Examples of Treatment of Currency Forwards in Monetary Statistics

A currency forward contract consists of a commitment to transact a specified amount of a specified foreign currency, at a designated future date and at an agreed-upon exchange rate.

Example: Currency forward (simplified)

Assume Bank A and Bank B enter into a currency forward contract on June 30, whereby Bank A commits to deliver and Bank B commits to purchase $100,000 in six months time at a specified forward exchange rate. On June 30 of a particular year, the spot exchange rate is 80.50 Pakistani rupees per dollar, the interest rate for US dollar is 2.93 percent, and the interest rate for rupee is 12.7 percent. The forward exchange rate for this forward contract would then normally be equal to 84.23, based on the interest rate parity theorem[1].

For this forward contract, initially no records in asset/liability positions of both banks will be made because at the time of inception a forward contract has a zero value. However, as the exchange rate and the interest rate for US dollar and the interest rate for rupee change, an asset/liability position will be created for the two parties of the contract as follows:

Scenario 1

1. Assuming that the Pakistani rupee depreciates against the dollar and the exchange rate stands at 83.0 rupees per dollar at the end of the first month, the following records will be made for MFS purposes, provided profit/loss from derivatives is recorded monthly, and the interest rates have not changed:

Bank A

1. *Expenses*
Losses from financial derivative contracts — 187,048.37 rupees[2]

2. *Liabilities*
Financial derivative contracts FC — + 187,048.37 rupees

Bank B

1. *Income*
Income from financial derivative contracts — 187,048.37 rupees
2. *Assets*
Financial derivatives FC — + 187,048.37 rupees

Consequently, the following positions in financial derivatives and profit/loss accounts will be accumulated at the end of the first month:

Bank A
Profit/loss
Losses - 187,048.37 rupees
Liabilities
Financial derivatives FC - 187,048.37 rupees

Bank B
Profit/loss
Income - 187,048.37 rupees
Assets
Financial derivatives FC - 187,048.37 rupees

2. Assume that at the settlement date the exchange rate stands at 87.5 rupees per dollar. The following records will be made before the settlement is done, provided the interest rates still have not changed (assume no further revaluations had been done after the first month):

Bank A

1. *Expenses*
Losses from financial derivative contracts — 139,951.63 rupees (327,000-187,048.37)
2. *Liabilities*

Financial derivative contracts FC — + 139,951.63 rupees (327,000-187,048.37)

Bank B

1. *Income*
Income from financial derivative contracts — 139,951.63 rupees
2. *Assets*
Financial derivatives FC — + 139,951.63 rupees

Consequently, the following positions in financial derivatives and profit/loss accounts will be accumulated before the settlement:

Bank A
Profit/loss
Losses - 327,000.00 rupees
Liabilities
Financial derivatives FC - 327,000.00 rupees

Bank B
Profit/loss
Income - 327,000.00 rupees
Assets
Financial derivatives FC - 327,000.00 rupees

3. The following records will be made when the US dollars and rupees are delivered by Bank A and bank B, respectively:

Bank A

1. *Assets*

Currency and deposits FC — - 8,750,000.00 rupees (payment of $100,000.00 at exchange rate of 87.5 rupees per dollar)
Currency and deposits NC — + 8,423,000.00 rupees (payment received in rupees for $100,000.00 at the agreed forward exchange rate of 84.23 rupees per dollar)
2. *Liabilities*
Financial derivatives FC — - 327,000.00 rupees (cancellation of the accumulated liability for the currency forward)

Bank B

Assets
Currency and deposits, NC — - 8,423,000.00 rupees (payment in rupees for $100,000.00 at the agreed forward exchange rate of 84.23 rupees per dollar)
Currency and deposits FC — + 8,750,000.00 rupees (payment received of $100,000.00 at exchange rate of 87.5 rupees per dollar)
Financial derivatives FC — - 327,000.00 rupees (cancellation of the accumulated asset for the currency forward)

Scenario 2

1. Assuming that the Pakistani rupee appreciates against the dollar and the exchange rate stands at 80.0 rupees per dollar at the end of the first month, the following records will be made for MFS purposes, provided profit/loss from derivatives is recorded monthly, and the interest rates have not changed:

