

**11th Meeting of the Advisory Expert Group on National Accounts,
5-7 December 2017, New York, USA**

Agenda item: 16

Recording of Central Bank Swap Arrangements in Macroeconomic Statistics

Introduction

The 2016 BOPCOM meeting identified the need to clarify the treatment of currency swaps agreements between central banks. The increasing importance of these arrangements underscored the need for uniformity of statistical treatment. Accordingly, the IMF drafted the document on Recording of Central Bank Swap Arrangements in Macroeconomic Statistics which was sent for comments to BOPCOM members, through a process of written consultation. The paper was revised following the consultation and the 2017 BOPCOM meeting agreed with the proposed changes. The attached is an update of the paper to address the proposed changes

The paper proposes the following two options to recorded Central Bank swap arrangements:

- (i) Record off-market central bank currency swaps as an exchange of deposits with maintenance of value; and
- (ii) Record standard (market priced) central bank currency swaps as an exchange of deposits with the simultaneous creation of a financial derivative, namely a forward contract.

Main issues to be discussed

Paper on: Recording of Central Bank Swap Arrangements in Macroeconomic Statistics

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The AEG is requested to:

- Express its views on the issues and evaluate the consistency of the options with the concepts and principles of the 2008 SNA by 22 December 2017.

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Recording of Central Bank Swap Arrangements in Macroeconomic Statistics

1. **In the past few years, several central banks have entered reciprocal currency arrangements through the temporary exchange of deposits.** The exchange provides one or both of the central banks that are part of the contract with assets that can be used to meet the economy's balance of payments financing needs and/or to provide local markets with foreign exchange liquidity. Because typically these arrangements are not a standard currency swap operation,¹ they warrant mention in the *BPM6* (paras. 6.102–6.104) and the *MFSMCG* (para. 4.175).

2. **This note discusses possible options to record central bank swaps and recommends the preferred treatment of these arrangements in macroeconomic statistics, based on past statistical guidance and central banks' accounting practices.**² The annex presents examples of the recording in monetary and balance of payments statistics of the recommended option presented in this note.

Standard Currency Swap

3. **A foreign currency swap is a spot sale/purchase of currencies and a simultaneous forward purchase/sale of the same currencies** (*MFSMCG*, para. 4.171). In the case of a standard currency swap, the recommendation is to record the spot sale of the currencies and, simultaneously, record a forward contract (derivative) at its market value.

4. **If the forward contract is correctly priced based on the spot rate of the currencies and the interest rates in their respective economies, its value at inception will be zero.**³ For example, if Bank A enters in a swap with Bank B to exchange 1,000,000 units of currency A against 1,200,000 units of currency B (spot exchange rate 1.0:1.2), with the commitment to revert the operation in one year, and the interest rates in countries A and B are 3 percent and 5 percent p.a., respectively, the forward exchange rate should be—according to the uncovered interest rate parity—**1.0:1.2233**.

¹ They do not usually follow standard market conditions (e.g., exchange rates and market interest rates prevailing in the respective economies)

² The accounting treatment of these transactions in some central banks may differ from the statistical treatment that is being recommended in this note.

³ The uncovered interest rate parity states that the forward rate in such contracts is set according to the formula $\text{Forward rate} = \text{Spot rate} \cdot (1 + r_n)^t / (1 + r_f)^t$, where r_n and r_f are the domestic and foreign interest rates, and t is time.

5. **Over the contract's life, as time lapses, spot exchange rates fluctuate, and interest rates change, the value of the forward contract can be positive (asset) or negative (liability) to the parties involved.** If after six months the spot exchange rate and the interest rates remain unchanged, the value of this forward contract will be a liability of 9,520 (in currency A) for Bank A and a corresponding asset of 11,424 for Bank B (in currency B), reflecting the shorter discount time for the future cash flows.⁴

Central Bank Currency Swaps

6. **Swap arrangements between central banks do not typically conform fully to a standard currency swap between market participants.** Here, one central bank exchanges a certain amount of its currency with the partner central bank for the other country's currency at the spot exchange rate, with the commitment to unwind the operation on a future date, at an agreed exchange rate (normally, the spot rate of the date of the original transaction). The foreign currency so acquired is usually held in an account at the partner central bank. Depending on the contract, one central bank may pay an interest to the other central bank on the amount of foreign currency used under the general swap arrangement. Also, margin calls may be required to account for exchange rate fluctuations, which are to be credited to the partner's deposit account if certain thresholds are crossed or at certain frequency.

7. **The BPM6 (para. 6.102) and the MFSMCG (para. 4.175) describe such arrangements as an exchange of deposits (in foreign exchange) between the partner central banks.** The funds received can be considered as reserve assets, if they meet the general criteria of being denominated and settled in convertible foreign currencies, being readily available to and controlled by monetary authorities in the most unconditional form, etc. (BPM6, paras. 6.64–6.75). If the criteria are not met (e.g., if the use of the funds is subject to any authorization by the counterpart central bank), the funds would not conform to the definition of reserve assets and the deposit should be recorded as “other investment” in external sector statistics.

