

## **Module # 1 – Component # 1**



# **Foreign Exchange**

This is one component in the Investor Campus series on “Treasury Instruments”. This series explains and analyses all the aspects of foreign exchange and interest rate instruments, as well as their respective markets. It includes a Basic Foreign Exchange, a Money Market, a Derivatives and an Assets & Liabilities module.

### **Objectives**

To understand the fundamentals of foreign exchange markets, the basic foreign exchange instruments and how to use them.

### **Expected Outcomes:**

- To understand foreign exchange markets: their rationale, the role and objectives of the various participants as well as the economic factors influencing them.
- To understand fixed and floating rate systems.
- To understand the technical features of spot and forward contracts.
- To be able to quote or understand the quotation mechanism of spot and forward contracts.
- To understand how profits are made in foreign exchange markets, including speculation.
- To understand when and how to use forward contracts to hedge exposures.

## **1. FOREIGN EXCHANGE MARKET – OVERVIEW**

### **1.1 Definition**

The term foreign exchange (“FX” or “FOREX”) covers all claims denominated in a foreign currency, be they bank balances, bills of exchange, cheques or travelers cheques. Foreign exchange dealing, however, is concerned only with bank balances.

Bills or cheques become eligible for foreign exchange dealings only after the foreign drawee bank has credited them i.e. after they have been transformed into bank balances.

### **1.2 Participants**

The foreign exchange market is a vast worldwide network of buyers and sellers of currencies operating from approximately twelve major financial centers (principally in New York, London and Tokyo) and countless smaller ones. The participants range from banks, multi-national corporations down to tourists, who purchase small amounts of banknotes. It is a market where counter parties seldom see each other face to face, since it is linked by telephone, telex, and electronic transmission of information, where communication is rapid and to the point. The actual currency is seldom seen since it is transferred telegraphically from one account to another.

Market participants can broadly be categorized as follows:

- Central banks
- Market makers
- Brokers
- Clients

A **central bank’s** primary function is to be the lender of last resort. In other words, it may at times intervene to provide the foreign exchange market with liquidity, as when it needs to defend its currency against speculative attack, or in other cases, to extract liquidity from the open market when the local currency is considered to be too strong. Central banks also engage in open market operations, buying and selling currencies to defend particular levels of exchange rates. They may also use interest rates as a tool to move forward margins and discourage speculation.

**Market makers** refer to the major banks, which quote two-way prices. These are the players that respond to the factors that determine and influence the price direction of an exchange rate. The spread between the bid/offer quotes is generally how these banks’ profitability is determined.

**Brokers** act as intermediaries and do not trade for their own account. Essentially, they act as agents on behalf of market makers.

**Clients** can take many forms:

- **Financial institutions** – these are the fund managers of pension funds, insurance companies and unit trusts involved in international investment activities. According to the Bank of International Settlements (B.I.S) survey\* they accounted for 28 % of total FX volumes in spot, forward and swaps transactions in 2001. This was an increase of 8% over the previous survey for 1998. See the tables in annexure 1.
- **Hedge funds** – these are highly speculative vehicles, operating not only in the foreign exchange market, but also in the bond, shares, derivatives and commodity markets. Institutions or wealthy private investors fund them. The hedge funds industry is now estimated to comprise 6000 funds with USD 500 billion under management. The most notorious hedge fund is George Soros's Quantum Fund, which took on the Bank of England in 1992, and won. This led to Britain withdrawing from the ERM (Exchange Rate Mechanism).
- **Corporates and businesses** – these are commercial or industrial concerns that require foreign exchange for their trade activities or the hedging of their international exposures. The larger corporates operate treasury departments similar to banks. Their share of the FX market declined from 17% to 13% in 2001.

### **1.3 The interbank market**

The interbank market is the core of the foreign exchange market, and most of the dealing (59 %) is transacted through it. The interbank market is composed of commercial banks that deal with each other on a constant 24-hour basis.

### **1.4 Changing environment**

The growth in international trade, the globalisation of the world economies and the progress in information technologies have all contributed to the exponential rise in volumes traded. Total volumes are estimated to be well in excess of one trillion US dollars per day (1,173 billions in 2001).

### **1.5 Underlying transactions**

Whilst cross-border trade (imports – exports) was originally the main rationale for foreign exchange dealings, it now only accounts for a small percentage of total transactions. International investment flows; financial engineering and speculative trading are now the main sources of foreign exchange transactions.

\* Triennial Central Bank Survey, March 2002. “ Foreign exchange and derivatives market activity in 2001”

It must be appreciated that apart from holdings of notes and coins, which are insignificant in global terms, all currency holdings reside in their country of origin. Thus all US dollars are held in the USA, and all British pounds in the UK.

When foreign currency is bought or sold, there is no physical “migration” or “transfer” from one country to the other. Each currency will remain on an account in its country of origin. It is merely transferred from one account to the other, in that country, thus changing the title of ownership.

### **1.7 Currency accounts outside the country of origin**

The existence of US dollar or Japanese Yen denominated accounts or deposits at a London or Paris based Bank is only an apparent exception to that principle. Those accounts in fact reside in New York or Tokyo. They are merely *controlled* and *administered* from London in “shadow” accounts. These accounts are Euro – currency accounts (See below – Euro currencies).

### **1.8 Types of foreign exchange transactions**

Foreign exchange transactions may take the following forms:

- **Spot transactions** – the immediate exchange of two currencies. In order to allow time for the administrative processing of the transaction, however, the transfers in the respective countries will only take place 2 working days after the transaction took place. Hence the transaction is value dated T+2 to be effected in two business days time.
- **Forward/outrite** – an agreement to exchange two currencies at a specified date in the future at a fixed rate.
- **Swaps** – refers to a spot purchase/sale and a simultaneous and opposite sale/purchase in the forward market. This mechanism is not to be confused with the longer dated (1 year +) interest or currency swaps, which are different mechanisms altogether.

The terms “outrite” and “swap” while not being grammatically correct have arisen by custom and market convention. A spot contract is the basic form of foreign exchange. A forward contract is, technically, already a form of derivative, since it is “derived” from a spot price. The term derivative tends to be used, however, for the more complex forms of hedging instruments such as options, FRA’s, swaptions, interest rate swaps etc.

This brief deals with the spot and forward foreign exchange markets.

## **2. The Spot Market**

### **2.1 Definition**

The spot market provides immediate currency conversion:

Example:

A German importer needs to pay a supplier of equipment based in the USA. The invoice of \$200,000 falls due on 29 January. On 25 January, he buys \$200,000 from his bank at a rate of 90 US cents for 1 Euro. On 27 January, i.e. 2 days later, his bank account will be debited with 222,222 Euros.

Simultaneously, \$200,000 will be either credited to his USD account or transferred to the supplier's account directly.

Whether the rate on 27 January has changed or not is irrelevant. The deal rate is 90 cents to 1 Euro as fixed on 25 January.

### **2.2 Settlement**

Spot deals are settled 2 *business* days after the currency is bought or sold.

Example:

If, in the above example, the 25<sup>th</sup> of January is a Thursday, the deal will only be settled on the following Monday i.e. on the 29<sup>th</sup>.

If, in addition, the 29<sup>th</sup> is a bank holiday in the USA or in Germany, the deal will be settled on the 30<sup>th</sup>.

#### **2.2.1 Variations**

The following are variations around the value date:

- Same day value: seldom used, because of time zone restrictions. It can be used in an emergency (e.g. urgent payment), but it will generally result in a penalty rate for the customer.
- Overnight: a deal from today until the next business day.
- Tomorrow/next day (tom/next): a deal from the next business day until the spot date.
- Spot value date to the next: a deal from the spot date until the next business day.

- Spot/ a week: a deal from the spot date until a week hence.
- Spot/ fortnight: a deal from the spot date until a fortnight hence.

## **2.3 Buying and selling rates**

Foreign exchange quotations are governed by international conventions.

### 2.3.1 Abbreviations

Each currency has an internationally accepted code. This is based on so-called S.W.I.F.T. codes, or the Society for Wired Financial Transfers.

GBP	Great British Pound
USD	United States Dollar
JPY	Japanese Yen
EUR	Euro
ZAR	Zuid-Afrikaanse Rand (South African Rand)
ZWD	Zimbabwe Dollar
KES	Kenyan Schilling

### 2.3.2 Quotation format

The conventional manner in which quotations are done is explained as follows:

#### 2.3.2.1 “Big” and “small” figures

The spot rate between the US dollar and Japanese yen would be reflected as follows:

USD/JPY 123.85/90

The “big figure”, 123, is on the left. Only the decimals, 85 and 90, are quoted on both sides and are known as the “small figures”.

This quote means that the Bank will sell 1 US dollar for 123.90 yens, and buy 1 US dollar for 123.85 yens

A bank will normally quote a buy and a sell price (a “two way price”) in a currency.

In the example, the bank would therefore sell USD 1 million and receive 123.90 million Japanese yen. It would use 123.85 million Japanese to buy USD1 million. The net profit on this transaction would therefore be the difference between the two yen amounts i.e. JPY 123.900.000 – JPY 123.850.000 = JPY 50.000

### 2.3.2.2 Direct and indirect quotations

Currencies can be quoted on both sides, in other words each currency can be chosen as the unit, (1 or 100 if the currency is denominated in large amounts, like the Japanese yen, Italian Lira or Belgian francs before the Euro) the bid and offer rates being expressed in the other currency.

The unit is on the left side of the quote: GBP/USD 1.55/60 means that **one** pound sterling is sold for USD 1.60 and is bought for USD 1.55.

In a **direct quotation**, the foreign currency is the unit. The bid and offer rates are expressed in the domestic currency.

The reverse applies to the **indirect quotation**.

Market convention, however, is that some currencies are traditionally quoted as the unit, such as the pound and the Australia or New Zealand dollars.

The European parliament also insisted that the Euro should also be quoted as the unit.

Hence the quotation is EUR/USD 90.30/40 and not USD/EUR 1.107 / 1.17.

As the Euro and the Pound could not be quoted as the unit against each other, the British authorities accepted that the London interbank market would quote the Euro as the unit, but British banks would still have the option to quote the Pound as the unit in their dealings with customers.

### 2.3.2.3 The general rules are the following:

- The lower BID is ALWAYS on the LEFT HAND SIDE and the higher OFFER on the RIGHT HAND SIDE
- BID means the rate at which the dealer will BUY currency; OFFER means the rate at which the dealer will SELL currency. The bid figure is lower than the offer figure for the obvious reason that the bank has to make a profit.
- Quoting is always done from the QUOTING BANK'S point of view.

Bid and offer means the bank **providing the quote** is bidding and offering.

- It is ONLY in the spot market that the figure on the left hand side is always lower than the figure on the right hand side. (See below – forward contracts)

**Examples:** the table below is the copy of an actual Reuters page as seen on a Reuters screen.

**Reuters page showing major currencies quoted against the American dollar**

<b>1400</b>	<b>BARCLAYS BANK PLC LONDON</b>	<b>245 6895</b>	<b>TX</b>	<b>245 6899</b>		
<b>BAST</b>						
	<b>SPOT</b>	<b>1M</b>	<b>2M</b>	<b>3M</b>	<b>6M</b>	<b>12M</b>
	<b>BID/OFFER</b>					
GBP	1.5020/1.5025	-28/-26	-54/-53	-84/-83	-172/-170	-336/-333
JPY	121.70/121.75	-20/-19	-38/-37	-57/-56	-118/-116	-273/-271
ZAR	10.3400/10.3900	935/960	1800/1835	2720/2760	5350/5450	10500/10700

Note that:

1.) The Pound (GBP) is quoted as the unit against the USD: **One** pound is bought, by whatever bank makes the offer, for USD 1.5020, (on the left hand side) and sold for USD 1.5025 (on the right hand side).

