4.5.1 Foreign Exchange and Commodity Risks in Trading

Unit: Unit 1 – Treasury Strategy

Module: Module 4 – Financial risk

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Summary: In trading risk can arise from movements in foreign exchange and commodity prices. Analysis of the whole supply chain helps to understand that risk can sometimes be eliminated but mostly only really reduced. Economic, pre-transaction and transaction risks comprise these risks. Where transactions are not certain, options are often the only real solution to many risks. Accounting can be misleading.

Keywords: supply chain, intrinsic rate, economic, pre-transaction, transaction, price list, option

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Learning outcomes:

1. Financial risks affecting trading include prices in foreign exchange, oil, fuel, energy, agricultural products and metals
2. Translation risk and interest risk generally arise through ownership of business assets
3. Credit risk might be considered part of trading risk but is dealt with elsewhere
4. Risk in trading is best looked at by considering the whole supply chain
5. All members of a supply chain can be affected by the same risk
6. At each end of a supply chain, risks are effectively unlimited
7. In the middle of a supply chain, risks can be limited
8. Supply chain analysis over the long run is very helpful
9. Complications of supply chain analysis include how market prices might be absorbed by end users, price lists, tenders and the existence of competition
10. Financial risk in trading is very much a commercial issue, not the sole domain of the treasurer
11. There is an intrinsic rate for every participant in a supply chain
12. A typical contract has plenty of room for time to affect key input variables such as commodity and foreign exchange rates
13. Classic categorisation of financial risks in trading include transaction risk, pre-transaction risk and economic risk
14. Economic risk can arise from several different directions
15. Response to financial risk must form part of an overall risk framework approach, including elements of measure, appetite and budgeting
16. Transaction risk is trivial in concept but difficult in practical implementation
17. Pre-transaction risk is difficult to respond to and risk cannot be eliminated, only reduced, and time is a big variable to consider. Forecasts are the other main component in addressing the risk
18. Options are one way to approach the contingent risk of pre-transaction exposure
19. Economic risk is about competitiveness and the business model
20. No hedging lasts forever
21. Economic risk has several manifestations and can include approaches to acquisitions and disposals
22. Accounting can be very misleading but cannot be ignored
23. Approach to hedging as a competitive factor can be fraught with danger
24. Risk transfer is almost best described as risk transformation
25. The costs of hedging is mainly opportunity cost and also loss of flexibility
26. Options can be useful in a competitive environment

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1 Introduction

In this reading we address some of the financial risk issues affecting the underlying trade of the business. One feature of this type of risk is that it can often be actually quite difficult for the treasurer to become fully engaged in this type of risk. Treasurers are often appointed at the head office to deal with financing issues, perhaps around M & A work, or just large scale refinancing requirements and their involvement in actual operations is a secondary affair. This is compounded if the firm is a conglomerate with different divisions. Then a treasurer may be seen as a 'head office' person. Managers may not understand the role of a treasurer and not welcome involvement. A successful treasurer must get round this and ensure he gets out of the office and makes efforts to fully understand the underlying business. This will, of course, also pay dividends in all other aspects of the treasurer's work.

This is about the risk of movements in:

- Foreign exchange rates
- Commodity rates, including
  - oil prices
  - fuel prices
  - energy prices
  - agricultural commodities
  - metal prices
  - other (e.g. chemicals, plastics etc.)

If in the reading we talk about one risk such as foreign exchange risk, then it can generally be assumed that this applies to commodity risks as well.

This reading does not cover translation risk or interest rate risk as these are treated as risks of ownership, and perhaps capital and geographical structure, rather than what we consider here, the day to day work of buying, making and selling goods and services.

We will use an example supply chain to illustrate the major issues and see how sometimes we can eliminate[1] these types of financial risk in trading and sometimes we can only decrease them. In any case risks are only ever transformed – for instance by hedging we transform FX risk into credit risk on the bank[2]. We find it useful to consider what happens in the long run in any situation and that any analysis needs to consider the whole supply chain, not just the bit that our own business is sitting in.

This reading will also not look at credit risk, which arguably is part of a trading risk.

[1] Bearing in mind that eliminating one risk almost always generates a compensating risk elsewhere

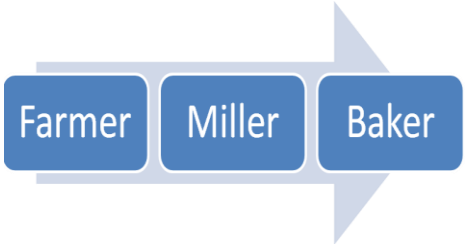
[2] which may be collateralised of course, but which then leads to other risks, and so on

2 An example supply chain

We have emphasised in our studies to date how important it is for a treasurer to understand the dynamics of the business he is helping. It is all too easy to sit in the office with important things to do and not understand the business. In the case of foreign exchange risk in trading, many treasuries simply take orders from their operations and hedge them in the markets. This might work but it risks being totally wrong and many treasurers have stories of visiting an operation to discover that the reality of what goes on is completely different to what they had thought.