8. **Swap arrangements with different purposes are conducted between central banks.** For example, the U.S. Federal Reserve has entered into agreements to establish dollar and foreign-currency liquidity swap lines with the European Central Bank (ECB) and a number of other foreign central banks (see https://www.federalreserve.gov/monetarypolicy/bst_liquidityswaps.htm). The People's Bank of China (PBC) has also entered in currency swap arrangements with other economies' central banks, in some cases to provide those central banks with foreign assets that can be

⁴ The formula for calculating the value of a forward contract at a point of time during its life is

Fair Value = $FC \cdot [F \cdot (1+r_f)^t - S \cdot (1+r_s)^t]$, where FC is the notional value of the forward contract, F the agreed forward exchange rate, and S the spot exchange rate at the time the contract is valued. In our example, for CBA this results in $1,223,301 \cdot [0.81746 \cdot (1+0.03)^{-0.5} - 0.83333 \cdot (1+0.05)^{-0.5}] = -9,520A$;

0.81746 and 0.83333 are the forward and spot exchange rate of currency B expressed in units of currency A, and $t = 0.5$ because the contract is being valued at mid-term of its maturity.

used to meet balance of payment financing needs, to contribute to the internationalization of the Renminbi and/or to facilitate trade with those economies. Other central banks have also entered into similar agreements.

9. **No transaction should be recorded until the money is put at the disposal of the respective central banks.**⁵ Normally, central bank currency swaps take place under an umbrella/master agreement. Individual swap transactions are carried out for a fraction of the amount agreed in the master swap agreement, but the total principal amount outstanding cannot exceed in aggregate the maximum agreed in the master swap agreement. For accounting and statistical purposes, only the individual swap transactions should be recorded, since the remaining amount until the ceiling of the master agreement is contingent upon the parties, and therefore outside the financial asset boundary. In other words, until the money is disbursed the swap is to be considered as a contingent asset (i.e., like an undrawn line of credit or a guarantee) and no financial asset should be recognized (*BPM6*, para. 5.10).

Recommended treatment

10. **In line with the *BPM6* and the *MFSMCG*, when these currency swaps do not have the characteristics of a standard (market priced) contract (as is usually the case between central banks) this note recommends recording the currency swap transactions as an exchange of deposits with maintenance of value.** Generally, the forward exchange rate is not priced based on the market interest rates prevailing in the economies entering in the contract.⁶ Additionally, an interest is usually charged on the used portion of the deposit. The proposed treatment, described as *Option A*, involves the recording of two deposits with the commitment to unwind the operation on a future date at an agreed exchange rate.

11. **If these currency swaps had the characteristics of a standard (market priced) contract, the recommended treatment would be the recording of a financial derivative transaction, which implies the exchange of deposits as a spot operation and simultaneously entering in a forward contract.** This approach (*Option B*) properly records external assets and liabilities involved in the transaction. This requires that the forward contract be properly priced based on the market interest rates prevailing in the economies, and considering any interest charge on the used funds.

Option A – Exchange of Deposits with Maintenance of Value

⁵ As mentioned in paragraph 7, once the swap is activated to be considered as reserve assets the funds must be readily available to and controlled by monetary authorities in the most unconditional form, i.e. the use of the funds should not be subject to any authorization by the counterpart central bank.

⁶ In principle, if the conditions of the contract included an element of grant or concession, an adjustment should be made such that the transactions be recorded at market prices and the difference between the actual and the market price should be recorded as a transfer (*BPM6*, para. 3.79). Such a concessional element could also be shown through supplementary information (*BPM6*, para. 12.51).

12. **When the currency swap does not have the characteristics of a standard (market priced) contract, the transaction will be treated as an exchange of deposits between the central banks, with the obligation to unwind the operation at a fixed exchange rate on a specified date.** Under this option, the deposit of central bank A (CBA) held with the counterpart central bank B (CBB) is a foreign asset of CBA, denominated in foreign currency and part of its international reserves if they meet the general criteria for being reserve assets. A similar treatment would be applied to the deposits of CBB held with CBA, as relevant.

13. **The deposit issued by CBA and held by CBB is a foreign liability of CBA denominated in domestic currency, but fully linked to a foreign currency.** This is so, because CBA has an obligation to buy-back the foreign currency at the agreed exchange rate paying the spot exchange rate prevailing on the delivery date. **Therefore, this account should be treated as being denominated in that foreign currency** (BPM6, para. 3.101). To accomplish this, periodic revaluation adjustments on the CBB's deposit account should be carried out to ensure the appropriate recording of the actual outstanding amount that is owed—the amount of foreign currency to be reimbursed in the simultaneous forward transaction at the end of the arrangement, including any interest payment. A similar recording will take place at CBB.