If the dealer reading the screen wants to sell **USD** against GBP to the bank providing that quote, he knows that the exchange rate he will get for his USD is 1.5025, as the offer rate, which is the offer rate for one **Pound** from the quoting bank's point of view, is the **USD** sell (offer) rate for him.

2.) Japanese Yens, by contrast, are quoted against **ONE** USD. If the same dealer wants to, again, sell USD, his price is 121.70, as this is the price at which the quoting bank buys (bids for) USD.

This time, the price for selling USD is on the left hand side of the quote, because the USD is, this time, quoted as the unit.

## **2.4 Factors influencing spot rates**

While the fundamental laws of supply and demand for a currency influence its value over time, spot prices are influenced by differing assessments of the factors prevailing in the market at any given point in time.

### **2.4.1 Balance of payment**

A general rule is that the country with the stronger **balance of payments** position may have the stronger currency:

1.) Imports and exports are reflected in the **Trade Account**. A trade surplus is obviously a positive factor, but is no guarantee of a strong currency. South



Africa for example has traditionally shown a trade surplus, but the ZAR has steadily declined over the past 20 years.

2.) The trade account is carried over to the **Current Account** of the Balance of Payments, which reflects the services account e.g. dividend flows or payment for services, the “invisibles”. These payments may cause the Current Account to be negative.

3.) The rule of thumb is that a country with a deficit on the current account, however, can be financially stable if it has inflows through the **Capital Account**. These inflows can take the form of either portfolio flows through the interest that foreigners have in that particular country’s equities and bonds, or flows known as foreign direct investment flows. FDI inflows are generally known to be reliable and investment driven, while portfolio flows on the other hand are known to be volatile.

The USA, in the 1990’s is a good example of an economy balancing its huge trade and current account deficits with massive inflows of capital into Wall Street. The USD was extremely strong throughout this period.

4.) Finally, if both the Current Account and the Capital Account are in deficit, the rule of thumb can be extended further, in that a country may remain economically healthy, at least over the short term, if it has **gold and foreign exchange reserves** sufficient to offset these deficits. If not, it is likely that a currency may have to weaken sufficiently to attract exports, and therefore to restore not only the trade account, but also the current account to a better health.

#### 2.4.2 Short-term factors

The flows above are in turn influenced by a multitude of factors that market participants try and assess on a daily basis. The main ones are reviewed below. The list is by no means exhaustive, and in many cases a complex set of factors interlinks and may operate simultaneously to have an effect on a currency’s movements:

**Gross Domestic Product** measures the rate by which an economy is growing. GDP is the value of good and services an economy produces i.e. a country’s output. More recently, there has been a paradigm shift in that investment capital follows quicker growing economies. Previously, it was believed that higher interest rate returns attracted investment flows. However, higher interest rates suggest slower economic growth (GDP). This is of course a general rule, but it illustrates more broadly the importance of a country’s monetary and fiscal policies. While government performance may be measured in terms of GDP growth, central banks’ management of interest rates is generally measured against inflation, and in some instances by inflation targets that governments set. It is therefore important for fiscal and monetary policies to complement each other.

There are various yardsticks by which prices can be measured, one being **inflation statistics**. The GDP deflator for instance strips the impact exchange rate movements have on inflation statistics. There is also producer price inflation, and a number of measurements by which the prices at the next stage of the manufacturing cycle, the consumer level, are measured. Consumer price inflation can take the form of headline CPI that measures all levels of inflation, or core CPI which strips out the volatile influences of interest rates, food and fuel.

**Monetary and credit aggregates** are also monitored. In the case of monetary aggregates, a link is thought to exist between money supply and inflation data. Higher money supply data is thought to preempt higher inflation data, and the more inflation an economy has, the less will its comparative advantage be relative to that of its trading peers.

While the aforementioned are issues a currency may respond to, the list is by no means conclusive. Currency speculators and investors alike monitor **public debt and fiscal data**. Public debt in excess of 60% of GDP suggests a country may have to issue more debt to service interest payments on existing debt. Debt traps are by no means a phenomenon unique to developing African countries. Japan for instance has a debt trap, where government debt is 143% of GDP. This arose after successive policies of monetary easing failed to pull that economy from recession. Later, this was supplemented by a number of fiscal reform programmes, aimed at boosting the Japanese economy. The point being made is that developed economies, once emerging markets, can - and do - make mistakes in monetary and fiscal policies. In the case of fiscal data, the yardstick monitored is that budget overruns must be no larger than 3.0% of GDP. Anything larger suggest a country may either have to cut back on welfare, health, education, and infrastructural spending, or may have to hike taxes for it to balance its books.

Currencies will also respond one way or the other to **moral suasion** i.e. comments key government and central bank officials make, or even market rumours. But, often not understood, are the complexities surrounding **sentiment and psychological** issues, and the impact these have on currency movements.

Socio-political developments within a regional context may have an influence on exchange rates, especially the more liquid ones. There is a saying that “no chain is stronger than its weakest link”. This is an apt description for the impact poor neighbours may have on all economies connected to that country.

### 2.4.3 Emerging markets – “pegged” currencies

#### 2.4.3.1 Fixed and floating exchange rates

The Bretton Woods System of fixed exchange rates, which was implemented in 1949, collapsed in 1971 after confidence in the dollar was undermined: the

American currency ran aground after President Johnson inflated the U.S current account deficit in order to finance the Vietnam war. The dollar gold peg was discarded and the world's major currencies became free floating.

In Europe, the creation of the Euro fixed the exchange rates of 15 currencies against each other. The Euro itself, however, remains a floating currency against the non-Eurozone currencies.

Although the currencies of developed countries do fluctuate against each other, in sympathy with the international trade and capital flows, these movements do not have the magnitude, suddenness and traumatic effects of the variations seen in developing countries (Emerging Markets).

#### 2.4.3.2 Fixed rates and emerging markets

In an attempt to avoid the litany of problems associated with an ever-depreciating, volatile or vulnerable currency, these countries may decide to link the national monetary unit to the more stable currency of another country, essentially the US dollar or more recently the Euro.

The extreme form of “dollarisation” is to abolish the local currency altogether and replace it with the dollar (Euro). Examples of this are Panama (1904) Ecuador (2000), Guatemala and El Salvador (2001) for the USD and Croatia for the Euro.

Alternatively, the country may decide to retain its currency, but to tie or “peg” it to a stronger currency i.e. to maintain a fixed rate of exchange.

Examples of the latter are the CFA franc, linked to the French franc and the Estonian Kroon, linked to the Deutsche Mark. Both are now in effect linked to the Euro. The Argentinean Peso was pegged to the US dollar since 1991 until the end of 2001. Many Asian currencies were pegged to the USD before the Emerging Markets crisis of 1998.

For the sake of completeness, between the two extremes of free floating and “fully” fixed rates systems, the International Monetary Fund (IRM), further distinguishes between the following regimes:

- Fixed to a currency basket
- Limited flexibility: such as the now defunct European Monetary System's exchange rate mechanism, (ERM), and the so-called “quasi-peggers”.
- Managed flexibility.

#### 2.4.3.3 Implications and limitations of a fixed exchange rate policy

The analysis of the respective merits or shortcomings of these systems is beyond the scope of this module.

The following comments and observations, however, can be made:

As history shows, a pegged rate system is, per se, no panacea or cure for underlying economic problems.

The adoption of such a system is at best the expression by the authorities of a country of a *commitment* to strict monetary and fiscal policies. Once the “announcement effect” of this commitment has dissipated, however, the economic fundamentals will be at work again and put the stated or promised policies to the test.

The dollar peg will ultimately be unsustainable if the new system is not validated and supported by sound monetary, fiscal and budgetary policies, which are often absent from or difficult to implement in emerging market economies because, inter-alia, of their social implications.

Indeed, the very adoption of the fixed rate creates new challenges for an economy. Dollarisation has been compared to “the voluntary amputation of the finger of one hand, which increases the work which the other four, already severely disabled, must carry out”. “The false dilemma of dollarisation” by Alberto Acosta Nova Sociedad, No 172, March/April 2001).

Some of the problems experienced by countries having adopted a dollar peg regime are listed below:

- As seen many times, the USD denominated exports become increasingly uncompetitive. The local currency can no longer be devalued to restore competitiveness, which may result in business closures. This problem will be exacerbated by the appreciation of the USD itself against other major currencies, as it happened in the 1990’s.
- Imports, on the other hand are encouraged by the strong currency, which will also negatively affect local production. An example of this was the need for Argentina, a meat producer, to import cheaper meat from Brazil in the wake of the adoption of the USD peg.
- Monetising- budget deficits (printing money), is no longer an option. If drastic spending cuts are not implemented and/or tax collection increased, the only alternative is to resort to foreign borrowings, made possible, paradoxically, by the improved international credit rating brought about by the dollarisation itself!

This often leads to a debt trap. In Argentina, the initial reduction in debt after the introduction of convertibility was followed by it soaring to three times its size before monetary reform. Eventually, Argentina could not meet its debt commitments. See below, recent examples.

- Against the backdrop of a deteriorating trade balance, the fixed rate can be maintained as long as foreign investments and loans continue to be available to the country. When they dry up, the currency reserves will quickly decline and/or disappear. The currency will become overvalued, and a target for speculators, who will take advantage of its vulnerability. Speculative attacks will force the authorities of the country to let go of the peg.

The prime example, by contrast, of a successful introduction of a fixed rate regime is the Euro, which fixed, definitively, the exchange rates of 11 European currencies.

This very success demonstrates the importance of economic fundamentals and fiscal discipline: the adoption of the Euro was the culmination of a lengthy, complex process of economic convergence, based on fiscal harmonization and flexibility in terms of the factors of production. Similarly, every country seeking integration into the European Union, and the single currency, will have to satisfy the EU authorities that it does meet the required convergence criteria.

Emerging Markets have tended to reverse the process, adopting a fixed exchange rate apparently in the hope, or with the implied promise that it would instil fiscal discipline and somehow accelerate the modernization process of their economies.

#### 2.4.3.4 Recent examples

The mixed fortunes of fixed exchange rates policies in Emerging Markets are illustrated in the examples below, which also highlight the role of speculation

The most recent example of a spectacular failure of a pegged currency was the Argentine peso. Operating a dollarised economy, the intention was to have dollar inflows sufficient to support the peg. However, exports to America turned out to be small, and the pegged exchange rate consequently became overvalued. Fiscal problems revolving around Argentina's inability to service its debt payments – in dollars – consequently led to a speculative assault on the peso, forcing authorities to unpeg its currency. This unleashed inflationary pressures, itself an eroder of currency strength.

Emerging market contagion gained notoriety in 1998 when a number of South East Asian economies collapsed. Currency speculators reasoned that if these countries were growing at phenomenally high levels of GDP funded by large current account deficits, they could attack these markets confidently. They

also knew that the umbilical thread running in that region, where the success of one economy was dependent on the success of its neighbour, suggested that if one economy collapses, the other would also collapse in a domino effect. Thailand, Malaysia, the Philippines, Singapore, Indonesia were the predominant casualties. This had far-reaching consequences for other emerging markets, in South Africa and Latin America. Speculators, or proprietary traders as they are otherwise known, precipitated the first global market crisis involving almost every emerging market currency in 1998.

The technique used by speculators (Wall street banks and their European counterparts) was to take “short positions” in the local currencies: using the large credit lines available to them, they sold the local currencies in the forward markets, driving them downward.

The local central banks were “outgunned” not having enough currency reserves, or access to foreign lines, to counter those sales by buying back their own currencies, and had to let them fall. (See section 5.1 proprietary trading)

Speculators, however, stopped short of attacking the Hong Kong dollar pegged to the American dollar. This was not surprising, since the central banks of China and Hong Kong had combined foreign exchange reserves in excess of \$142 billion, and had advertised their intention of using some of this arsenal against currency speculators.