To introduce a tool to analyse a business foreign exchange risk we will investigate a simple model of the supply chain. Ultimately all business is the supply chain, from raw materials to the consumer, with many businesses in between. In order to keep things tangible, we will look at a commodity supply chain. Commodities and foreign exchange share many characteristics including volatility, they can generally be traded (although many commodities cannot and trading arrangements must be contractual with other members of a supply chain), they are used by most trading firms and the principles for management are generally identical.

Exhibit 1: Supply chain for wheat



In the supply chain for wheat, somewhat simplified, we have three participants:

Exhibit 2: Participants in the supply chain for wheat

Wheat farmer	Relatively fixed costs Volatile income as price of wheat changes
Miller	Pays for wheat at market price Sells flour marked up from input wheat price for milling costs and profit
Baker	Pays for flour at market price, a volatile expense Relatively fixed costs apart from flour Sells bread to the public who, broadly, expect to pay only inflationary rises

The real supply chain will include customers such as retailers, caterers and the public. All these participants experience risk from the volatility of the price for wheat:

- Farmer gets more or less income
- Miller risks different prices on his expense to the farmer and his income from the baker
- Baker might not recover the full price of flour from his sales of bread if he can only move prices in accordance with the expectations of the public

Let us look in detail at the position of each participant, from several dimensions:

Farmer

- Long run: In the long run the farmer is exposed to the risk of wheat prices. His only choice apart from growing wheat is to grow other crops or turn to livestock; or get out of farming altogether.

- Hedging: If the farmer decides to transfer some of this risk, he can only do it for a short period e.g. a single season, thus fixing his income for this short period.

- Risk: The farmer can only ever hope to decrease this long run risk, he can never eliminate it.

- Measurement: It is probably easy to measure the exposure of the farmer for say each year but measurement of the long term risk is very difficult.

- Effect of hedging: If the farmer fixes the price of his output, he risks losing out if the price of wheat rises.

- Options: The farmer might decide to buy an option and hence secure a minimum price for his output, while enjoying any increases in price.

- Speculation: The line between hedging and speculation is fine. If he takes no hedging, is that speculation? How far ahead does hedging have to be for it to become speculation? The farmer might be tempted to speculate knowing about conditions for growing wheat.

Miller

- Long run: In the long run the miller is not exposed to the risk of wheat prices. The market accepts that the farmer is paid the market price for wheat and that the baker pays the market price for flour (i.e. the market price of wheat plus a margin) to the miller, so the miller only profits from his added value of milling. As wheat prices move, buying and selling prices both follow (although the effects may be lagged). It might be that wheat become so rare that nobody buys bread but that is extreme.

- Hedging: The miller will want to match his prices to the farmer and the baker so hedging might be used if there is a timing difference on buying wheat and selling flour.

- Risk: The miller is in a position to eliminate exposure to the wheat price, by transferring the whole input cost risk to his output price.
- Measurement: It is very easy to measure the exposure of the miller although he will have a natural tendency to make it zero.

- Effects of hedging: There is no particular reason for the miller to use hedges as he will always match purchases to sales at the market rate, but he may hold some stock.

- Options: The miller is not a natural user of options in this supply chain.

- Speculation: The miller may be tempted to speculate as he gets to know the market – for instance agreeing a price and quantity to sell for the next six months, but waiting until later to make the corresponding purchases (i.e. short selling). If he is not matched he is speculating.

Baker

- Long run: In the medium term the baker is exposed to wheat prices. He can only pass on limited price rises and the inflationary rises allowed may not be enough for increases in wheat prices. However, if in the long run he expects to make losses, he would pull out of the business and apply the assets elsewhere.

- Hedging: If the baker decides to transfer some of this risk, he can only do it for a short period, thus fixing his costs for this short period. Note that the cost of wheat is only a small part of the cost of bread, he would also have plant, energy and labour costs – some implied from the miller's operation.

- Risk: The baker can only ever hope to decrease this medium turn risk, he can never eliminate it.

- Measurement: It is probably easy to measure the exposure of the baker, for say each year but measurement of the whole (long term) risk is very difficult. It is probably easier for the baker to leave the business than for the farmer, and this possibly puts a limit on the risk.

- Effect of hedging: If the baker fixes his input (wheat) price, he risks losing if the price of wheat falls.

- Options: The baker might decide to buy an option and hence secure a maximum price for his wheat input cost while enjoying any falls in the price.

- Speculation: The baker might be tempted to speculate knowing about conditions for the demand for bread.

This simple supply chain illustrates almost all of the aspects of any supply chain and so is a useful model to analyse any business where commodity or foreign exchange risk appears. Some market practices might change the dynamics and these might include:

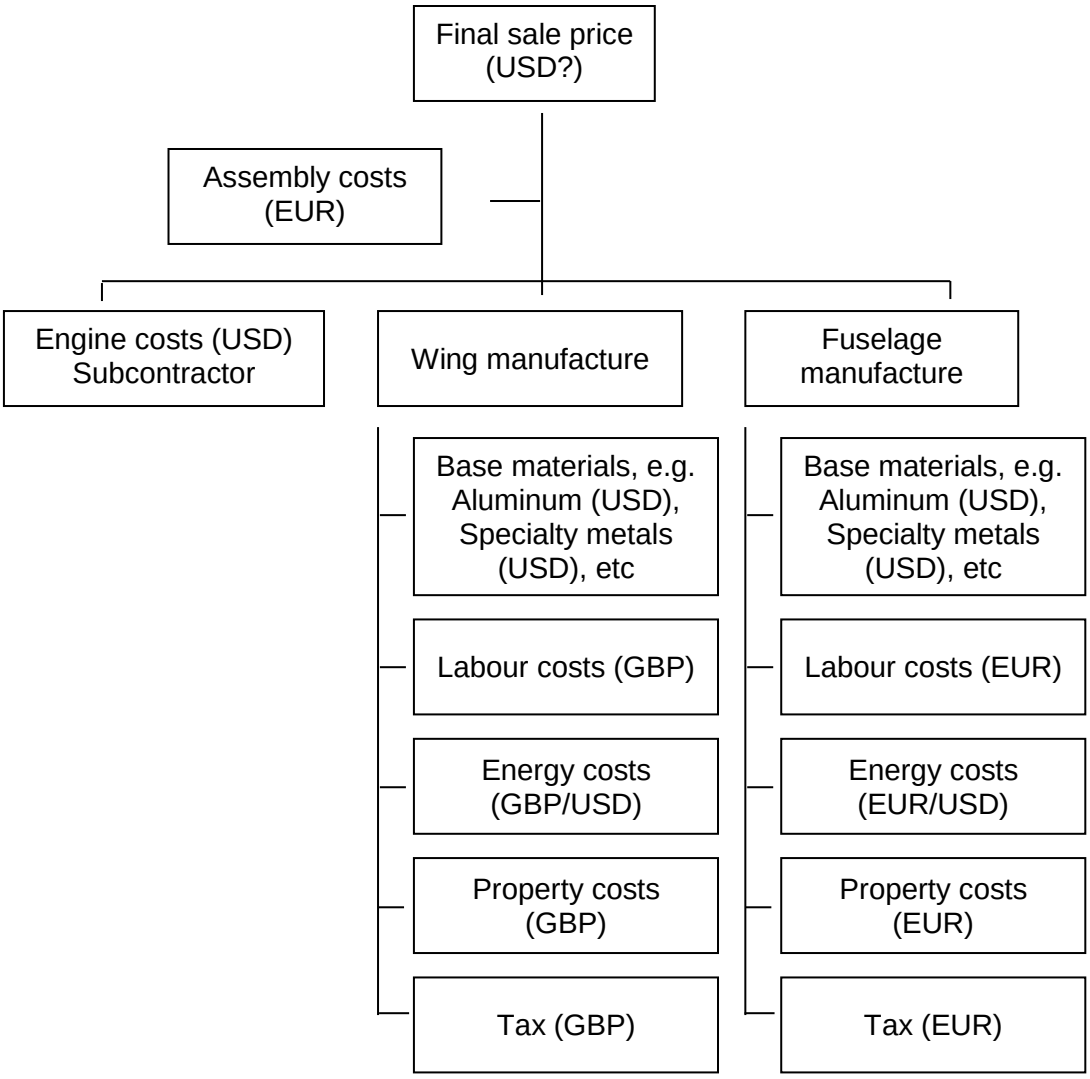
- acceptance or not of a flow-through of current market prices

- the existence of price lists
- the need to tender
- the existence of competition
- where is the pricing power in the supply chain?

3 Where does a corporation sit in the supply chain?

Identifying exactly where a corporate sits in the supply chain is key to understanding the financial risks in trading and we have some tools to help us from our analysis of a simple supply chain. However, most supply chains are much more complex than this. An example of aircraft manufacture is useful to understand this:

Example 1: Supply chain for aircraft manufactured in Europe



Example 1 is of course extremely simplified but brings out issues related to the complexity of supply chains which treasurers need to understand when analysing their own business.

The supply of an aircraft is at the end of a very long and complicated supply chain with many costs included in the final product, each denominated in a variety of commodities and currencies. Coming out of this are:

Exhibit 3: Complexities in the supply chain

Issue	Comment
To what extent is each aircraft priced individually from its component costs, e.g. if aluminium costs rise is that reflected in a sales price or sales conversation?	This might be possible aircraft by aircraft but in many industries the ultimate sale price might be a retail sales price or subject to a price list where prices are inelastic. If pricing is aircraft by aircraft then it is (theoretically) possible to eliminate financial risk (or transactional risk at the least).
To what extent are suppliers squeezed over price rises in their own supply chain or required to offer fixed pricing for a period?	One way to remove financial risk is simply to pass it on to others, either customers or suppliers, but this risks upsetting their business model.
To what extent are transfer prices adjusted to manage exposure and also in what currency are they made?	Transfer pricing is relevant to groups operating in different jurisdictions but the choice of currency for transactions is always an issue for debate.
For each input cost there is an intrinsic foreign exchange or commodity price.	At each stage in the supply chain we can identify a particular base cost which is based on a given currency or commodity price.

All of this points to the fact that financial risk is very much a commercial issue and cannot be separated easily from issues such as pricing, marketing, supplier relationships and so on. The treasurer must therefore be careful to ensure they understand the commercial issues when advising on financial risk.

Some businesses routinely eliminate financial risk in their business model.