14. When a counterpart central bank (say, CBB) withdraws funds from the deposit account, there will be a decrease in the external liabilities (deposits) of CBA, which will then not fully reflect its obligation to repurchase the full amount in national currency of the original operation delivering foreign currency. However, CBB will need to replenish its deposit account with CBA before the contract is unwound.

Option B – Exchange of Deposits with a Simultaneous Forward Contract

15. **When the currency swap has the characteristics of a standard (market priced) contract, the recommendation is to treat the currency swap arrangement as a standard currency swap,** namely the purchase of foreign currency with local currency, and the simultaneous recognition of a forward contract for the obligation to unwind the operation at a certain date. The value of the forward will be determined by the agreed forward rate and the discounted spot exchange rate using the market interest rates in both economies, including any interest charges to be paid when the central banks use the balances of their deposit accounts.

16. **When the transaction is initiated, it will be recorded as an increase in assets/deposits (in foreign currency) of each central bank, with the corresponding offsetting entry in liabilities, denominated in domestic currency. The arrangement will also involve the recording of a financial derivative (asset or liability), once the forward contract has some market value.**⁷ The balances of the deposit accounts reflect the initial

⁷ The financial derivative should be recorded in external statistics as any other financial derivative contract.

deposit *less* any withdrawal, and no maintenance of value is needed for the liability deposit account denominated in national currency. The financial derivative should be periodically revalued to reflect market conditions, and will be an asset or liability of the counterpart central banks, depending on the spot exchange rate, interest rate, and time to maturity.

17. **The liability deposit will reflect maintenance of value if the derivative contract is periodically settled through margin payments.** This is particularly important for the appropriate recording of the external debt of the central bank requesting the funds.

Other (not recommended) options

Credit line facility

18. **The economic nature of the umbrella agreement of currency swap arrangements might resemble the opening of a credit line facility.** When one central bank requests the drawing of funds through a swap transaction, the counterpart central bank might record the provision of currency as a loan to the other central bank, which is collateralized by a deposit account of the former opened at the latter. The undrawn portion of the agreement is considered as a contingent asset (see par. 9). To avoid double counting of external assets and liabilities, this approach would require recording one of the exchanged deposits off-balance sheet, which is contrary to central banks accounting practices. The recording of the deposits in the IIP (*RDT Guide A7.27*) would not be reflected, either. Therefore, this way of recording is not recommended.

Use of Fund Credit

The use of Fund Credit could be seen as similar to a central bank currency swap. However, the IMF credit is a “one-way” transaction with a predetermined debt-service payment schedule—where the IMF does not use the currency of the member—making it in practice similar to a loan.

“The provision of financial assistance by the IMF to its members through the General Resources Account (GRA) is not “lending” either technically or legally. IMF financial assistance provided through the GRA takes place by means of an exchange of monetary assets, similar to a swap. Nevertheless, this purchase and repurchase of currencies from the IMF, with interest charged on outstanding purchases, is functionally equivalent to a loan and its subsequent repayment.”
(International Monetary Fund, *IMF Financial Operations, 2015*, footnote 5, page 4)

In balance of payments statistics, use of fund credit (UFC) is classified in the category loans, whereas the sale of domestic currency to the *IMF N° 1 Account* is not shown as a balance of payments transaction or in the international investment position (*BPM6*, paras. 5.51 and 7.79). In monetary statistics, the central bank’s sectoral balance sheet includes purchases of the Fund’s resources in exchange for domestic currency in the *IMF N° Account*, which also records the payment of the domestic currency component of the IMF quota subscription (*MFSMCG*, para. 4.245). However, the central bank survey is presented on an analytical net basis, showing the *Reserve position in the Fund* as a reserve asset and the UFC as a loan liability, excluding in this presentation the balance of the *IMF N° 1 Account*.

Quadruple Recording of Exchange of Deposits

19. **The recording of central bank currency swaps through a quadruple entry is not recommended.** This treatment has been observed in the praxis, with central banks recording the swap as two pairs of asset and liability entries. Each central bank will record a foreign asset (loan) in domestic currency for the amount of the funds provided, and as a contra-entry a foreign liability (also in domestic currency) for the deposit account opened to deliver the funds. The mirror transactions will be a foreign liability (loan from the other central bank) and a foreign asset (deposit placed with the other central bank), in both cases in foreign currency.

20. This approach splits into two transactions what is actually a single operation. Additionally, it double counts external assets and liabilities of the involved central banks (i.e., their external debt as well as their external assets). To correct this, it is necessary to net out the additional assets in domestic currency with the additional liabilities in foreign currency, with the difference added to the liability deposit account in domestic currency. Therefore, this way of recording is not recommended.