So what should a country do in instances where its currency is being attacked by speculators? Normally, a country's exchange rate is the price tag of its economy. It is a sign that economic fundamentals are either sound, or unsound. But it takes time to restore economic equilibrium to a point where economic health is restored, and the environment in the meantime can be a minefield, especially if it is being undermined by impatient currency speculators intent on making a quick return on their money.

A short-term solution may be to increase short-term interest rates, making it punitively expensive for currency speculators to fund short-term positions. High interest rates may have the effect of reversing an outflow of capital, and of protecting the domestic currency, but such monetary tightening cannot be held on to indefinitely for fear of strangling domestic economic activity. It is not unknown for a central bank for example to hike short-term rates from a few percentage points to rates in excess of 100%, as an attempt is made to squeeze speculators from the market.

A long-term solution may be to have a more closed economy; to peg the currency *provided there are reserves to defend it*, and to impose exchange controls that restrict the mobility of capital. The only known example of how this has worked successfully is Malaysia. After suffering bouts of speculative attacks on its currency – the Ringgitt – Malaysia pegged its currency in 1998, and imposed capital restrictions. Malaysian authorities insisted that demand

for foreign currency would only be met in instances where there was a trade-related commitment. Malaysians were given six weeks in which to repatriate their offshore holdings of Ringgits, or risk losing these balances. The economic environment subsequently became one that focused internally on economic growth and job creation.

### **3. The Forward Market**

#### **3.1 Definition**

A forward exchange contract (FEC) is an agreement to exchange two currencies at a specified date in the future at a fixed rate.

#### **3.2. Rationale**

There is no guarantee that today's spot rates will be prevailing at some date in the future. In fact, as seen above, spot rates can fluctuate every day, or even in the course of the same day.

These fluctuations are potentially damaging for anyone who takes on a commitment in a foreign currency e.g. traders, investors, lenders, borrowers and dealers in foreign currency.

##### **3.2.1 Examples**

a.) A French **importer** must settle a supplier in USD six months after the order is placed.

The cost of the goods is \$ 1,000,000. The goods will be received a week later and immediately re-sold for 1,200,000 Euros.

At the time the goods are ordered, the ruling spot rate is 1 EUR = 90 US cents. Based on this rate the importer would need 1,111,111 Euros to buy \$1,000,000.

His profit would be EUR 1,200,000 – EUR 1,111,111 = EUR 88,889.

Whilst any appreciation in the Euro against the USD during the 6 months period would reduce the cost of the goods to the importer, the depreciation of the Euro to 80 US cents would increase the cost of the goods to 1,250,000 Euros. Should this happen, the importer would incur a loss of EUR 50,000 on the transaction.

b.) A British **exporter** has sold \$ 1,000,000 worth of goods to the US. The payment is due in 180 days. The profit margin is 10%. If during this period, the British Pound appreciates by 20 % against the USD, the exporter will incur a loss on this transaction

The purpose of forward contracts is to limit the risk of adverse exchange rate fluctuations.

### **3.3 Mechanism**

The forward contract or “cover” provided by the Bank will guarantee to the customer the future rate of exchange at which the currencies will be bought or sold.

In providing this guarantee of a future fixed price, the Bank is not taking a view on the future. It simply does *today* what the customer needs to do in the *future*:

The Bank will take the following steps:

#### 1.) Spot transaction

The Bank will buy, on day 1, the USD that the importer only requires 180 days later.

#### 2.) Placement of currency on deposit

Assuming that USD deposits offer an interest of 1 % per annum, the Bank will only need to buy USD 995,025, as this amount, placed for 180 days at 1% will generate interest of USD 4,975, so that capital plus interest = USD 1,000,000.

#### 3.) Borrowing

In order to purchase the USD 995,025, the bank had to borrow EUR 1,105,583 at the then prevailing spot rate of EUR/USD 0.90.

Assuming that the interest on this loan is 5 % per annum, the amount the bank must repay after 180 days is EUR 1,133,223.

#### 4.) Delivery by the bank and repayment by the customer

On day 180, the bank will claim this amount from the importer in exchange for the USD 1,000,000, which will be used to pay the exporter.

The **forward rate** is EUR/USD 0.8824, as EUR 1,133,223 are required to purchase USD 1,000,000 (USD 1,000,000: EUR 1,133,223 x 100 = 0.8824)

The difference between the spot rate on day 1 and the forward rate on day 180 is simply the difference between the interest rate paid by the Bank on the Euro loan and the interest it received on its USD deposit (5% - 1% = 4% for 180 days or 2%) **translated into the exchange rate.**

### **3.4 Forward market and interest rates**

The above implies the following:



#### 3.4.1 Forward rates and future spot rates

Forward rates have nothing to do with future spot rates. Forward rates are **not**, as it is sometimes wrongly understood, an indication or expectation of the future level of spot rates.

In constructing a forward contract as seen above, the Bank takes no currency risk whatsoever. The Bank's only risk is the inability of the counter party (the importer in the example) to honour its leg of the transaction. This is a credit risk. (See below –risk section 7.)

#### 3.4.2 Variables determining forward rates

The forward rate is the spot price ruling on the day the forward contract is booked, adjusted by the interest rate differential between the 2 currencies involved. Any fluctuation in any of those 3 variables will affect the forward prices quoted by banks.

#### 3.4.3 Foreign exchange and money markets

This intricate relationship between interest rates and forward rates explains the close interaction of the money market (local currency) and foreign exchange desks in the Banks' dealing rooms.

#### 3.4.4 Implications for buyers and sellers of currency in the forward market

A currency with a *higher* interest rate will require, in the forward market, a *larger* amount of units than it would require in the spot market to buy the same amount of foreign currency.

In the above example, the Bank had to pay a higher interest on the Euro loan than it received on the USD deposit. More Euros (1,133,223 VS 1,111,111) are therefore needed by the importer to buy forward the same amount of USD 1,000,000.

The interest rate differential is against the Euro (5% vs. 1% for the USD) i.e. **against the importer.**

Conversely, if a Euro based *exporter* sells forward the USD he is expecting from his sales, he will get *more* Euros in the forward market than he would have in the spot market.

He owns and sells forward a currency (USD) with a lower interest rate and **benefits** from the interest rate difference. In the above example, the Bank would borrow USD at 1% and place the Euros at 5%, generating a surplus of Euros of 4% over the 180 days period.

#### 3.4.5 Premium versus discount

In both cases, buying and selling against the USD, the amount of Euros involved in the forward market is larger than in the spot market.

This is why:

**Currencies with a higher interest rate are said to be trading at a premium in the forward market.**

**Currencies with a lower interest rate are said to be trading at a discount.**

Note that:

The terms premium and discount only apply between 2 specific currencies: the same currency can be at a premium over one currency and at a discount to another.

(See the USD vs. the Pound and the Yen in the example in section 3.6.2)

The currency “trading” at a discount or premium is the one quoted on the right side of the quote i.e. it is the currency in which the bid and offer is expressed.

Premiums and discounts also apply to the way the forward contract rates are quoted. (See below 3.6 Quotation of forward prices)

### **3.5. Forward contracts markets**

The forward markets, at least in the currencies of developed economies, have become extremely large and liquid: in April 2001, FEC’s worth USD 131 billion and SWAPS worth USD 656 billion were traded per day – See table in annexure 1.

As a result it is no longer necessary, indeed feasible, to borrow, convert and invest the currencies bought and sold. There is in fact always an opposite, matching transaction available for the issuer of the forward contract (the bank) to cancel out its currency risk.

This means that the vast majority of today’s forward contracts are no longer created via the “money market route”, which requires actual movements of liquidity and is therefore a more cumbersome way of creating a forward contract. Banks now simply issue an undertaking to buy/sell a currency at a fixed rate in the future. They will manage/eliminate their risk by taking opposite instruments in the market.

That said it is essential to understand that:

- 1.) The forward market prices are still dictated by the interest rates differentials. Should they diverge from the interest rates differentials, e.g. become more expensive to customers, alert traders can revert to the money market route and take advantage of the difference between the foreign exchange and money market routes. This, over time will inevitably force the forward rates back in line with the interest rate differential i.e. the money market route.

This mechanism is a form of **arbitrage**. (See below – How money is made in the currency markets).

2.) The above is particularly true of OECD markets, which are extremely liquid and unregulated. In markets influenced by exchange control regulations or central bank intervention, disparities between the 2 “routes” can occur or indeed be deliberately created.

As an example of the latter, the South African Reserve Bank used to reduce the cost of forward cover in order to make USD borrowings fully covered more attractive than borrowings in the local currency. This would prompt borrowers to borrow USD fully covered, which boosted the currency reserves of the country.

3.) In some countries with little liquidity, the money market route is still the only way to construct forward contracts.

### **3.6 Quotation of forward prices**

#### 3.6.1 Value dates

Value dates for forward contracts can be for any future date, but certain conventions are observed in the market. Normally, forward rates are quoted for a number of fixed months ahead of the spot value date (1, 2, 3, 6 and 12 months). If the forward value date calculated on this basis is a non-business day in one of the currency centers involved, the value date is postponed until the next business day. Value dates that fall on days other than straight months are referred to as “broken dates”. Value dates up to two weeks are known as short dates and are quoted in the same way as forwards, with margins adjusted against the spot rate (refer to short dates in “The spot market” – Section 1.1).

#### 3.6.2 Quotation format

As explained above, the forward exchange rate is calculated by applying a margin to the spot exchange rate. This margin is referred to as a “premium” or “discount”, and is the difference between the forward rate and the spot rate at the inception of the contract. It reflects the difference in interest rates between the two currency markets. Whether the margin will be a premium or a discount i.e. added to or subtracted from the spot rate depends, as seen above, on the interest rate of the currency.

Moreover, if the currency expressed as the unit is the currency with the lower interest rate, the bid side of the quote will be a smaller number than the offer side.

Conversely, if the interest rate is higher, the number on the bid side of the quote will be a larger number.

Examples:

**Reuters page showing major currencies quoted against the American dollar**

<b>1400 BARCLAYS BANK PLC LONDON 245 6895 TX 245 6899</b>						
<b>BAST</b>						
	<b>SPOT BID/OFFER</b>	<b>1M</b>	<b>2M</b>	<b>3M</b>	<b>6M</b>	<b>12M</b>
GBP	1.5020/1.5025	-28/-26	-54/-53	-84/-83	-172/-170	-336/-333
JPY	121.70/121.75	-20/-19	-38/-37	-57/-56	-118/-116	-273/-271
ZAR	10.3400/10.3900	935/960	1800/1835	2720/2760	5350/540	10500/10700

1.) The GBP/USD forward margins (1 to 12 months) are shown with a minus sign.

This means that they must be subtracted from the spot rate to arrive at the forward rate for that period.

Example: the 3 month GBP/USD bid rate is  $1.5020 - 84 = 1.4936$ . In other words, a

US importer would have to pay 1.4936 USD to buy one Pound 3 months in the future. The same amount would cost him USD 1.5020 today i.e. cost him MORE.

This is because the currency he owns attracts a lower interest rate than the currency he is buying (GBP). His currency trades at a discount, he has to pay a smaller amount in the future than today.

Also, the margin (discount) on the bid side is a larger number (84) than the margin on the offer side (83). This is because that margin is *subtracted* from the spot rate: Subtracting a larger number on the bid side will give a lower figure on the bid side than the offer side, which is of course the correct quoting format for the bank to make a profit, in this case of 1 US cent per GBP.

2.) The USD/YEN forward margins are also reflected as a discount, although this time the USD is the unit i.e. on the left side of the quote.

This is because the YEN interest rates are even lower than the USD rates.