Example 2: Inglenook Inc
Inglenook takes scrap metal and jewellery with precious metal content and refines them to sell the precious metal as bullion. For example, old catalytic converters are refined into platinum and old jewellery (e.g. 9 carat gold (around 37.5% gold) is refined into 99.999% gold bullion.

Whenever Inglenook buys in inventory for refining, it determines the bullion content from the material and pays for it based on the current metals price. It immediately sells the bullion content forward for a period reflecting the refining time. Thus at any point in time its holding of a precious metal is covered by its forward sales and it has no risk to the precious metals price, its competitive advantage being its refining skills.

3.1 The intrinsic rate

It is worth thinking about the concept of an ‘intrinsic rate’. This is the rate, or rates, on which the business model is based. It should be possible to identify an assumed or intrinsic rate in

any supply chain. It may be a challenge in some cases but it is necessary to do so to allow proper management of the risk. The intrinsic rate is the rate governing each transaction undertaken by the business, leading to the expected profitability of that transaction. Another way to look at it is that the intrinsic rate is the rate at which an exchange rate gets into a price, contrasting with the hedge, which is how an exchange rate gets out of a price. It is not necessarily a budget rate, which is set infrequently and which may bear no relation to the rates at which a transaction can be achieved.

Example 3: Inglenook Inc
Inglenook, collecting scrap metal and jewellery with precious metal content pays for the stock based on the current metals price. This is the intrinsic rate against which the forward sale is measured.

Example 4: Asimov Inc
Asimov Inc, operating in the capital goods market sector, submits pricing proposals through tenders which are calculated according to exchange rates prevailing at the time of the tender. The intrinsic rate for these contracts is the rate at the time of tender.

Example 5: Partpiece SA
Partpiece Sp zoo, based in Poland, supplies air conditioning assemblies to Bangers GmbH, a eurozone based car manufacturer. A contract for supply for the life of one model, the Bangers 5 series, has been agreed and it is expected that this will last for four to five years. The price has been fixed and volumes have been forecast, but there is no guarantee of volume. The intrinsic rates are the rates assumed in the price planning for this business.

Note: It is likely that there may be some sort of annual re-negotiation of pricing allowing for incorporation of new assumptions, including exchange rates, in which case the intrinsic rates are renewed annually. However, some contracts do operate on the basis shown in this example and do not allow for re-negotiation.

Example 6: Green Parrot AG
Green Parrot sells chocolate to supermarket and other retailers for eventual sale to the retail market. The end price of chocolate is broadly inflexible and has never really been fixed to any exchange rate assumptions. A market is entered on the basis that the return is positive, based on exchange and commodity rates for input costs at the time of investigation.

If the input costs could be hedged, the intrinsic rates achieved could be used to develop budgeted rates for the year.

The reason to consider an intrinsic rate for a particular contractual situation is that it provides a key for a risk response. Taking some examples, if a bank quotes a foreign exchange price, it will leave the price open for just a few seconds and if the price is accepted, then it will hedge away the risk within a few seconds of transacting. Inglenook hedges the risk on precious metals on the same day that it has bought the scrap. For Asimov Inc, as soon as it quotes on a project, then the longer it has the quote outstanding, the larger the risk. Thus to create an

effective response to foreign exchange risk, the nearer we can get to management of the risk at the intrinsic rate, the better we can protect the business model.

4 A timeline for a contract

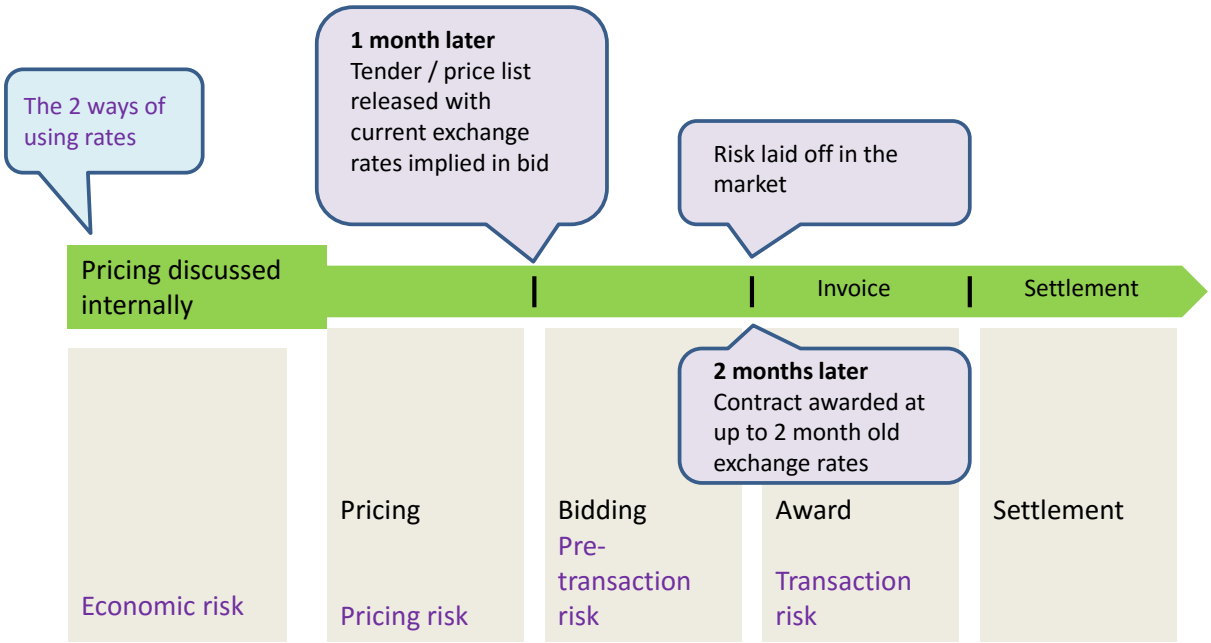
Having established that management of a foreign exchange (or indeed commodity risk) is best performed close to the setting of the intrinsic rate, it is worth considering how that might happen practically and how business life is almost certainly not going to allow that to happen unless close attention is given to the processes. Even then, however, there will still be occasions when it will just not be possible to manage the risk at the same time as the intrinsic rate is set.