Summary

21. **This note recommends the statistical treatment of off-market central bank currency swaps as an exchange of deposits with maintenance of value (option A).** Following this approach, each central bank acquires a foreign asset in foreign currency, and creates a foreign liability in domestic currency. Since the liability deposit account in domestic currency is fully indexed to a foreign currency, a valuation adjustment account linked to the former should be created and its carrying balance periodically adjusted to reflect the total amount of domestic currency needed to buy the foreign currency to be delivered, including any interest payment.

22. The advantages of the recommended approach are that it does not imply any duplication of assets/liabilities nor any off-balance sheet recording.

23. **If the central banks conduct the transaction as a standard (market priced) currency swap, then it is recommended to record the swap as an exchange of deposits with the simultaneous creation of a financial derivative, namely a forward contract (Option B).** Both central banks will have an asset in foreign currency and a liability in domestic currency for the exchanged deposits, and a financial derivative whose value (asset or liability) will fluctuate depending on the spot exchange rate, interest rates agreed for the use of funds, prevailing market interest rates, and time to maturity at the moment of valuation. As in Option A, symmetric recording by both central banks should be ensured. To implement this option, both central banks should properly estimate the value of the financial derivative based on exchange rates and interest rates in both economies.

24. **The quadruple-entry recording in the accounting balance sheet of central banks is not recommended.** This treatment should be discouraged, since it double-counts external assets and liabilities of each counterpart. In this case, a netting out of the additional accounts is required.

Against this background, the views of the ISWGNA and the GFSAC members are sought on the recommendation to

- (i) record off-market central bank currency swaps as an exchange of deposits with maintenance of value; and**
- (ii) record standard (market priced) central bank currency swaps as an exchange of deposits with the simultaneous creation of a financial derivative, namely a forward contract.**

Annex 1. Implications of the Proposed Solution for Fund Programs

25. The net international reserves (NIR) is among the variables included in the performance criteria and indicative targets set out in Fund programs. Operationally, the NIR is the difference between the country's gross reserve assets and its reserves-related liabilities. The note recommends treating central bank currency swap transactions as an exchange of deposits between two parties, with the obligation to unwind the operation at a fixed exchange rate on a specified date. As noted below, implementation of a central bank currency swap will increase the gross international reserves, but not the NIR.⁸

26. Under the proposed treatment, **deposits (in foreign exchange) acquired by the central bank initiating the arrangement can be treated as reserve assets if they meet the general criteria** of being denominated and settled in convertible foreign currencies, being readily available to and controlled by monetary authorities in the most unconditional form, etc. (*BPM6*, paras. 6.64–6.75). If the use of the funds is subject to any authorization by the counterpart central bank, the funds would not conform to the definition of reserve assets.

27. **Deposit liabilities arising from foreign currency swaps with other central banks are reserve-related liabilities.**⁹ Reserve-related liabilities are defined as foreign currency liabilities of the monetary authorities that can be considered as direct claims by nonresidents on the reserve assets of an economy (*BPM6*, paras. 6.115–6.116).

28. **The related liability would usually be recorded as exceptional financing (below the line).** In the analytic presentation of the balance of payments, the foreign deposit liability denominated in domestic currency but fully linked to a foreign currency would be shown below the line, because the main motivation of the transaction is to provide those central banks with foreign assets that can be used to meet balance of payments financing needs. This is consistent with the standard definition of NIR used in Fund programs.

29. Regarding the maturity of the liability, **individual swap transactions are usually short-term transactions.**¹⁰ They are normally carried out for a fraction of the maximum amount agreed in the umbrella contract. For accounting and statistical purposes, only the money disbursed (i.e., not the maximum amount of the contract) should be recorded. Until then, the agreement is to be considered as a contingent asset (like a credit line) (i.e., outside the financial asset boundary). In other words, no transaction should be recorded until the money is put at the disposal of the respective central banks.

⁸ This conclusion is equally applicable to both the preferred option (exchange of deposits) as well as to the other acceptable option (spot sale of currencies plus financial derivative)

⁹ Of course, subject to the related assets conforming fully to the definition of reserve assets.

¹⁰ In which case, the liability should be recorded as predetermined short-term drains on reserves in the Data Template on International Reserves and Foreign Currency Liquidity (<http://www.imf.org/external/np/sta/ir/IRProcessWeb/index.aspx>)

Annex 2. Numerical Examples for Recording Central Bank Currency Swaps

This annex provides numerical examples on the way to record central bank currency swaps in monetary and external sector (IIP statement) statistics, according to the recommended approaches described in the note.