3) The USD/ZAR margins are shown as a premium. They have to be added to the spot price, as the ZAR has a (much) higher interest rate than the USD.

### **Practical advice**

It is the interest rate of the currency on the *right* side of the quote that determines whether forward margins have to be added or subtracted. If the interest rate of the currency on the right side is higher than that of the

currency on the left side, it is a premium (added). If it is lower, it is a discount (subtracted).

### **3.7 Cancellation, extension and early draw down**

#### **3.7.1 Cancellations**

Two situations can arise: either the underlying hedged transaction is cancelled, or the user regrets his decision to hedge and wishes to cancel (close out) the contract.

##### **3.7.1.1 Cancellation of the underlying transaction**

###### **Example:**

A South African exporter receives an order from Australia for a thousand cars. The cars will be delivered 90 days later. Payment is expected 90 days from shipment date.

The invoice is in USD, for an amount of USD 1,000,000. The South African Rand is expected to strengthen against the USD over that period, however, and to avoid a loss, the exporter books a forward contract: he sells (forward) to his bank the USD 1,000,000 that he expects to receive in 180 days.

The rates are as follows:

Spot on day 1: USD/ ZAR: 10.00/50

Forward rate: USD/ ZAR: 10.50/90

The forward rate assumes that the US interest rate is 3 % and the South African rate 13%. The interest rate difference is 10% per annum. The period is 180 days.

Two months after placing the order i.e. on day 60, the Australian importer cancels the transaction.

At the time of the cancellation, the spot rate has moved to USD/ZAR: 15.00/50, in other words the Rand, contrary to expectations has considerably weakened against the USD.

The Bank will cancel the forward contract by creating an opposite contract maturing on the same date as the initial one i.e. on day 180.

On day 60, the bank will therefore sell (forward) USD1,000,000 to the exporter for maturity day 180.

The forward price is USD/ZAR 15.75/95. This price assumes that SA interest rates were increased from 13% to 18% to defend the currency. The interest rate differential has thus widened to 15%.

On day 180, the following settlement will take place:

1.) Dollar leg

The Bank has originally bought USD 1,000,000 from the customer. It has also on day 60, sold him the same amount of USD 1,000,000. The two “dollar legs” offset each other. Nothing is due by either party.

2.) Rand leg

The bank has bought USD 1,000,000 at a rate of 10.50 ZAR for 1 USD and therefore owes the customer ZAR 10,500,000.

The bank has sold USD 1,000,000 at a rate of ZAR 15.95 to the USD and therefore must receive ZAR 15,950,000 from the customer.

The net position is that the customer owes the bank i.e. has lost ZAR 5,450,000!

If the spot rate had improved from 10.00 to 7.00, the customer would have made a profit.

3.7.1.2 Change in hedging strategy

If, during the life of the forward contract, the spot rate moves in such a way that the client regrets his decision to hedge, the FEC may also be cancelled, as shown above, at a profit or a loss to be settled on maturity date. The underlying commercial transaction remains however. The hedge has been eliminated, and the client will be able to access the better spot rate. He will only benefit from his decision to cancel the FEC, however, if the rate *continues* to move *further* in his favour.

Example:

Let us assume that in example 3.7.1.1, the order is not cancelled, but the exporter decides to close out the FEC because he sees the ZAR weakening against the USD.

If he does this on day 60, the effect of the cancellation will be the same: he will owe the bank ZAR 5.450.000 on day 180.

He is still, however, going to receive USD 1,000,000 on day 180. This time, if the spot rate does not change for the next 120 days, he will receive ZAR 15,000,000 instead of the ZAR 10,500,000 he would have received if he had not cancelled the FEC.

On balance, however, he will still have lost ZAR 950,000 (ZAR 15,950,000 – ZAR 15,000,000 = ZAR 950,000). This is because he has to pay a 15 % (95 cents) premium to buy back the USD he had sold forward to the Bank.

He will only benefit from his decision if the ZAR *continues* to decline *further* than the break-even rate of USD/ZAR15.95/60.

Let us note that closing out the original forward in order to take, immediately, another forward, because it is based on a better spot rate, is a futile exercise,

since the two new forwards will simply cancel each other. The customer will lose the spread.

#### 3.7.1.4 Conclusion

Closing out forward contracts as part of a management strategy will only make sense if the customer is convinced that spot rates will move in his favour past the break-even rate as calculated above.

#### 3.7.2 Extensions

##### 3.7.2.1 Rationale

Although the bank's customers will in principle try to make the maturity date of their forward contracts coincide with the settlement of the underlying transactions, in practice this may be difficult to achieve.

Shipments, for example, may be delayed by strikes in the exporter's country, so that the payment will have to take place after the initially anticipated date.

To accommodate the importer, an "extension" can be arranged by the bank to meet the new maturity date.

This is done through a "swap", which as explained earlier is the simultaneous and opposite buying and selling of the currencies in the spot and forward markets.

##### 3.7.2.2 Example

An importer initially expected to pay USD 1,000,000 to an exporter on 30 June.

The 90 days forward contract was at a rate of ZAR/USD 10.50/90, which means that he was going to pay ZAR 10,900,000 to the bank in exchange for the \$1,000,000.

The initial spot rate was 10.24/63, the interest rate differential being 10% (ZAR 15% - USD 5%).

Due to shipment delays, the payment will now be postponed to 30 September.

Rates on 30 June are as follows:

The spot rate is 12.00/30 meaning that the ZAR has dropped significantly against the dollar since the forward contract was booked. The new forward rate, still based on interest rates of 5% (USD) and 15% (ZAR) is 12.30/61. Note that we assume, for simplicity's sake, that interest rates have not changed, but, in real life, they might have.

The following transactions will take place:

1.) On 30 June the original forward contract will be cancelled by way of an opposite spot contract:

The bank will buy back the \$ 1,000,000 it had to deliver on 30 June.

a.) USD leg:

No USDs have to change hands. The parties owe each other the same amount of USD.

b.) ZAR leg:

In terms of the original FEC, the customer owed the bank ZAR 10,900,000.  
In terms of the new spot contract, the bank owes the customer ZAR 12,000,000.

The bank will therefore have to credit, on 30 June, the customer's account with ZAR 12,000,000 – ZAR 10,900,000 = ZAR 1,100,000.

Note that if the ZAR had strengthened against the USD, the customer would have OWED the bank money. (See below – Credit risk section)

2.) Again on 30 June, however, the bank will provide the customer with a new FEC.

The new contract will be based on the spot rate prevailing on 30 June for the 3 months period to 30 September, which is USD/ZAR 12.30/61

On 30 September the importer will owe the bank ZAR 12,610,000.

The net amount paid by the customer is ZAR 12,610,000 – ZAR 1,100,000 = ZAR 11,510,000. The difference between the amount due on 30 June (ZAR 10,900,000) and the amount finally paid is ZAR 610,000, which is the premium (61 cents or 10% interest differential) for the additional 3 months. There is no negative impact resulting from the dramatic depreciation in the ZAR against the USD.

The implications of the above are that:

a.) What is referred to as an “extension” is in fact, technically, the cancellation of the existing contract and the creation of a new one.

b.) Although there are liquidity implications on the extension date, (unless the spot rate has not changed which would be purely coincidental), neither the Bank nor the customer is affected by the extension:

- For the bank, the transaction is currency neutral. In fact *all swaps are* since the same amount of currency is bought and sold.



- For the customer, there is no foreign exchange loss or gain, since what he loses on one leg (spot) he recovers in the other (forward), or vice versa.  
There are only cash movements.
- The importer (exporter) will still import (export) the goods at a cost determined by the original contract, although the new forward rate is different:

### 3.7.3 Early drawdowns

#### 3.7.3.1 Rationale

An early draw down occurs when the underlying transaction takes place before the maturity date of the forward contract.

#### 3.7.3.2 Example

Let us assume that an importer expected to receive a shipment on 30 June and takes a 90 days FEC on 31 March.

Details are as follows:

Shipment value:	USD 1,000,000
Spot price	USD/ZAR 10.24/63
Forward price 90 days	USD/ZAR 10.50/90
ZAR 90 DAY rate	15 %
USD 90 DAY rate	5 %
Amount due to the bank on 31 March	ZAR 10,900,000.

He, however, receives the goods on 30 April and has to pay C.O.D. This time, the bank will also enter into a swap, being a spot deal on 30 April and a same date FEC for value 30 June:

#### 1.) Spot leg

On 30 April the bank will sell \$1,000,000 SPOT to the customer, which he will use to pay away the supplier. If we assume that the spot rate on that day is USD/ZAR 12.20/50, the importer will pay the bank ZAR 12,500,000. This is more than the amount owed in terms of the original FWD contract (ZAR 10,900,000 at the FWD rate of 10.50/90)

#### 2.) Forward leg

The bank will however buy the same USD 1,000,000 forward for value 30 June.

The forward rate will be USD/ZAR 12.40/71, assuming that the interest rate differential is still 10% as it was on 31 March, the inception date of the initial FEC.

On 30 June the following will take place:

a.) USD leg

No USDs have to change hands since both the bank and the customer owe the same amount to each other.

b.) ZAR leg

The customer owes ZAR 10,900,000 to the bank.  
The bank owes ZAR 12,400,000 to the customer.

The bank owes and pays a net amount of ZAR 1,500,000 to the customer.

3.7.3.4 Comments

1.) The customer paid ZAR 12,500,000 and received ZAR 1,500,000. The cost to him was a net payment of ZAR 11,000,000, which is ZAR 100,000 more than the initial FEC amount of ZAR 10,900,000.

**This is still, however, much better than a payment of ZAR 12,500,000 at the spot rate of 12.50 prevailing on 30 April.**

In fact, we have assumed in the example that the Bank is taking a healthy profit of ZAR 310,000 on the FEC leg of the swap transaction.

If the bank had taken no spread on the deal, the importer would have received ZAR 1,810,000 and the net payment would have been ZAR 10,690,000 i.e. a difference in his favour of ZAR 210,000. This is because the forward points for the 60 days period between 30 April and 30 June are in his favour: he sold USD to the bank, and recouped, for that period, the premium he had to pay in the first FEC.

2.) The example assumes that the interest rate differential on 30 April was still 10%. Should it have widened e.g. to 15 %, the importer would have paid less, since on 30 April he is selling forward (for 2 months) a currency (USD) with a (much) lower interest rate.

The reverse would apply if the interest rate gap had narrowed.

3.) Should the ZAR have strengthened against the USD, instead of weakening, the customer would have OWED the bank a cash settlement on 30 June. The risk is then that the customer cannot meet this obligation. (See below – risk section).

## Conclusion

Early drawdowns will not, per se, alter the cost of the original FEC. The user is still protected by the original FEC rate, based on the original spot rate.

## **4. Using Forward Contracts**

### **4.1 Categories of foreign exchange risk**

Foreign exchange risk or exposure can take different forms, usually grouped in three categories:

#### 4.1.1 Transaction risk

Transaction risk arises whenever a commitment is made for a foreign currency *cash flow*(payment or receipt).

Typically, the transactions are:

- Import or export transactions, as seen above.
- The repayment of the capital and interest of a foreign currency denominated loan.
- Payment or receipt of dividends

#### 4.1.2 Translation risk

This risk arises from the need for a company with assets and liabilities in foreign countries to prepare consolidated accounts in the home currency. Unlike the transaction exposure above, translation exposure does not involve cash flows. It is only a reporting issue. Accordingly, it is also referred to as “accounting exposure”.

#### 4.1.3 Economic exposure

This notion refers to the impact future foreign exchange rate fluctuations may have on a firm's future profitability and its current value. This is a very broad concept as economic risk can take many forms. While transaction risk refers to *already contracted*, near term transactions, economic risk looks beyond those.