Let us consider a simple contract, where a firm supplies a product on a one off basis with:

- income in a foreign currency
- costs in domestic currency
- it takes time:
  - to work out whether you can supply the product
  - to work out capacity
  - to work out what your competitors will charge
  - to work out how much it will cost
  - to work out whether the time scales work for production & delivery
  - to come up with a price
  - for the customer to decide who to buy from
  - to make it, if successful in bidding
  - to invoice
  - to collect the foreign currency

And time, of course, allows exchange rates and commodity prices to move away from their assumed, intrinsic, values.

Exhibit 4: A typical contract time line



We introduce here some different ways to categorise foreign exchange and commodity risk, to which we return later. One way to tackle the problem of risk in these areas is to manage contract timescales properly and ensure that it is understood that time in markets increases risk. Therefore, the more time an exposure is left open, the more risk there is.

5 Categorisation of risks

The phases identified in Exhibit 4 introduce the concept of categorisation of foreign exchange and commodity risk and these are most useful as a way of carrying out evaluation and response to risk. They are essentially related to the time-line in contractual behaviour.

The main types of foreign exchange risk are:

- Economic: Changes in the value of a firm or transaction stream due to underlying cost base or competitive position changes driven by changing exchange rates
- Pre-transaction: Exposures resulting from a commitment to a price list or tenders in a foreign currency or price lists or tenders with a foreign currency cost component
- Transaction: Changes in the domestic currency value received or paid under foreign currency denominated committed transactions

5.1 Economic risk

Economic exposures arise because the present value of expected future cash flows from business streams change as foreign exchange rates change. We use the concept of present value here because we are interested in how much each expected future cash flow is worth to the firm today, and hence how much the total expected future cash flow - i.e. the firm - is

worth today. Economic risk can apply at the macro level to firms, to projects or to operating units, and also at the micro level to transaction streams which are as yet uncommitted.

Economic exposures are sometimes called "strategic" FX exposures. But another useful description is "competitive" exposures, as they often arise when a business is competing with another business working in a different currency environment. A firm may have neither inputs nor outputs denominated in a foreign currency for this to occur: it need only have a foreign competitor. However, if a firm also has foreign currency denominated input or outputs, then it will be exposed to both transaction exposure and economic exposure – and indeed economic exposure is sometimes termed the 'long end' of transaction exposure.

Economic FX exposures are similar in their impact to the business impact of interest rate changes. Economic FX exposures affect business' profitability and competitive position, and the effects differ among firms as to their timing and their magnitude.

5.1.1 Economic risk from market position

The timing of the effect differs depending on the firm's market position and the existence of any long term contracts. High end luxury goods manufacturers may be relatively indifferent to FX rates as they can perhaps charge substantially what they want to their customers. But suppliers of relatively cheaper discretionary goods such as automobiles or electronics can be affected immediately as exchange rates move for or against them. (For example, as customers defer or accelerate the replacement of their car.)
It is worth thinking here about the place in the supply chain where pricing power is held and who it is held by. A firm with price leadership has less economic risk then a price follower.

5.1.2 Economic risk from market sector

The magnitude of the effect differs between sectors. Transactions in the global aerospace and oil industries are effectively denominated in USD. So movements in USD versus other currencies are hugely important for all players. The road and rail transport sectors are largely priced in domestic currency and also largely operate domestically. So they are less concerned about FX movements.

5.1.3 Economic risk from geography

The magnitude of the effect can also differ significantly between different firms within the same business sector. Some firms (e.g. some global automotive manufacturers) regard themselves as truly global with an even spread of activity across countries and currencies. They may be substantially indifferent to economic risk on the basis that an adverse effect due to one currency will be compensated for by a favourable move elsewhere. Other firms may be concentrated in one region or currency (e.g. aero engine makers operate in a global USD-denominated market place) so are exposed to a movement in one currency.

Example 7: Economic foreign exchange risk

A Japanese automobile manufacturer competes with a German firm to sell similar cars in the USA. Each has local cost factors, including local wage rates and material costs, but the relative cost would also depend on the value of the yen versus the euro. An appreciation of the Yen against the euro (so that US dollars buy less yen than euros) would make the Japanese firm less competitive.