On **November 30, 2016**, Central Bank A (CBA) and Central Bank B (CBB) sign an agreement to establish a bilateral currency swap arrangement for up to \$A 10 billion. Under this agreement, one central bank (the “requesting” party) can request from the other central bank (the “providing” party) to purchase a certain amount of the other country’s currency in exchange for its own currency, with the commitment to repurchase its own currency with the other country’s currency at a future date. The total amount drawn through successive requests cannot exceed \$A 10 billion. The currencies will be credited in a non-interest bearing deposit account of the counterpart central bank at the other central bank. Interest must be paid on any amount withdrawn from these accounts, based on the market interest rate of the country’s used currency (to be paid at maturity).

On **January 2, 2017**: CBB requests from CBA to buy \$A 1 billion in exchange of \$B 1.2 billion (spot exchange rate: \$A 1.00 = \$B 1.20), with a commitment to unwind the transaction on December 31, 2017. Interest rates in country A and country B are 5 percent and 10 percent p.a., respectively, and do not change during the year.

On **March 31, 2017**: the currency of country B devalues to \$A 1.00 = \$B 1.40. Exchange rates do not change until the end of the year.

On **June 30, 2017**: CBB transfers \$A 500 million from its account at CBA to a current account in euros at its correspondent bank in Frankfurt. To pay for the transaction, CBA transfers the amount from its current account at the same bank.

On **September 30, 2017**: CBA uses \$B 280 million from its account at CBB to pay for imports from country B.

On **December 31, 2017**: the currency swap is unwound.

A. Exchange of Deposits with Maintenance of Value

November 30, 2016

No transactions recorded. (same for all other cases)

January 2, 2017

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	1,000	CBB's Deposit Account, NC	1,000

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	1,200	CBA's Deposit Account, NC	1,200

March 31, 2017

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	857	CBB's Deposit Account, NC	1,000
Maintenance of Value, CBB's Account CBB	143		

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	1,400	CBA's Deposit Account, NC	1,200
		Maintenance of Value, CBA's Account	200
Loss			Profit
Valuation Adj., CBA's Account	200	Valuation Adj., Account at CBA	200

Alternatively, if the valuation adjustment is credited to the CBA's deposit account, the recording will be:

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	1,000	CBB's Deposit Account, NC	1,000

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	1,400	CBA's Deposit Account, NC	1,400
Loss			Profit
Valuation Adj. CBA's Account	200	Valuation Adj. Account at CBA	200

June 30, 2017

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	1,000	CBB's Deposit Account, NC	500
Correspondent Account German Bank, FC	-500		

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	700	CBA's Deposit Account, NC	1,400
Correspondent Account German Bank, FC	700		

September 30, 2017

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	800	CBB's Deposit Account, NC	500
Accrued Interest, CBB's Account	6.14	Accounts Payable (Exporter Country B)	-200
Loss			Profit
		Accrued Interest, CBB's Account	6.14

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	700	CBA's Deposit Account, NC	1,120
		Resident Bank (Exporter's), NC	280
		Accrued Interest, Account at CBA	8.59
Loss			Profit
Accrued Interest, Use of Account at CBA	8.59		

December 31, 2017

Before the currency swap is unwound, reflecting that the central banks need to replenish their deposit accounts with the counterpart central bank:

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	1,000	CBB's Deposit Account, NC	1,000
Accrued Interest, CBB's Account	12.35	Accrued Interest, Account at CBB	4.82
Correspondent Account (buying of \$B)	-204.82		
Loss			Profit
Accrued Interest, Use of Account at CBB	4.82	Accrued Interest, CBB's Account	12.35

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	1,400	CBA's Deposit Account, NC	1,400
Accrued Interest, CBA's Account	6.75	Accrued Interest, Account at CBA	17.29
Correspondent Account (buying of \$A)	-717.29		
Loss			Profit
Accrued Interest, Use of Account at CBA	17.29	Accrued Interest, CBA's Account	6.75

Unwinding of the currency swap:

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	-1,000	CBB's Deposit Acc., NC	-1,000
Accrued Interest, CBB's Account	-12.35	Accrued Interest, Use of Account at CBB	-4.82

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	-1,400	CBA's Deposit Account, NC	-1,400
Accrued Interest, CBA's Account	-6.75	Accrued Interest, Account at CBA	-17.29

Recording on the IIP Statement

It is further assumed for compiling the IIP statement that:

- Country A-initial deposit at German Bank (G Bank): \$A million 500
- Initial trade credit and advances between country A (liability) and country B (asset): \$A million 200

	Position Nov-30-16	Transactions	Exchange rate changes	Other price changes	Position Jan-2-17
Country A (\$A million)	300				300
Assets	500				1500
Other investment, currency and deposits at CBB	0	1000			1000
Other investment, currency and deposits G Bank	500				500
Liabilities	200				1200
Other investment, currency and deposits CBB	0	1000			1000
Other investment, trade credit and advances (B)	200				200
 Country B (\$B million)	 240				 240
Assets	240				1440
Other investment, currency and deposits at CBA	0	1200			1200
Other investment, currency and deposits at G Bank	0				0
Other investment, trade credit and advances (A)	240				240
Liabilities	0				1200
Other investment, currency and deposits CBA	0	1200			1200