Example:

A Japanese manufacturer of audio equipment exports primarily to the USA. His main competitors are Korean exporters. The Japanese exporter is exposed to a depreciation of the Korean Won against the Yen and the USD, which would make Korean exporters more competitive in the USA.

Note that the Japanese exporter only has a USD/YEN transaction risk, as he is not dealing in Wons. The exposure to the Won is only an economic risk.

## **4.2 Use and limitations of forward contracts**

### 4.2.1 Advantages of forward contracts

The forward purchase and sale of currency can be done in precise required amounts to the precise required date of cover, and no further maintenance or other cash flows (premium or fees) is required. The market is highly liquid and market transparency (in terms of pricing) is very high. Almost any currency pair can be transacted sometimes for as long as 20 years in certain centers.

### 4.2.2 Disadvantages

Forward contracts are simple but fairly inflexible instruments:

4.2.2.1 They imply, by definition, the physical delivery of liquidity. If the hedged transaction does not materialise they can be cancelled, but only at a potential loss (See section 3.7.1). Forward contracts therefore are used to hedge *committed* cash flows i.e. transaction risks as defined above, as opposed to contingent or uncertain exposures.

Currency options, by contrast, can be allowed to lapse at no cost but the premium.

They are better suited to the hedging of risks with an element of uncertainty.

Example:

In the above example in 4.1.3, the Japanese exporter could take a Yen/Won currency option to protect himself against the impact of a Won depreciation against the Yen.

4.2.2.2 On maturity date, the user of the FEC has no “walk away” option, even if on an ex-post basis, the decision to hedge turned out to be the wrong one. The customer will have incurred an opportunity cost (See below). The purpose of a currency option is precisely to offer, albeit at a cost, the protection of a hedge *and* the right to let it lapse if the then prevailing spot rate is more favourable.

4.2.2.3 As seen in section 3.7.3, the FEC user remains affected by his initial decision to take a FEC if he changes his mind during the life of the FEC.

4.2.2.4 Once an FEC is in place, it cannot be unwound without some cash flow movement: closing out, extending, early drawdowns or cancellations, can have significant cash flow implications and require a large degree of administrative ability by the company.

### **4.3 Hedging decisions**

This module deals only with forward contracts. Hedging techniques are reviewed more comprehensively in the derivatives module. Irrespective of the sophistication of the hedging instruments, however, some fundamental issues are common to the use of all hedging instruments.

This section looks at the issues involved in the decision making process and their implications:

#### 4.3.1 Security versus cost

Like any form of insurance, forward contracts offer security, but at a cost.

##### 4.3.1.1 Cost of hedging

The bank providing the forward contract will in principle charge for it, as per the quoted “spread”. This is not however a major issue, since it would probably charge a similar amount on the spot transaction if the client decided not to use a forward contract.

The main issue is the **opportunity** cost that the client thinks he might incur by taking forward cover:

Let us assume an importer of high-fi equipment located in a country with a high interest rate environment such as South Africa. The equipment is imported from Japan, where the interest rate for 180 days is 1%. The rate in South Africa is 13%. For a 180 days period the cost of forward cover is 6% (flat) of the cost of imports from that country.

So, by taking forward cover, the importer is *certain* to lose 6% of profit margin. Conversely, the ZAR will have to lose at least 6% of its value for the forward cover to “break even”. If it loses more, the importer has avoided an even bigger loss, if it loses less, he would have been better off without cover.

The high interest rate environment might indeed discourage an importer from taking forward cover, particularly if his profit margins are severely dented by the FEC’s premiums. The very fact, however, that interest rates are high may indicate that the currency is vulnerable, which would make this decision a difficult one.

A South African gold exporter would be in the opposite situation: by hedging, he is certain to lock in an additional 6% profit on sales. He will incur an opportunity cost if the ZAR depreciates by more than 6 %.

##### 4.3.1.2 Understanding and quantifying the risk

Many companies, however, regardless of the potential cost are of the view that they should concentrate their energies on their line of business, e.g.

selling shoes, and make money from that activity, and not allow any form of exchange risk to interfere with the budgeted profits.

They will therefore systematically take forward cover as soon as a foreign exchange exposure arises.

At the other extreme of the spectrum, companies may opt to do nothing i.e. take no cover at all and be exposed to the vagaries and fickleness of exchange rates.

If this course of action, or inaction, is the result of ignorance, inertia or recklessness it may be courting disaster, as it will probably be too late when the company realizes that a loss has been incurred.

Other companies, however, although fully aware of the exposure(s) may decide to run open positions. Indeed, many (large) corporations view their treasury operations as separate profit centers. They are staffed, however, with skilled, dedicated specialized staff, which can actively measure and manage their exposures.

Although a certain amount of risk taking, in exchange for enhanced returns, may appeal to some companies, it is reasonable to assume, however, that foreign exchange exposures should be eliminated if they pose a threat to the very existence of the company.

Based on this assumption, a reasonable approach to hedging decisions is to identify, and quantify, **the sensitivity of the profits and balance sheet of a company to foreign exchange fluctuations.**

This process is best illustrated through case studies.

Here are, however, a few examples:

a.) A company imports one hundred percent of its turnover from the USA. Clearly, the exchange rate is an important cost factor. If the local currency is volatile, *and* the demand for the products price sensitive, the cost of forward cover is probably worth incurring even if it reduces profits.

b.) If the same business re-exports its products to a hard currency destination, it may decide to take no cover at all, on either side, as the exports offer a “natural hedge”.

c.) If a business buys and sells exclusively in local currency, borrowing in foreign currency, uncovered, in order to access lower interest rates is a questionable decision, particularly if the local currency is vulnerable and a foreign exchange loss on the open exposure could compromise its existence.

## **5. Bank Treasury Earnings**

Profits generated by treasury operations include:

- The margins (if any) taken by currency traders on interbank transactions
- Speculative position taking
- Arbitrage
- The margin the client dealer takes on the price obtained from the interbank trader

The emphasis placed on any of these will vary among institutions.

### **5.1 Trading**

Market making is basic to foreign exchange trading in the OTC (Over The Counter) market.

The willingness of market makers to quote both bids and offers facilitates trading and contributes to liquidity in the market.

An institution can be a market maker because it believes that it can earn a profit on the spreads between buying and selling prices. But it may also see advantages in that the market making function can broaden the range of banking services that the bank can offer to clients. In addition, it can give it access to market information and market liquidity that are valuable in its other activities.

The rates quoted by market makers are influenced by the current quotations in the market, the latest trends and expectations, whether the bank is long or short in the currency involved, and views about the market.

Market making tends to be short-term and high volume, with traders concentrating on earning small margins on transactions, or at least most of them.

Trading is concentrated among a few large players: in both London and New York, no more than 10 banks trade more than 50% of the FX turnover.

### **5.2 Proprietary trading**

#### **5.2.1 Definition**

Dealers also trade foreign exchange as part of the bank's proprietary trading activities, where the bank's capital is put at risk on various strategies. There is no difference between proprietary trading and speculation.

Whereas market making is usually reacting to other people's requests for quotes, proprietary trading is proactive, taking a view to realize a larger profit, in percentage points rather than basis points:

Proprietary traders generally analyse the economic fundamentals of a particular currency before taking a view on it. They buy a currency, thereby taking a “**long position**”, in the hope that it will appreciate or sell a currency, taking a “**short position**”, in the hope that it will depreciate (See below).

Some institutions put sizeable amounts of their own capital at risk for extended periods.

The globalisation of financial markets, and the ability of banks or hedge funds to raise large amounts of money, has made it possible to take on central banks and move the currency of a country in the direction that will result in a profit for the speculators.

These market participants are known to attack currencies with the weakest link.

The examples of Argentina and Asian markets have already been mentioned. Other examples worth mentioning are the UK and Eastern European countries

In 1992, the British pound came under attack by hedge fund manager George Soros, after the pound was thought to be overvalued against the German mark, within the Exchange Rate Mechanism. Soros, who sold the pound, (See below, mechanics) took on the Bank of England and won, when Britain withdrew from the ERM that year.

In 1997, speculators undermined many currencies in emerging Eastern Europe that were pegged either to the dollar or to a basket of currencies that predominantly included the German mark. Currency pegs are known to be weak, especially if their central banks do not have sufficient foreign exchange reserves to defend its pegged value. Pegged currencies generally do not experience problems in situations when foreign exchange flows into their market. In these instances, central banks sterilize dollar liquidity (in other words, buy dollars) to prevent their own currency from being overvalued. Countries with overvalued currencies have a tendency to attract imports. This may create problems where countries are trying to become self-sufficient.

## 5.2.2 Mechanics

### 5.2.1.1 Using the spot market

If a trader believes that the USD is going to appreciate against the local currency e.g. the South-African Rand, he can borrow in that currency, convert the ZAR into dollars and wait for the dollar to appreciate. When the ZAR loan



matures, he will then, if his reading of the market was right, buy back Rands to repay the loan plus interest and retain a profit.

Example

The ruling spot rate is USD/ZAR 9.70/00. The trader expects the ZAR to decline to USD/ZAR 12.00.

He borrows ZAR 100million for 180 days at a rate of 15% to buy USD 10million spot. He places the USD 10million on deposit at a rate of 5%. He is long in dollars and short in Rands.

The ZAR does decline to ZAR12.00 .On maturity of the ZAR 100million loan he sells the USD 10, 5million for ZAR126 million.

He has made a profit of ZAR126million less ZAR 107,5Million = ZAR 18.5 million.

If the ZAR had appreciated to USD/ZAR 9.00, he would have made a loss of ZAR 107,5 million – ZAR 94,5 million = ZAR13 million.

NB: The example shows the importance of interest rates: the higher the ZAR interest rate, the more the ZAR has to depreciate for the trader to make a profit. This is why hiking interest rates is used by central banks as a weapon against speculation.

5.2.2.2 Using the forward market

In the above example, the trader is using liquidity (borrowing ZAR and placing USD).

As explained in section 7, banks calculate the credit risk of foreign exchange lines as a percentage of the nominal amount of the forward contracts booked under these lines. Percentages vary from bank to bank, generally between 5% and 20%.

This means that with available liquidity of USD 500million for example, a hedge fund can secure lines and enter into transactions of up to USD 5 or 10 billion. As mentioned previously, the Hedge fund industry is estimated to have grown to USD 500 billion. They are therefore, like banks, capable of mobilizing enormous amounts of money.

This “multiplier effect” gives speculators the ability to “outgun” central banks in terms of the amounts of currency they can mobilize.

Example:

Let us assume that the currency of an emerging market country, the “LC”

is pegged against the USD in a ratio of one to one (parity).

The country is running a large current account deficit and borrows heavily in the foreign debt markets. Currency reserves are low. The peg looks vulnerable to speculators

Speculators will build short positions in the local currency by selling it forward, in the hope that the peg will be abandoned and the local currency devalued.

Speculator “S”, for example, sells 5 billion LC 's 180 days forward in exchange for USD.

The risk involved in this transaction is limited:

- If the peg is maintained “S” will incur no exchange loss: On delivery date, he will pay USD 5 billion, at a rate of one to one, to buy the 5 billion LC' s which he must deliver according to his forward contract. In exchange, he will receive the same amount of USD from the counter party.
- If the peg is abandoned and the rate falls to 0.5 to one, for example, “S” will have to pay only USD 2,5 billion to buy the LC 5billion he has to deliver on his forward contract. He will however receive USD 5 billion in exchange for that amount, making a profit of USD2, 5billion.

A successful speculative attack unfolds like a self-fulfilling prophecy: The large sales of local currency by speculators create an imbalance between offer and demand, which other investors, concerned by the possibility of a devaluation, amplify by switching their holdings of local currency to USD. They might even take short positions themselves as they are virtually risk free.