5.2 Pre-transaction risk

Pre-transaction risk arises when a firm has to commit to a price before actually entering into transactions or commercial agreements. For example, if a firm exports its products, it may need to publish a price list in the currency of the local market.

If that firm cannot change its local currency price list sufficiently quickly as the exchange rate moves (either because of practical or competitive reasons), then there is a pre-transactional exposure. A similar situation applies under long-term supply agreements, where amounts to be supplied may be uncertain, but the price is already fixed.

Pre-transactional currency exposure would also exist if a firm tendered for a contract payable in foreign currency, or where there were associated foreign currency costs, e.g. for materials or labour etc.

In either case, pre-transactional exposure only turns into a real transaction exposure if the firm actually makes the sale or purchase. The difficulty lies in ensuring that the FX rate available for the actual transaction is not materially worse than the FX rate implied by the pre-agreed price, i.e. the intrinsic rate.

Risk is clearly greater the more tenders or price lists are actually in place at any one time. The longer a tender or price list is valid for, the greater the risk.

Issuing a price list or a quotation effectively sells an option on a commodity or foreign exchange rate. Customer use of this free option varies. For example in the UK retail car markets customers do not look at EUR price equivalent but in industry, firms will compare price lists and quotations in different currencies, giving them a free option which they will take advantage of. We know that options command a premium and therefore price lists need to be considered carefully in that they cost money on issue.

5.3 Transaction risk

Transaction risk is the risk that committed transactions undertaken in a foreign currency are actually worth less than expected, due to changes in FX rates. Although uncommitted transactions are technically classified as economic risk, operationally they are often managed with transaction risk. Since transactions ultimately require conversion in the foreign exchange markets from one currency to another, they therefore have a cash effect.

Examples of transaction risks are:

- sales made in a foreign currency
- payables incurred in a foreign currency
- contracts entered into in a foreign currency

The risk is that the *actual* value of the cash flows in foreign currency will differ from the *expected* amounts because of exchange rate changes. As a result the value of a foreign currency receivable or payable when translated into the currency of the country where the business is located may be more or less than expected.

Transaction exposure is essentially trivial in concept, representing known and understood committed transactions. Of course practically, it is far from trivial and transaction exposure becomes essentially an exercise in discovering data, especially in large groups of international companies.

Example 8: Transaction exposure
Monique SA operates in the supply of spare parts to the capital goods sector. Every day it takes hundreds of orders from customers, the resulting contractual arrangements of which are to create commitments in different currencies, firstly from suppliers, secondly from customers and thirdly from freight forwarders, who transport the spare parts. The orders are entered into the ERP system but the underlying currency of all obligations is not considered at once, as supplier and freight invoices are not recorded until received. No snapshot of the whole position will ever be right at any one time, because although the ERP system records invoices in currency, it only records orders in EUR. Trying to establish the true extent of these commitments, or transaction exposure, is difficult.

Example 9: ERP systems
Malthus Ltd takes multi-currency orders from its logistical base in Ireland. The orders are booked in the currency of order and invoices generated by currency. However, the fundamental recording basis is in euro equivalent, meaning that the ERP system cannot be interrogated by currency. Trying to establish the extent of these commitments, or transaction exposure, is difficult.

6 Risk responses, including elimination and reduction

Bearing in mind the formally described possible responses to risk, of:

- avoidance
- acceptance and retention
- acceptance and reduction
- acceptance and transfer

We now investigate how they relate to the possible outcomes of risk management seen in our supply chain example and consider any other possible responses.

6.1 Response to transaction risk

It should be simple for a firm to add up its similar trade commitments in a particular currency and set them out to calculate whether the overall position is long or short for that transaction stream. (Note that aggregating exposures across dissimilar transaction streams albeit in the same currency may not be appropriate.) It is then a fairly short step to understand that an appropriate response to transaction risk is to hedge it away, or transfer it. The firm must understand the intrinsic rate in each contract and so any other response would amount to speculation.

The relevant product in this case is an outright forward deal, usually used in foreign exchange, or a future, usually used for commodity risk. It is also arguably possible to use an option to

hedge this risk, but treasurers need to be careful to understand that for certain (i.e. committed and definite) exposures, using an option may be effectively speculation, simply investing premium in the hope of an excess return beyond normal trading profit. Such activity could be undertaken completely independently of an underlying commercial flow.

Note, however, that many bank products, such as range forwards, cylinder options and similar products often assume that the expected foreign currency flow is certain. Again, entering into such transactions amounts to increasing risk in the hope of excess returns and treasurers would not usually be permitted to undertake such activity on a standalone basis. Consequently, there is no argument that they should be allowed to do so as an extension of normal hedging activity.

Note also that treasurers often take advice on financial risk from bankers. Bankers' experience of foreign exchange risk can be restricted to their own trading room / corporate desk risk management where the aim is to eliminate risk. Trading room exposures are of a very short time scale and it is very easy for them to hedge away any risk. This is quite the opposite to a corporate where its position in a supply chain can give enormous difficulty in risk management. Banks also make more money when they carry out more transactions. To a great extent, banks therefore are not natural advisers on financial risk.