	Position	Transactions	Exchange rate changes	Other price changes	Position
	Jan-2-17				Mar-31-17
Country A (\$A million)	300				300
Assets	1500				1500
Other investment, currency and deposits at CBB	1000				1000
Other investment, currency and deposits G Bank	500				500
Liabilities	1200				1200
Other investment, currency and deposits CBB	1000				1000
Other investment, trade credit and advances (B)	200				200
Country B (\$B million)	240				280
Assets	1440				1680
Other investment, currency and deposits at CBA	1200		200		1400
Other investment, currency and deposits at G Bank	0				0
Other investment, trade credit and advances (A)	240		40		280
Liabilities	1200				1400
Other investment, currency and deposits CBA	1200		200		1400
	Position	Transactions	Exchange rate changes	Other price changes	Position
	Mar-31-17				Jun-30-17
Country A (\$A million)	300				300
Assets	1500				1000
Other investment, currency and deposits at CBB	1000				1000
Other investment, currency and deposits G Bank	500	-500			0
Liabilities	1200				700
Other investment, currency and deposits CBB	1000	-500			500
Other investment, trade credit and advances (B)	200				200
Country B (\$B million)	280				280
Assets	1680				1680
Other investment, currency and deposits at CBA	1400	-700			700
Other investment, currency and deposits at G Bank	0	700			700
Other investment, trade credit and advances (A)	280				280
Liabilities	1400				1400
Other investment, currency and deposits CBA	1400				1400

	Position Jun-30- 17	Transactions	Exchange rate changes	Other price changes	Position Sept-30- 17
Country A (\$A million)	300				306.14
Assets	1000				806.14
Other investment, currency and deposits at CBB	1000	-193.86			806.14
Other investment, currency and deposits G Bank	0				0
Liabilities	700				500
Other investment, currency and deposits CBB	500				500
Other investment, trade credit and advances (B)	200	-200			0
Country B (\$B million)	280				271.41
Assets	1680				1400
Other investment, currency and deposits at CBA	700				700
Other investment, currency and deposits at G Bank	700				700
Other investment, trade credit and advances (A)	280	-280			0
Liabilities	1400				1128.59
Other investment, currency and deposits CBA	1400	-271.41			1128.59
Before the currency swap is unwound	Position Sept-30-17	Transactions	Exchange rate changes	Other price changes	Position Dec-31- 17
Country A (\$A million)	306				308
Assets	806				1312
Other investment, currency and deposits at CBB	806	200+12.35-6.14			1012
Other investment, currency and deposits G Bank	0	300			300
Liabilities	500				1005
Other investment, currency and deposits CBB	500	504.82			1005
Other investment, trade credit and advances (B)	0				0
Country B (\$B million)	271				269
Assets	1400				1687
Other investment, currency and deposits at CBA	700	706.75			1407
Other investment, currency and deposits at G Bank	700	-420			280
Other investment, trade credit and advances (A)	0				0
Liabilities	1129				1417
Other investment, currency and deposits CBA	1129	280+17.29-8.59			1417

<i>After the currency swap is unwound</i>	Position Dec-31- 17	Transactions	Exchange rate changes	Other price changes	Position Dec-31- 17
Country A (\$A million)	308				307.5
Assets	1312				307.5
Other investment, currency and deposits at CBB	1012	-1012			0.0
Other investment, currency and deposits G Bank	300	7.53			307.5
Liabilities	1005				0.0
Other investment, currency and deposits CBB	1005	-1005			0.0
Other investment, trade credit and advances (B)	0				0.0
Country B (\$B million)	269				269.5
Assets	1687				269.5
Other investment, currency and deposits at CBA	1407	-1407			0.0
Other investment, currency and deposits at G Bank	280	-10.54			269.5
Other investment, trade credit and advances (A)	0				0.0
Liabilities	1417				0.0
Other investment, currency and deposits CBA	1417	-1417			0.0

B. Exchange of Deposits with a Simultaneous Forward

January 2, 2017

If the interest rate charged for using the deposits with the counterpart central bank is the market interest rate (assumed for this exercise), the forward rate will be, in practice, the spot exchange rate plus the foreign market interest rate (discounted at the domestic market interest rate, if the counterpart uses its deposit). Therefore, the forward contract has no value at inception and it will fluctuate only because of changes in the spot exchange rates.