In our example, the demand for LC 's will fall dramatically. The central bank can try and defend the peg by buying LC 's with USD. But its own foreign currency reserves, as noticed by the speculators, are inadequate and no match for their firepower. If the speculators persist, the central bank will eventually run out of USD and have to give up the fight. It will have to abandon the peg and de facto devalue the currency.

NB: We have assumed, for the sake of simplicity, that the forward rate is the same as the spot rate or close to it.

If the interest rate of the local currency is higher than the USD rate, the interest rate difference will be a cost to the speculator. In the example, if the interest rate differential is 10%, the forward rate is 1,1 LC for 1 USD. If the peg resists, the speculator on delivery date will therefore have to pay USD 5,5 billion to buy the LC 5,5 he has sold forward. He will however only receive USD5 billion, thus making a loss of USD 500 million.

The higher the rate, the higher the risk for the speculator. This is why central banks may decide if it is not already too late, to increase local rates, sometimes by several hundred percents, to discourage speculation. High interest rates have, however, a destructive impact on economies and are not a sustainable long-term measure.

#### 5.2.2.3 Using interest rates

As seen above, forward rates are determined by the interest rate differential between the 2 currencies involved. If a trader believes that the differential is going to change i.e. narrow or widen, he may take a position to take advantage of the expected move.

#### Example

A trader believes that South-African interest rates are going to increase in the next few days, while USD rates will remain unchanged.

He will buy USD 10 million forward, for maturity in 180 days. The spot rate is ZAR/USD 10.00, and the forward rate 10.25 based on an interest rate differential of 5% per annum.

If 30 days after booking this contract, the South-African exchange rates have indeed increased, say by 5%, he will enter into a swap, i.e. buy USD 10 million spot and sell them back 150 days forward to match the maturity of the first contract.

He will make a profit because he is selling the USD at a much larger premium than the premium paid on the purchase leg of the transaction:

In terms of the first contract, he had to deliver ZAR 10 250.000.

In terms of the swap, if the spot exchange rate has not changed, he will receive ZAR 10 416 700 at a forward rate of 10.4167, based on the 10% premium, and make a profit of ZAR 166.700 on the deal.

We assumed, to simplify, that the spot rate had not changed. This is in fact irrelevant, since the second leg is a swap, i.e. the simultaneous buying and selling of USD 10 million which cancels out the currency movements.

### **5.3 Example of arbitrage**

Arbitrage is the process of taking advantage of discrepancies existing between markets that should be identical.

Arbitrage can be explained by way of an example, based on the same Reuters screen:

**Reuters page showing major currencies quoted against the American dollar**

<b>1400</b>	<b>BARCLAYS BANK PLC LONDON</b>	<b>245</b>	<b>6895</b>	<b>TX</b>	<b>245</b>	<b>6899</b>
<b>BAST</b>						
	<b>SPOT</b>	<b>1M</b>	<b>2M</b>	<b>3M</b>	<b>6M</b>	<b>12M</b>
	<b>BID/OFFER</b>					
GBP	1.5020/1.5025	-28/-26	-54/-53	-84/-83	-172/-170	-336/-333
JPY	121.70/121.75	-20/-19	-38/-37	-57/-56	-118/-116	-273/-271
ZAR	10.3400/10.3900	935/960	1800/1835	2720/2760	5350/5450	10500/10700

	<b>BID rate</b>	<b>OFFER rate</b>
USD/ZAR spot rate	10.3400	10.3900
12 month USD/ZAR forward margin	10500	10700
12 month Rand interest rate	12.95	12.65
12 month US dollar interest rate	2.25	2.35

Assume Bank A2, based in Johannesburg, is long of dollars in the 12 months i.e. it will receive USD in 12 months and wants to neutralize that exposure.

The bank can square its position by doing a swap, buying spot and selling dollars 12 months forward at a spread of 10500 points.

However, it can use arbitrage to enhance its profitability.

The arbitrage, in this case, is between the actual interest rate differential and the forward points. As seen in section 3, those should be identical, since by definition, it is the interest rate differential that determines the forward points.

In this instance, however, we assume that, to encourage borrowings in USD fully covered over ZAR borrowings, the South African reserve bank, which provides the forward contracts to the market, has decided to reduce the forward points (premium).

**These are the steps:**

Bank A2 borrows dollars at 2.35%.

These dollars are sold for the equivalent Rands in the spot market, and earn deposit interest of 12.65%.

Bank A2 will therefore benefit to the value of 10.30%.

Alternatively, these can be converted into forward points of:

$$(12.65 \times 10.3900 \times 365) / (360 \times 100) = 13325 \text{ points}$$

This indicates that Bank A2 is better off by  $(13325 - 10500) = 2825$  forward points should it do an arbitrage deal rather than a swap transaction.

Let us note that this transaction is risk free for the bank. Arbitraging, in general, is a risk free transaction.

## **5.4 Transactions with customers**

Much of the activity in trading rooms is focused on marketing services and maintaining customer relationships.

Most banks have “customer dealers” in direct contact with clients, advising them on strategy and carrying out their instructions.

Treasury operations will make money on the spreads they take on spot and forward margins they quote to non – bank customers e.g. corporates or fund managers.

### **Example**

Using the table above, and applying the aforementioned rules, here are a few examples:

A South African importer wishes to buy USD 10 million in the spot market.

The Reuters’ screen reads 10.3400/10.3900

Bank A2 will sell dollars to the client at 10.3900.

However, the rate the client gets depends on a number of factors, the most important of which are:

- Client credit risk
- Market conditions and volatility. A volatile market will mean wider spreads.
- Transaction amount. Generally speaking, a large deal of this size will attract a market related rate, more so than a smaller (retail) amount would.

Assuming the client is large, the market is liquid and there are no factors influencing it one way or the other, and that the amount is marketable, the customer dealer gets the following rates:

<b>Market rate</b>	<b>Loaded rate</b>
10.3900	10.4000

There is no rule of thumb on how large margins should be, although they should not (generally) exceed the amount of the BID/OFFER spread. In this case the quoted rate of USD/ZAR10.3400/10.3900 suggests the margin should not be larger than 5 cents.

## Case studies

### 1. Foreign exchange quotations

#### Case 1 - Spot contracts

Reuters page showing major currencies quoted against the American dollar

<b>1400</b>	<b>BARCLAYS BANK PLC LONDON</b>	<b>245 6895</b>	<b>TX</b>	<b>245 6899</b>		
<b>BAST</b>						
	<b>SPOT</b>	<b>1M</b>	<b>2M</b>	<b>3M</b>	<b>6M</b>	<b>12M</b>
	<b>BID/OFFER</b>					
GBP	1.5020/1.5025	-28/-26	-54/-53	-84/-83	-172/-170	-336/-333
JPY	121.70/121.75	-20/-19	-38/-37	-57/-56	-118/-116	-273/-271
ZAR	10.3400/10.3900	935/960	1800/1835	2720/2760	5350/5450	10500/10700

Looking at the same bank screen as in 2.2.2.3, how much would a bank based in Johannesburg have to pay in USD to purchase ZAR 20million from Barclays PLC London?

What the screen is telling us is that Barclays London will buy one USD for 10.34 ZAR (on the left) and sell one dollar (on the right) for 10.39 ZAR.

The Johannesburg bank is buying ZAR, in other words selling USD to Barclays. Barclays is therefore buying USD. The price is ZAR 10.34.

In order to buy ZAR 20million, the Johannesburg bank must therefore pay:

ZAR 20,000,000: 10.34 = USD 1,934,235

#### Comment

The practical approach is to envisage the transaction from the quoting bank's point of view, since this is how the price is quoted. In this case, for the Johannesburg bank, buying ZAR is selling USD to the quoting bank.. From the quoting bank's point of view, this sale is a purchase. The bid rate is the rate to use.

#### Case 2

Looking again at the screen above, what is the interest rate differential between a one-year Euroyen and a one-year Eurodollar deposit?

The screen shows that the Yen is trading at a discount against the USD in the forward market, as the buy and sell figures are shown with a minus sign: they

have to be subtracted from the spot price to arrive at the forward price.

This is also indicated by the fact that the bid figure on the left is a higher number than the offer figure on the right.

This also indicates that the Yen deposits have a lower interest rate than the USD deposits. As explained in section 3.6.2, under “practical advice” the currency on the right side of the quote is the Yen, which is at a discount; therefore it is the currency with the lower interest rate of the currency pair.

The discount is the interest rate differential translated into the forward price. The interest differential is therefore:

For one year deposits:  $273 \div 12170 \times 100 = 2.243\%$  based on the bid price.

$271 \div 12175 \times 100 = 2.226\%$  based on the offer price.

For 3 months deposits:  $57 \div 12170 \times 100 \times 4 = 1.87\%$  based on the bid price

$56 \div 12175 \times 100 \times 4 = 1.84\%$  based on the offer price.

### **Comments**

In practice, the deposit rates can be seen on a different page of the Reuters screen.

In countries where arbitrage opportunities exist, dealers, however, will check if the above calculation is corroborated by the difference in money market deposit rates.

Note that bid and offer rates give slightly different results. This is due to the profit margins taken by the bank, which are not the same, in this case, for spot and forward contracts:

For example, the bid/offer spread for USD/JPY spot is 5 points (70/75) whilst the 3 months is only one point (57/56). Using the same spreads would give the same interest rate differentials.

The fact that the differential differs for the various periods is due to the different yield curves of the 2 currencies.

## **2. Hedging decisions**

### **Case 3**

#### **Scenario**

An Australian mass retailer sources its supply of audio equipment, electrical appliances and clothing from 7 different countries in the Far East. More than 20 shipments are received every month.

Invoices are denominated in USD and payment terms average 30 days from shipment. Goods are generally shipped 15 days after placing the order.

The USD, due to the large purchase of US securities by foreign investors is steadily appreciating against the AUS as well as the EUR and JPY. This trend is expected to continue for the foreseeable future. The last 12-month USD/AUS appreciation has been 12 %.

The policy of most Far Eastern countries is to peg their local currency against the USD, and they therefore show little flexibility in their pricing.

The average net profit margin made by the retailer on the imported products is 15 % average.

USD and AUS interest rates are as follows:

	1 month	6 months	12 months
USD	2 %	2 %	3 %
AUS	5 %	5 %	4 %

The company's policy is to systematically cover every foreign exchange exposure as soon as it arises. Accordingly the treasurer matches every order with a 45 days forward contract.

### **Discussion**

The cost of the forward cover is:  $5\% - 2\% = \frac{3\% \times 45 \text{ DAYS}}{360 \text{ DAYS}} = 0.375\%$  of the cost of the imported goods.

Clearly, the cost of the forward cover is not significant relative to the profit margin of 15 %, and the potential risk posed by the rampant USD.

There appears, therefore, to be a fairly strong case to hedge all the company's imports from that region.

What is far more questionable, in this case is the practical approach taken by the treasurer.

There are 2 fundamental problems:

1.) By taking forward cover on a contract-by-contract basis, the treasurer is creating an administrative and accounting chaos for himself and his accounting department:

Not only does he already create more than 20 contracts a month, but also it is highly unlikely that the goods will arrive precisely on the expiry date of each contract. Extensions and / or early drawdowns will require swaps, which could



create an additional 40 or so spot and forward contracts as well as liquidity adjustments that have to be recorded.

2.) By covering every transaction for 45 days at a time, the company is only protected against the depreciation that might occur during that relatively short period.

Beyond that, the next forwards will be based on the new, lower, spot rate.

It would, in this case, probably be a much better strategy to take a “blanket cover” i.e. one single forward contract for at least one-year worth of imports, or more, as:

a) The cost of the forward cover is only 1% of the imports cost.

b) This approach will drastically reduce the number of contracts and liquidity adjustments:

Each import payment will be settled at the prevailing spot rate. All those payments will in fact be early drawdowns, with all the swaps maturing on the same date as the original forward contract, with only one single liquidity settlement on that date.