6.2 Response to pre-transaction risk

Pre-transaction risk is close to the type of risk that the baker has in our simple supply chain, in that the baker has effectively issued a price list (by only being able to implement inflationary price rises). We already know, therefore, that this risk cannot be eliminated and the best that we can do is manage some form of risk decrease. However, this risk will exist on all sorts of levels.

Example 10: Asimov Inc

Asimov Inc, operating in the capital goods market sector, submits pricing proposals through tenders which are calculated according to exchange rates prevailing at the time of the tender. The pre-transaction risk is in existence only for the life of the bid. For future bids, Asimov may use the then prevailing exchange rates.

Example 11: Bangers GmbH

Bangers GmbH, a euro based car manufacturer, issues a price list in sterling. The price list is valid generally for six months or so but can be withdrawn at any time. However, any new price list cannot contain dreadful shocks to the market, or certainly be more shocking than its competitors. The pre-transaction risk has some timescale attached to it although it is difficult to pin down. At some stage the price list must allow Bangers a reasonable profit.

Example 12: Green Parrot AG

Green Parrot sells chocolate to supermarket and other retailers for eventual sale to the retail market. The end price of chocolate is broadly inflexible, even in the medium term. Green Parrot therefore has essentially unlimited pre-transaction risk.

Example 13: Price lists with commodity risk

Happy Holidays Ltd, a holiday firm with its own aircraft, publishes brochures for the holidays it offers up to a year in advance and in the prices it offers it makes assumptions about fuel price and foreign exchange rates. It has pre-transactional risk.
It may respond to this risk by either hedging part of their expected sales or by imposing surcharges on customers in adverse circumstances. It may also have economic risk to the extent that any price rise (by surcharge or in future brochures) may affect demand.

There is, of course, a fine line between pre-transaction risk and economic risk. It could be argued that economic risk is a better description of the risk facing both Bangers and Green Parrot, as well as the baker.

The starting point for any response to pre-transaction risk has to be to work out how big the risk is to the firm, from evaluation. If there is an enormous margin in the supply of a particular product then any formal response may be unnecessary, but if the particular trade is low margin and forms the bulk of operations then some response is required.

The dimensions of response need to be around:

- forecasts – if tenders or price lists have been issued, then a forecast should also have been made of likely take up by customers.
- time horizon – where the pre-transaction exposure is long some decision needs to be made on where the horizon should sit.

It may be that there is actually little uncertainty in markets. Green Parrot will be able to forecast volume fairly accurately because their market is very large. It is likely that the volume will differ only by say 5-10% each year, allowing considerable certainty. Asimov may know that 7 out of every 10 tenders are successful. In these cases the exposure is more akin to transaction exposure and can be managed that way. Remember, however, that execution of hedging needs to be near in timing to the setting of the intrinsic rate to be effective at reducing risk.

When forecasts are used, a common response by treasurers is to hedge 50% of forecast exposures. There is some underpinning logic in this in that a 50% hedge is a halfway house between either staying fully floating, or going entirely fixed, but generally has no other real logic. Any such decision has to be taken within the context of a risk policy where risk is evaluated and a risk appetite decided and proper measures installed.

Where there is uncertainty, however, then the response becomes more difficult. If Asimov makes few bids, or perhaps one very large bid, then its outcome will not fit a portfolio approach and must be managed on an individual basis. If Bangers GmbH operates in the luxury sector with very high ticket cars, then volume will be uncertain. The only proper response in these cases is to use financial options, because a contingent risk can be responded to with a contingent risk transfer instrument.

In practice, options are used fairly infrequently for pre-transaction exposure, except perhaps in large and long tenders where the margin on the product is quite low.

A good way to think about pre-transaction risk, especially the continuous kind, is that hedging buys time to change the business model if market rates move drastically out of the ranges on which the business model is based.

6.3 Response to economic risk

Economic risk goes to the heart of the business model and the underlying competitiveness of the firm.

Example 14: Rolls Royce plc

Rolls Royce (with many GBP costs) operates in a global market for aircraft and marine engines where the currency of preference is the USD and where competitors are mostly US based, and who therefore have no fundamental economic foreign exchange exposure. The competitiveness of Rolls Royce is about product quality and innovation but it is also about exchange rates. A strong pound makes them less competitive.

Because no amount of hedging lasts forever, the future cash flows of the business beyond any hedging horizon will always be subject to exchange rate or commodity risk. Ultimately there is therefore no risk transfer solution to economic risk. The only thing that can be done is to expect some form of risk reduction which will buy time for the business model to be changed to suit the new circumstances, or for the firm to exit the business model, i.e. avoid the risk.

The response to economic risk is therefore based around the business model itself. We return to a previous example.

Example 15: Economic foreign exchange risk

A Japanese automobile manufacturer competes with a German firm to sell similar cars in the USA. Each has local cost factors, including local wage rates and material costs, but the relative cost would also depend on the value of the yen versus the euro. An appreciation of the Yen against the euro (so that US dollars buy less yen than euros) would make the Japanese firm less competitive. Many non-US automotive manufacturers have set up local manufacturing operations in the US to reduce this risk.

This is possibly classic economic risk but there are other forms.