Assets	CBA (mill. SA)		Liabilities
Deposit Account at CBB, FC	1,000	CBB's Deposit Account, NC	1,000

Assets	CBB (mill. SB)		Liabilities
Deposit Account at CBA, FC	1,200	CBA's Deposit Account, NC	1,200

March 31, 2017

Assets	CBA (mill. SA)		Liabilities
Deposit Account at CBB, FC	857	CBB's Deposit Account, NC	1,000
Financial Derivative, CBB	143		
Loss			Profit
Valuation Loss, Account at CBB	143	Valuation Gain, Forward CBB	143

Assets	CBB (mill. SB)		Liabilities
Deposit Account at CBA, FC	1,400	CBA's Deposit Account, NC	1,200
		Financial Derivative, CBA	200
Loss			Profit
Valuation Loss Forward CBA	200	Valuation Adj., Account at CBA	200

If the value of the contract is paid into the CBA's deposit account, the recording will be:

Assets	CBA (mill. SA)		Liabilities
Deposit Account at CBB, FC	1,000	CBB's Deposit Account, NC	1,000
Financial Derivative, CBB	0		

Assets	CBB (mill. SB)		Liabilities
Deposit Account at CBA, FC	1,400	CBA's Deposit Account, NC	1,400
		Financial Derivative, CBA	0

June 30, 2017

Due to the nature of the contract, the implicit forward rate of the CBB's withdrawal is \$A 1.00 = \$B 1.37 ($1.40/(1+.05)^{1/2}$), which gives a value of zero to this portion of the forward. For the valuation of the contract on future dates, the spot exchange rate will be discounted at the foreign market interest rate.

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	1,000	CBB's Deposit Account, NC	500
Correspondent Account German Bank, FC	-500		

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBB, FC	700	CBA's Deposit Account, NC	1,400
Correspondent Account German Bank, FC	700		

September 30, 2017

The implicit forward rate of the CBA's withdrawal is \$A 1.00 = \$B 1.43.

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	800	CBB's Deposit Account, NC	500
Financial Derivative, CBB	6.14	Accounts Payable (Exporter Country B)	-200
Loss			Profit
		Valuation Gain, Forward CBB	6.14

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	700	CBA's Deposit Account, NC	1,120
		Resident Bank (Exporter's), NC	280
		Financial Derivative, CBA	8.59
Loss			Profit
Valuation Loss, Forward CBA	8.59		

December 31, 2017

Before the currency swap is unwound:

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	1,000	CBB's Deposit Account, NC	1,000
Financial Derivative, CBB	12.35	Financial Derivative, CBB	4.82
Correspondent Account (buying of \$B)	-204.82		
Loss			Profit
Valuation Loss, Forward CBB	4.82	Valuation Gain, Forward CBB	12.35

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	1,400	CBA's Deposit Account, NC	1,400
Financial Derivative, CBA	6,75	Financial Derivative, CBA	17.29
Correspondent Account (buying of \$A)	-717.29		
Loss			Profit
Valuation Loss, Forward CBA	17.29	Valuation Gain, Forward CBA	12.35

Unwinding of the currency swap:

Assets	CBA (mill. \$A)		Liabilities
Deposit Account at CBB, FC	-1,000	CBB's Deposit Account, NC	-1,000
Financial Derivative, CBB	-12.35	Financial Derivative, CBB	-4,82

Assets	CBB (mill. \$B)		Liabilities
Deposit Account at CBA, FC	-1,400	CBA's Deposit Account, NC	-1,400
Financial Derivative, CBA	-6,75	Financial Derivative, CBA	-17.29

Recording on the IIP Statement

It is further assumed for compiling the IIP statement that:

- Country A-initial deposit at German Bank (G Bank): \$A million 500
- Initial trade credit and advances between country A (liability) and country B (asset): \$A million 200

	Position	Transactions	Exchange rate changes	Other price changes	Position
	Nov-30-16				Jan-2-17
Country A (\$A million)	300				300
Assets	500				1500
Financial derivatives	0				0
Other investment, currency and deposits at CBB	0	1000			1000
Other investment, currency and deposits at G Bank	500				500
Liabilities	200				1200
Other investment, currency and deposits CBB	0	1000			1000
Other investment, trade credit and advances (B)	200				200
Country B (\$B million)	240				240
Assets	240				1440
Other investment, currency and deposits at CBA	0	1200			1200
Other investment, currency and deposits at G Bank	0				0
Other investment, trade credit and advances (A)	240				240
Liabilities	0				1200
Financial derivatives	0				0
Other investment, currency and deposits CBA	0	1200			1200

	Position	Transactions	Exchange rate changes	Other price changes	Position
	Jan-2-17				Mar-31-17
Country A (\$A million)	300				300
Assets	1500				1500
Financial derivatives	0			143	143
Other investment, currency and deposits at CBB	1000				857
Other investment, currency and deposits at G Bank	500				500
Liabilities	1200				1200
Other investment, currency and deposits CBB	1000				1000
Other investment, trade credit and advances (B)	200				200
Country B (\$B million)	240				280
Assets	1440				1680
Other investment, currency and deposits at CBA	1200		200		1400
Other investment, currency and deposits at G Bank	0				0
Other investment, trade credit and advances (A)	240		40		280
Liabilities	1200				1400
Financial derivatives	0			200	200
Other investment, currency and deposits CBA	1200				1200