Bank A

1. *Income*
Income from financial derivative contracts — 109,363.39 rupees
2. *Assets*
Financial derivative contracts NC — + 109,363.39 rupees

Bank B

1. *Expenses*
Losses from financial derivative contracts — 109,363.39 rupees
2. *Liabilities*
Financial derivatives NC — + 109,363.39 rupees

Consequently, the following positions in financial derivatives and profit/loss accounts will be accumulated at the end of the first month:

Bank A
Profit/loss
Income - 109,363.39 rupees
Assets
Financial derivatives NC - 109,383.39 rupees

Bank B
Profit/loss
Losses - 109,363.39 rupees
Liabilities
Financial derivatives NC - 109,363.39 rupees

2. Assume that at the settlement date the exchange rate stands at 83.5 rupees per dollar. The following records will be made before the settlement is done, provided the interest rates still have not changed (assume no further revaluations had been done after the first month):

Bank A

1. *Expenses*
Losses from financial derivative contracts — 36,363.39 rupees (109,363.39-73,000.00)

2. *Assets*
Financial derivative contracts NC — - 36,363.39 rupees (109,363.39-73,000.00)

Bank B

1. *Income*
Income from financial derivative contracts — 36,363.39 rupees
2. *Liabilities*
Financial derivatives NC — - 36,363.39 rupees

Consequently, the following positions in financial derivatives and profit/loss accounts will be accumulated before the settlement:

Bank A
Profit/loss
Income - 73,000.00 rupees (109,363.39-36,363.39)
Assets
Financial derivatives NC - 73,000.00 rupees

Bank B
Profit/loss
Losses - 73,000.00 rupees
Liabilities
Financial derivatives FC - 73,000.00 rupees

3. The following records will be made when the US dollars and rupees are delivered by Bank A and bank B, respectively:

Bank A

Assets
Currency and deposits, FC — - 8,350,000.00 rupees (payment of $100,000.00 at exchange rate of 83.5 rupees per dollar)
Currency and deposits, NC — + 8,423,000.00 rupees (payment received in rupees for $100,000.00 at the agreed forward exchange rate of 84.23 rupees per dollar)
Financial derivatives NC — - 73,000.00 rupees (cancellation of the accumulated asset for the currency forward)

Bank B

1. *Assets*
Currency and deposits NC — - 8,423,000.00 rupees (payment in rupees for $100,000.00 at the agreed forward exchange rate of 84.23 rupees per dollar)

Currency and deposits FC — + 8,350,000.00 rupees (payment of $100,000.00 received at exchange rate of 83.5 rupees per dollar)

2. ***Liabilities***

Financial derivatives NC — - 73,000.00 rupees (cancellation of the accumulated liability for the currency forward)

Notes:

1. The following formula is used to calculate the forward exchange rate: $F=S(1+r_{pr})^N/(1+r_{us})^N$, where *S* denotes the spot exchange rate (80.5 in our example), r_{pr} denotes the risk-free interest rate for rupee per annum (0.127 in our example), r_{us} denotes the risk-free interest rate for US dollar per annum (0.0293 in our example), and N denotes the time until the settlement of the forward contract in years (6/12=0.5 in our example). If the interest rates are continuously compounded, the formula would be $F=Se^{(rpr-rus)N}$.

2. The following formula is used to calculate the value of the short forward contract for Bank A: $fS=F(1+rpr)^{-N}-S(1+rus)^{-N}$, where all notations are the same as in the footnote above (-187,048.37=100,000*(84.23*(1+0.127)$^{-5/12}$ - 83.0*(1+0.0293)$^{-5/12}$)). To derive the value of a currency forward contract at any point in time, the formula basically compares present values of the foreign exchange and national currency to be delivered at the settlement date, using the current spot exchange rate and the forward delivery exchange rate. For our example, the above calculations may be rewritten as follows: 8,423,000.00*(1+0.127)$^{-5/12}$ - 8,300,000.00*(1+0.0293)$^{-5/12}$ = -187,048.37.