Example:

If the total value of imports for the financial year starting 1 July 2002 is AUS 50 million, the importer will on that date, book a 1-year contract for that amount. The maturity date is 30 June 2003.

Every shipment invoice will be settled as and when they fall due by booking a spot contract at the then ruling spot rate.

Whether the spot rate is more or less advantageous to the importer is irrelevant, as on 30 June 2003, a cash settlement will bring back the overall cost of the imports in line with the forward price of the original one year forward (See section 3.7.3.4 of the module)

## **Case 4**

### **Scenario**

A South African beef producer has bank debt in the amount of ZAR 240 million on its balance sheet. The company is highly leveraged with a gearing ratio of 2:1, i.e. the net worth is ZAR 120 Million.

Interest rates in South Africa are around 22% per annum. At that level, the annual interest expense absorbs virtually all the company's profits (PBIT of ZAR 60 million)

In an attempt to reduce the interest expense, the company decides to borrow offshore in USD. US interest rates are in the region of 4 %, affording the company a saving of

18%, or ZAR 43 million, which restores it back to profitability.

The ZAR/USD is 1 ZAR = 0.80 USD.

However the high interest rate environment, the existence of a dual currency system (financial and commercial Rands), and strict restrictions on capital movements, are a reflection of the country's inability to retain, let alone attract capital.

The situation abruptly deteriorates when a large foreign bank decides to cancel its credit lines to the South African government. The exchange rate brutally drops to ZAR/USD 0.48, a drop of 40 % in a matter of days.

The South African authorities have no alternative but to declare a debt moratorium.

The impact on the company is devastating: at the new exchange rate, the dollar denominated debt is now ZAR 400 Million, an increase of ZAR 160 Million which wipes out the company's net worth of ZAR 120 Million. The company is now in fact bankrupt.

### **Discussion**

The decision was an attempt by the company to solve a weak financial structure and low profitability by taking a financial risk. Note that in this case taking forward cover on the loan would have eliminated the exchange risk but defeated the initial objective of reducing the interest expense. The cost of the cover would have raised the borrowing costs to 22% i.e. the same as the cost of borrowing in ZAR.

The case above is inspired from the foreign exchange debacle that crippled the Kanhym Company in 1986. This company, part of the South African mining group GENCOR, had to be rescued by its parent.

Other issues highlighted by this case are:

- The importance of internal controls. The holding company, which did operate a sophisticated central treasury at the time, was not aware of the exposure taken by its subsidiary.
- The rapidity of the decline in the currency, which made it impossible to take remedial action.
- The fact that currency fluctuations very often exceed interest rates differentials

### **Case 5**

#### **Scenario**

A UK coal exporter has secured export contracts totaling USD 100 million for the next 12 months. All the contracts are denominated in USD.

He has 2 objectives:

- 1.) Fix the GBP/USD exchange rate, as his view is that the Pound might strengthen over that period.
- 2.) Raise finance against the export contracts, as he needs liquidity.

### **Discussion**

Interest rates in the UK are at 13 % versus 3 % in the USA. The ruling GBP/USD spot rate is 1.53846.

To achieve his objectives, the exporter has 2 alternatives:

A) He can book a 1-year forward contract of USD 100 million to cover all his exports.

To raise liquidity, he will discount his export contracts on day 1 with a bank. He will receive GBP 65 million, less the interest charged upfront at the rate of 13 %.

As and when the export proceeds are received, they are credited into the bank's account and converted into GBP by drawing against the FEC.

The foreign exchange risk has been eliminated. The bank knows that the USD export proceeds will convert into enough GBP to liquidate the loan, even if the Pound rises against the USD.

In terms of interest charges, the exporter will pay, in effect, a net interest cost of 3 % since:

- 1) The bank charges 13% on its loan.
- 2) The exporter enjoys the 10% interest rate differential between the 2 currencies through the forward rate.

The net interest cost of 3% equates the cost of borrowing in USD.

B) The exporter can borrow in USD and take no cover.

The USD export proceeds are applied to the repayment of the USD loan as and when they are received.

The foreign exchange risk is also eliminated: The USD loan proceeds are converted into GBP on day 1, and USD export proceeds are then used to liquidate the USD loan.

The interest charge is also 3%.

### **Comments**

For the exporter, the two alternatives above are nothing else but the two "routes", money market (B) and foreign exchange (A), used by banks to construct forward contracts for their customers. (Section 3.5).

Which route will be chosen does not depend on the interest cost, which should be the same, unless there is an arbitrage opportunity.

Option (B) is, from an administrative point of view, slightly simpler to manage. It presupposes, however, the availability in the country of the exporter of a foreign currency, overdraft type of credit facility to accommodate repayments of uneven amounts at irregular intervals. Many countries do not offer this type of facility.

## **Case 6**

### **Scenario**

A South African wholesaler acquires the entire share capital of a similar, but larger, company based in Australia. The South African company is listed on the Johannesburg stock exchange.

The acquisition is financed through a 3-year Eurodollar club deal of USD 250 million arranged by London banks. The capital is repayable at the end of the 3 years (“Bullet” Repayment), although prepayment is allowed.

The assets and turnover of the acquired company account for two thirds of the new combined entity.

The initial intention is that the loan will be partially repaid through a share issue of USD 100 million, to take place when market conditions permit, and the rest from internal cash flow. Due to South African exchange controls, the cash flow, at least in the first two years can only be externalized from the Australian operation.

### **Discussion**

Two months after the acquisition is completed, it becomes clear that the equity markets are not favourable to proceed with the international share placement, and that the debt will remain on the group’s balance sheet for the foreseeable future.

As a result, the group’s gearing (the bank debt to net worth ratio) remains at 3:1, a high level for this type of company. The new USD loan accounts for 80% of the group’s total debt. The balance sheet, in USD millions, looks as follows:

	<u>Liabilities</u>		<u>Assets</u>
USD debt	250 million	AUS assets	278 million
ZAR debt	62 million	ZAR assets	138 million
Net worth	104 million		
Total	416 million	Total	416 million

The foreign exchange risks the group is exposed to are the following:

1.) Transaction risk

The offshore loan is denominated in USD, but the source of repayment for both capital and interest is in Australian dollars and/or South –African Rands. In fact, because of South African exchange control restrictions, the South African company will only be allowed to use ZAR to service the USD 250 million loan after a waiting period of 2 years. In the interim, only AUS can be used.

2) Translation or accounting risk

The bulk of the assets on the group's balance sheet, on the other hand, are in AUS, the rest in ZAR.

There is no debt on the Australian company's balance sheet, so the balance of the group's debt is in ZAR.( ZAR 62 million ).

The consolidated accounts are reported in ZAR to the shareholders.

The main risk is the appreciation of the USD against, mainly, the AUS, and also the ZAR, as this would further increase the group's gearing, which is already dangerously high.

On the advice of their house bank, the wholesaler decides to take an AUS one-year forward cover on the USD 250million loan, plus interest. In other words the company buys forward USD 250 million for maturity one year later.

The (Euro) AUS interest rate for 1 year is 4% while the (Euro) USD interest rate for the same period is 3%. The company has therefore to pay a premium of 1% over the spot price, since it is buying the USD forward with a currency (AUS) attracting a higher interest rate.

**Comments**

Was it good advice from the house bank?

The answer is most probably yes:

The forward cover eliminates both the transaction *and* the translation risks. In this case the group's balance sheet, given the uncertainty surrounding the share issue, is already in a precarious position, and so is the debt repayment ability.

Unless there are clear signs that the USD is on a long-term weakening trend against other currencies, a 1% premium seems a small price to pay to avoid potentially disastrous exchange rate fluctuations: a 20% increase in the USD would practically obliterate the group's net worth, annihilate its debt servicing capacity and rule out a share issue.

A 20% appreciation in the USD against other major currencies is by no means an exceptional scenario: in the 1990's, the USD appreciated more than 30% against EMU currencies.

## **Annexure # 1**

### **Triennial Central Bank Survey**

**March 2002**

### **Foreign exchange and derivatives market activity in 2001**

#### **1. Summary of main findings 1**

In April and June 2001, 48 central banks and monetary authorities participated in the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity.<sup>2</sup> They collected data for April 2001 on turnover in traditional foreign exchange markets – those for spot transactions, outright forwards and foreign exchange swaps – and in over-the-counter (OTC) currency and interest rate derivatives. Preliminary results on turnover were published in October 2001. The survey also covered data on amounts outstanding of OTC foreign exchange, interest rate, equity, commodity and credit derivatives. These data were collected at end-June 2001 and preliminary results were published in December 2001. This was the fifth global survey since April 1989 of foreign exchange market activity and the third survey since March/April 1995 covering also OTC derivatives market activity. This report summarises the final global results on foreign exchange market turnover and the final statistics on OTC derivatives market turnover and amounts outstanding.

#### **1. Foreign exchange market turnover**

The April 2001 data on turnover in traditional foreign exchange markets show that several important changes have occurred in these markets since the last survey was conducted in April 1998.

Turnover in traditional foreign exchange markets declined substantially between 1998 and 2001. In April 2001, average daily turnover was \$1,200 billion, compared to \$1,490 billion in April 1998, a 19% decline at current exchange rates and a 14% fall when volumes are measured at constant exchange rates (Table B.1).<sup>3</sup> The decline in turnover over the last three years contrasts with the findings of previous surveys, which had reported a rapid rise in foreign exchange market activity.

1. Paola Gallardo, Blaise Gadanecz, Denis Pêtre and Karsten Von Kleist provided excellent research assistance.
2. The geographical coverage of the survey has been progressively expanded, from 21 countries in 1989 to 26 countries in 1992 and 1995, 43 countries in 1998, and 48 in the latest survey.
3. The evaluation at constant exchange rates removes the impact of exchange rate changes from the changes in nominal trading volumes. A more detailed explanation of the computation of turnover at constant exchange rates is given in Section D.13 below.

Turnover did not decline uniformly across instruments. Trading volumes fell sharply in spot markets and, to a lesser extent, foreign exchange swaps (Graph B.1). By contrast, trading in outright forwards increased slightly. The April 2001 figures also reveal some changes in the relative importance of trading between different counterparties. Trading between reporting dealers fell substantially, and its share in total turnover dropped from 64% in 1998 to 59% in April 2001 (Graph B.3). This can in part be explained by the growing role of electronic brokers in the spot interbank market, since the use of electronic brokers tends to reduce the need for foreign

exchange dealers to trade actively among themselves.<sup>4</sup> Another factor seems to be the decrease in risk tolerance that followed the financial market turbulence in the autumn of 1998.

Trading between banks and non-financial customers also declined markedly, possibly as a result of an acceleration of the consolidation in the non-financial corporate sector, and its share fell from 17% to 13%. By contrast, transactions between banks and financial customers increased and their share in total turnover rose from 20% to 28%. The higher activity between these counterparties seems to reflect the increasing role of asset managers. Market commentary suggests that the role of hedge funds in foreign exchange markets has on balance declined somewhat since the previous survey.

The introduction of the euro appears to have reduced turnover mainly through the elimination of intra-EMS trading. The euro entered on one side of 38% of all foreign exchange transactions – higher than the Deutsche mark's share in 1998 but lower than that of all euro constituents taken together in 1998 (Table B.4). The relative importance of other currencies seems not to have changed substantially since 1998. The shares of the dollar and the yen edged up to 90% and 23%, respectively. Dollar/euro was by far the most traded currency pair in 2001 and captured 30% of global turnover, followed by dollar/yen with 20% and dollar/sterling with 11% (Table B.6). Trading in emerging market currencies captured about 5% of foreign exchange activity in 2001, compared with 3% in 1998.