If the value of the financial derivative contract is paid into the CBA's deposit account, the recording will be:

	Position	Transactions	Exchange rate changes	Other price changes	Position
	Mar-31-17				Apr-1-17
Country A (\$A million)	300				300
Assets	1500				1500
Financial derivatives	143	-143			0
Other investment, currency and deposits at CBB	857	143			1000
Other investment, currency and deposits at G Bank	500				500
Liabilities	1200				1200
Other investment, currency and deposits CBB	1000				1000
Other investment, trade credit and advances (B)	200				200
Country B (\$B million)	280				280
Assets	1680				1680
Other investment, currency and deposits at CBA	1400				1400
Other investment, currency and deposits at G Bank	0				0
Other investment, trade credit and advances (A)	280				280
Liabilities	1400				1400
Financial derivatives	200	-200			0
Other investment, currency and deposits CBA	1200	200			1400

	Position	Transactions	Exchange rate changes	Other price changes	Position
	Apr-1-17				Jun-30-17
Country A (\$A million)	300				300
Assets	1500				1000
Financial derivatives	0				0
Other investment, currency and deposits at CBB	1000				1000
Other investment, currency and deposits at G Bank	500	-500			0
Liabilities	1200				700
Other investment, currency and deposits CBB	1000	-500			500
Other investment, trade credit and advances (B)	200				200
Country B (\$B million)	280				280
Assets	1680				1680
Other investment, currency and deposits at CBA	1400	-700			700
Other investment, currency and deposits at G Bank	0	700			700
Other investment, trade credit and advances (A)	280				280
Liabilities	1400				1400
Financial derivatives	0				0

	1400		Exchange rate changes	Other price changes	1400
	Position	Transactions			Position
	Jun-30-17				Sep-30-17
Other investment, currency and deposits CBA	300				306
Country A (\$A million)	1000				806
Assets	0			6.14	6
Financial derivatives	1000	-200			800
Other investment, currency and deposits at CBB	0				0.00
Other investment, currency and deposits at G Bank	700				500
Liabilities	500				500
Other investment, currency and deposits CBB	200	-200			0
Other investment, trade credit and advances (B)	0				0
Country B (\$B million)	280				271
Assets	1680				1400
Other investment, currency and deposits at CBA	700				700
Other investment, currency and deposits at G Bank	700				700
Other investment, trade credit and advances (A)	280	-280			0
Liabilities	1400				1129
Financial derivatives	0			8.59	9
Other investment, currency and deposits CBA	1400	-280			1120
			Exchange rate changes	Other price changes	
<i>Before the currency swap is unwound</i>	Position	Transactions			Position
	Sep-30-17				Dec-31-17
Country A (\$A million)	306				308
Assets	806				1312
Financial derivatives	6			6.21	12
Other investment, currency and deposits at CBB	800	200			1000
Other investment, currency and deposits at G Bank	0	-200+500			300
Liabilities	500				1005
Financial derivatives	0			4.82	5
Other investment, currency and deposits CBB	500	500			1000
Other investment, trade credit and advances (B)	0				0
Country B (\$B million)	271				269
Assets	1400				1687
Financial derivatives	0			6.75	7
Other investment, currency and deposits at CBA	700	700			1400
Other investment, currency and deposits at G Bank	700	-700+280			280
Other investment, trade credit and advances (A)	0				0
Liabilities	1129				1417
Financial derivatives	9			8.7	17

Other investment, currency and deposits CBA	1120	280			1400
			Exchange rate changes	Other price changes	
After the currency swap is unwound	Position	Transactions			Position
	Dec-31-17				Dec-31-17
Country A (\$A million)	308				308
Assets	1312				308
Financial derivatives	12	-12.35			0
Other investment, currency and deposits at CBB	1000	-1000			0
Other investment, currency and deposits at G Bank	300	+12.35-4.82			308
Liabilities	1005				0
Financial derivatives	5	-4.82			0
Other investment, currency and deposits CBB	1000	-1000			0
Other investment, trade credit and advances (B)	0				0
Country B (\$B million)	269				269
Assets	1687				269
Financial derivatives	7	-6.75			0
Other investment, currency and deposits at CBA	1400	-1400			0
Other investment, currency and deposits at G Bank	280	-17.29+6.75			269
Other investment, trade credit and advances (A)	0				0
Liabilities	1417				0
Financial derivatives	17				
Other investment, currency and deposits CBA	1400	-1400			0