. Buying currency option in FX market

   *Market rate < 29; 29 (Baht/$) *9.48 ($/Unit)*1,000,000 (Units)*

   *Market rate>29: Market rate(Baht/$) *9.48 ($/Unit)*1,000,000 (Units)*

Three Scenarios of Foreign Exchange Income



Extension 1: Cost Free Assumption

- So far we assume cost-free for forward contract and currency option so that currency option is the most favorable choice, followed by forward contract.
- In fact, buying currency option incurs costs to firms. Decision in favor currency option is less clear.
- In many cases, there are legal constraints involved and to certain extent discriminatory in nature.

- For the derivative transaction between local firms and foreign bank, both parties must sign a formal contract in line with International Swaps and Derivative Association(ISDA) regulation.

- Foreign and local banks are not equal footing so that the level of competition would be constrained. In this circumstance, consumers might be excessively charged.

Extension 2: Imported Inputs

- In fact, firms might rely on imported inputs. Hence, there would be both revenue and expense in foreign currency.

- This would reduce the risk of foreign exchange changes to the firm even though there might be imperfect matching.

- You would receive foreign currency in 6 months but have to pay your foreign suppliers in 3 months. This is the case of mismatching.

- The mismatching would be less when we assume the continuity, firms operate a whole year around, e.g. The continue flows of order from Nike every month and order fabric from Taiwanese suppliers every month.

Extension 3: How forward rate is formulated?

- Can we always get the desirable forward rate? (Say, exporters want currency depreciation at least from the date you made deal with customers)

- The answer is no. Forward rate is determined according tThe larger the size you are, the closer the desirable rate you can get.

- Note that size here is referred the size in foreign exchange market transaction instead of firm size in the general perception.

- In principle, commercial banks would set forward rate according to the UIP principle.

- Firm A wants to buy $ 1 million in the next three months.

- The Bank will keep $1 million now and invest in risk-free asset with 3 months maturity. Suppose the return is r* for three months. At the meantime, the bank experiences forgone income ($1 million to get return in baht at the rate, r).

- What the bank is doing is to square its position, taking no risk, i.e. the bank can deliver $ 1million in the next three months.

- Revenue: $1,000,000\left(1+r^{*}\right)$

- Foregone revenue $\dfrac{1,000,000 * S_S * \left(1+r\right)}{S_F}$

Formulate of Forward Rate

$$1,000,000\left(1+r^{*}\right)=\frac{1,000,000*S_S*\left(1+r\right)}{S_F}$$

$$1+r^{*}=\frac{S_S*\left(1+r\right)}{S_F}$$

$$\frac{S_F}{S_S}=\frac{1+r}{1+r^{*}}$$

- In reality, the rate offered varies according to firm size due to transaction costs and the limited competition in the market.

- There are two markets in the foreign exchange; inter-bank and bank-customers. In the former, the rate is very competitive and dynamic.

- Inter-bank market is approaching to perfect competitive. Information is perfect and available on line.

- For example, 17 January 2012 11.32 am, there were bid rate (Banks buy foreign currency from customers) and offer rate (Banks sell foreign currency to their customers). Bid rate is usually lower its corresponding offer rate.

- The rate moves up and down according to demand for and supply of foreign exchange .

- Forward premium/ discount will be shown.

- Suppose there is forward premium (Baht tends to depreciate), premium on bid and offer could be slightly different. That is, 0.065/0.085 baht/$, determined according to uncovered interest parity formula.

- For exporters who want to have a forward contract (to sell dollar) a month, the forward rate is bid rate+0.065 baht.

- For importers who want to have a forward contract (to buy dollar) a month, the rate is offer rate +0.085 baht/$.

- For large firms, they can afford for hardware and software to get information in the inter-bank market. Installing hardware and software equipments incur fixed cost. Large corporate is more likely to get the competitive rate.

- For smaller firms, it would be more difficult to cover the fixed costs. The rates for smaller firms would be worse than those offered to large firms.

Exporters: Bid rate +forward premium –firm bargaining (sell dollar at the cheaper rate)

Importers: Offer rate+ forward premium-firm bargaining (buy dollar at the more expensive rate).