Finally, the data for 2001 reveal an overall decline in the number of reporting banks. This is consistent with the broad trend towards consolidation in the banking industry and the consequent reduction in the number of trading desks (Table B.5). This trend seems to have been an additional factor contributing to the decline in foreign exchange market turnover, especially in the interbank market.

For its part, the geographical distribution of foreign exchange trading appears not to have changed substantially over the last three years. Turnover fell in most countries, with some notable exceptions (Table B.7). In Japan, turnover increased mainly because of a surge in cross-border foreign exchange swaps. In Sweden and Canada, a relaxation of restrictions on institutional investors boosted foreign exchange market activity. In Australia, activity rose as a number of global players have centred their Asian time zone foreign exchange business in Australia.

4. See Gabriele Galati, "Why has global FX turnover declined? Explaining the 2001 triennial survey", BIS Quarterly Review, December 2001. as a number of global players have centred their Asian time zone foreign exchange business in Australia.

## 2. OTC derivatives market activity

### 2.1 Turnover data

Global daily turnover in foreign exchange and interest rate derivatives contracts, including what are considered to be "traditional" foreign exchange derivatives instruments, increased by an estimated 10% to \$1.4 trillion between April 1998 and April 2001 (Table C.1). This represented a significant slowdown in market expansion relative to the period 1995-98, when daily business had expanded by 44%.

This slowdown masked a divergence in the evolution of the two largest market segments, with business in foreign exchange products declining by 12%

and that in interest rate instruments rising by 86%. The downturn in foreign exchange products was consistent with lower turnover in the spot market for foreign exchange, a market segment that has experienced substantial structural change in recent years. In that context, a particularly significant factor has been the introduction of the euro, which led to a sharp contraction of trading in contracts involving euro zone currencies. By contrast, the strong expansion of activity in interest rate products was largely driven by the buoyancy of the interest rate swap market. This buoyancy reflected a broad shift in hedging and trading practices in US fixed income markets and the creation of a large and liquid market in euro-denominated interest rate swaps.

Despite the contraction observed in foreign exchange products, turnover in that market segment continues to be substantially higher than that for interest rate products, owing largely to the shorter maturity of the first group of contracts. However, if interest rate business continues to expand as rapidly as it has done over the past few years, it could eventually catch up with that in foreign exchange products (Table C.2).

The data on turnover also showed a major difference in the evolution of counterparty business between the two main groups of products (Table C.1). In the area of foreign exchange derivatives, business within the group of reporting dealers declined by 18%. This decline may have been related to the broad factors affecting the spot market. In the area of interest rate products, by contrast, business within the group of reporting dealers grew by 115%. The turnover figures also revealed that London and New York remained the most important centres for OTC derivatives trading but that Frankfurt made significant gains, displacing Tokyo as third most important trading centre (Table C.4).

## *2.2 Notional amounts outstanding and gross market values*

While the turnover data provide a snapshot of activity in the month of April 2001, a somewhat different perspective is provided by notional amounts outstanding, which give an idea of the “cumulative” amount of business (Table C.5). At the end of June 2001, global OTC positions in all categories of market risk (including equity, commodity, credit and “other” derivatives) stood at nearly \$100 trillion, a 38% increase relative to the 1998 survey. This nonetheless represented a slowdown in the rate of expansion relative to 1998.

Moreover, as was the case for the turnover data, there was a divergent pattern of activity between the two market segments, with the stock of foreign exchange products declining by 7% and that of interest rate contracts growing by 58% (Table C.6). In contrast to the turnover data, the most recent positions data confirm the predominance of interest rate over currency products.

Positions data also show a rapid expansion of the market for credit derivatives (Table C.6). That market segment has benefited from a widening in the range of instruments and from improvements in market infrastructure. Data on the maturity structure of foreign exchange and interest rate contracts (Tables C.7 and C.8) show an overall lengthening in the maturity of outstanding positions. The stock of short-term foreign exchange contracts declined significantly, while that of longer-term foreign exchange and interest rate instruments expanded notably.

Gross market values, which measure the transfer of wealth in OTC markets at current market prices, rose from \$2.6 trillion at the end of June 1998 to \$3 trillion at the end of June 2001. When set in relation to notional amounts outstanding, the ratio declined from 3.6% to 3.1%. This was somewhat surprising given the evolution of global financial markets between the two



reporting periods. Market volatility was not markedly higher in the first half of 2001 than in the same period in 1998, but market variables, such as short-term interest rates in some of the major industrialised countries, traced a rapid descent, which would have been expected to generate large movements in market values. The reasons for the decline in the ratio of gross market values to notional amounts would warrant further investigation.

It should also be stressed that gross market values overstate the derivatives-related credit exposures of reporting institutions, which are significantly reduced by netting and collateral arrangements. Such credit exposures stood at \$1 trillion in June 2001.

## **2. Traditional foreign exchange markets**

### **1. Global turnover**

Foreign exchange market activity declined markedly between 1998 and 2001. This is in sharp contrast to the previous surveys, which had shown substantial growth in trading volumes. Average daily turnover in traditional foreign exchange markets was estimated at \$1,200 billion in April 2001 compared to \$1,490 billion in April 1998, representing a 19% decline (Table B.1).<sup>5</sup>

5. The six emerging market countries that in 2001 participated in the survey for the first time captured about 0.2% of total foreign exchange turnover (see Table B.7).
6. See footnote 3.

euro, the growing share of electronic broking in the spot interbank market, consolidation in the banking industry and international concentration in the corporate sector appear to have been the main factors driving the fall in turnover.<sup>7</sup> Moreover, there may have been a lasting change in the risk tolerance of banks between April 1998 and April 2001. In particular, the financial market turbulence in the autumn of 1998 apparently led banks to reduce credit limits and to engage in less proprietary trading, thereby contributing to the contraction in foreign exchange market turnover.

### **2. Market segments**

Among the different instruments, the decline was most pronounced in spot markets, where average daily turnover fell from \$568 billion to \$387 billion (Table B.1). Trading volumes in foreign exchange swaps dropped from \$734 billion to \$656 billion.<sup>8</sup> By contrast, trading in outright forwards increased slightly to \$131 billion. These changes are consistent with a trend towards a reduction in the share of spot turnover and a rise in the share of swaps in overall foreign exchange market turnover that has been evident since 1992 (Graph B.1).

7. See Galati (2001).
8. Foreign exchange swaps commit two counterparties to the exchange of two cash flows and involve the sale of one currency for another in the spot market with the simultaneous repurchase of the first currency in the forward market. By contrast, currency swaps (or cross-currency swaps), which are discussed in the next section on OTC derivatives markets, commit two counterparties to several cash flows, which in most cases involve an initial exchange of principal and a final re-exchange of principal

upon maturity of the contract, and in all cases several streams of interest payments. See instrument definitions and categorisation in Section D.6 below.

### 3. Types of counterparty

The April 2001 figures also reveal some changes in the relative importance of trading between different counterparties. Trading between reporting dealers fell substantially, from \$908 billion to \$689 billion (Table B.3). This can in part be explained by the growing role of electronic brokers in the spot interbank market. The use of electronic brokers implies that foreign exchange dealers generally need to trade less actively among themselves. The contraction in interbank trading seems also to reflect the growing concentration in the banking industry and the consequent reduction in foreign exchange trading desks. Transactions between banks and non-financial customers also fell, from \$242 billion to \$156 billion. This development might be associated with the trend towards concentration in the corporate sector through the centralisation of corporate treasury functions and the consequent increase in intracompany netting of foreign exchange flows. It may also reflect the acceleration over the last few years of the trend towards a cross-border consolidation in the corporate sector.<sup>9</sup> By contrast, trading between banks and financial customers increased from \$279 billion to \$329 billion.

The higher trading volumes between banks and other financial institutions seem to have reflected the increasing role of asset managers. Market commentary suggests that the role of hedge funds in foreign exchange markets has on balance declined somewhat since the previous survey.

As a result of these developments, the share of interbank trading in total turnover declined from 64% to 59%, the share of bank to non-financial customer trading fell from 17% to 13% and the share of activity between banks and non-bank financial customers rose from 20% to 28% (Graph B.2).

9. The decline in non-financial customer activity cannot be reconciled with global trends in real output or trade in goods in services.

### 4. Currency composition

The introduction of the euro appears to have reduced turnover mainly through the elimination of intra-EMS trading. The April 2001 statistics show that the euro entered on one side of 38% of all foreign exchange transactions (Table B.4). This share is higher than the Deutsche mark's share in 1998 (30%) but lower than that of all euro constituents taken together in 1998 (53%). This is mainly due to the elimination of trading between the legacy currencies of the euro.<sup>10</sup> The relative importance of other currencies seems not to have changed substantially since 1998. The dollar's share in foreign exchange markets edged up from 87% in 1998 to 90% in 2001. The yen's share increased slightly to 23% in 2001. The pound sterling was on one side of 13% of all foreign exchange transactions in 2001, a 2 percentage point rise since 1998, while the share of the Swiss franc dropped by 1 percentage point to 6%. Other currencies whose market share rose include the Canadian and Australian dollars, the Swedish krona and the Hong Kong dollar. The combined share of emerging market currencies also increased noticeably, from 3% to 5% of total foreign exchange turnover.

Dollar/euro was by far the most traded currency pair in 2001 and accounted for 30% of global turnover (Table B.6). It was followed by dollar/yen

with 20% and dollar/sterling with 11%. In foreign exchange markets in emerging market countries, the dollar still remains the dominant currency, with the exception of parts of eastern Europe (Annex Table E.4). In 2001, the euro captured a dominant market share in the Czech Republic and Hungary but continued to be outweighed by the dollar in Poland and Russia.

#### 5. Market concentration

The consolidation trend in the banking industry that started in the mid-1990s appears to have continued between 1998 and 2001. This is evident from the overall decline in the number of reporting banks for the 26 countries that participated in the last three surveys: 1,945 in 2001 compared to 2,205 in 1998 and 2,417 in 1995. The total number of reporters was about 2,530 in 48 countries in 2001, compared to 3,087 in 43 countries in 1998. There is also evidence of a broad trend towards a contraction in the number of banks accounting for 75% of local turnover since the mid-1990s (Table B.5). In the United States, 75% of forex market transactions were conducted by only 13 banks in 2001 compared to 20 banks in 1998 and about 20 banks in 1995. In the United Kingdom, 17 banks captured 75% of the market in 2001 compared to 24 banks in 1998 and about 20 banks in 1995.

In comparing statistics on reporting banks, it is important to highlight that the reporters covered by the turnover part of the Triennial Survey are individual offices of trading firms rather than banking organisations on a consolidated basis. This implies that statistics on global concentration of foreign exchange business in the banking sector, eg the number of banking organisations accounting for 75% of global trading, cannot be calculated.

Bank mergers, in part spurred by EMU, have led to the contraction in the number of market participants. The acceleration of the consolidation in the banking sector has led to a reduction in the number of trading desks and contributed to the decline in turnover, in particular in the interbank market.

#### 6. Geographical distribution

The geographical distribution of foreign exchange trading appears not to have changed substantially over the last three years (Table B.7).<sup>11</sup> Turnover fell in most countries, with some notable exceptions.

In Japan, turnover increased mainly because of a surge in cross-border foreign exchange swaps. In Sweden and Canada, a relaxation of restrictions on institutional investors boosted foreign exchange market activity. In Australia, activity rose as a number of global players have centred their Asian time zone

10. The reference here is also to individual banking offices rather than banking organisations.

foreign exchange business in Australia. Market commentary pointed to a tendency among commercial banks in some continental European countries to move foreign exchange business to London, while in some other countries banks tended to concentrate their business in their home country. On balance, these two trends appeared to have offset each other, as the United Kingdom's share in total trading was little changed over 1998.