Example 16: Economic foreign exchange risk

Airhoist GmbH, a European airline has decided to embark on a major capital investment programme, buying around 50 new aircraft, the price of which are denominated in US Dollars. The business model for Airhoist is to collect fares in euro and pay for fuel in US Dollars and aircraft costs in a mix of USD and EUR, depending on whether it buys or leases the aircraft. This is a fundamental economic exposure. The US Dollar has been strengthening and Airhoist decides to buy hundreds of millions of US Dollars to meet the cost of aircraft purchases. The US Dollar subsequently falls and Airhoist is left with aircraft that are more expensive than those of its competitors leading to an inability to properly compete. Ultimately Airhoist had to be recapitalised.

Similar issues can arise with regard to acquisitions and disposals.

As with the uncertainty of pre-transaction risk, so with economic risk; a proper response needs to be based around a risk management framework, with the risk to the firm properly measured, the risk budgeted and the risk responded to with a view to reducing that risk, and with proper controls. Again the contingent nature of risk might properly be responded to with contingent instruments, i.e. financial options.

7 Accounting

When considering some hedge proposal (hopefully as part of a risk management framework where risk is properly measured and budgeted etc.) the question of accounting is almost inevitably raised. Here are some of the reasons for this:

- Management need to know how the proposed transaction will affect the company's published reported position. How will it 'look' on the company's balance sheet and income statement? In particular, what will be the effect on headline measures such as EPS?
- A variety of other measures drive off the accounting numbers. These will affect the market's perception of the company's creditworthiness, and if they are covenant measures, may be very important indeed.
- Dividends are limited by accounting distributable reserves.
- Accounting profit is the main input for tax.

A *very* brief guide to current disclosure and accounting requirements for financial instruments is set out in reading 4.7.1.

Accounting is very important but neither can it rule supreme. There are good arguments that an approach to hedging which protects EPS (for instance) may not add shareholder value. And some companies have found the requirements to achieve hedge accounting so onerous that they have limited or abandoned hedging programmes, possibly destroying shareholder value, but by explaining the policy to shareholders, probably avoiding such a loss.

A key decision in the risk management process is whether to measure risk impact on an accounting measure such as EPS or gearing, or on a cash (and hence economic value) measure. The treasurer must carry the flag for the true economic approach to risk management, while bearing in mind the perils of ignoring the accounting altogether.

Example 17: Accounting
Countup Ltd (a UK company) has some very small export business to Europe. It has the following transaction:

It prices an export to Europe at €120 based on an intrinsic rate of £1 = €1.2. The expected revenue is therefore £100. When this sale has been invoiced it has to be accounted for. The rate when accounted for is £1 = €1.33, thus the invoice value is £90.22. When the currency is collected the rate has moved to £1 = €1.26 and so this amounts to a collection of £95.24. Economically, Countup has £4.76 less than it anticipated, i.e. a loss

However the accounts say that a gain of £5.02 has been made

Hopefully management will identify the economic loss rather than the accounting result and take action to prevent a repetition.

Example 18: Accounting

Yule Catto adopts a three column approach to reporting, identifying underlying performance separately from that of the IFRS result.

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Annual report and accounts 2010

Consolidated income statement

for the year ended 31 December 2010

		2010			2009		
	Note	Underlying performance £'000	Special items £'000	IFRS £'000	Underlying performance £'000	Special items £'000	IFRS £'000
Continuing operations							
Group revenue	4,5	626,765	5,689	632,454	516,712	11,236	527,948
Share of joint ventures' revenue	4,5	19,026	–	19,026	15,450	–	15,450
Total sales		645,791	5,689	651,480	532,162	11,236	543,398
Group revenue		626,765	5,689	632,454	516,712	11,236	527,948
Company and subsidiaries before special items		51,951	–	51,951	48,174	–	48,174
Impairment of goodwill	3	–	–	–	–	(30,000)	(30,000)
Acquisition costs	3	–	(4,182)	(4,182)	–	–	–
Operations sold or closed during the year	4	–	12,303	12,303	–	1,990	1,990
Company and subsidiaries		51,951	8,121	60,072	48,174	(28,010)	20,164
Share of joint ventures	4,5	2,934	–	2,934	1,242	–	1,242
Operating profit/(loss)	5	54,885	8,121	63,006	49,416	(28,010)	21,406
Interest payable	8	(8,266)	–	(8,266)	(10,308)	–	(10,308)
Interest receivable	8	426	–	426	439	–	439
		(7,840)	–	(7,840)	(9,869)	–	(9,869)
Fair value adjustment	3,8	–	2,645	2,645	–	(4,401)	(4,401)
Finance costs		(7,840)	2,645	(5,195)	(9,869)	(4,401)	(14,270)
Profit/(loss) before taxation		47,045	10,766	57,811	39,547	(32,411)	7,136
Taxation	9	(9,095)	6,558	(2,537)	(7,981)	9,065	1,084
Profit/(loss) for the year from continuing operations		37,950	17,324	55,274	31,566	(23,346)	8,220
Discontinued operations							
Profit for the year from discontinued operations	3	–	–	–	–	3,668	3,668
Profit/(loss) for the year		37,950	17,324	55,274	31,566	(19,678)	11,888
Profit attributable to minority interests	26	1,300	4,236	5,536	1,572	630	2,202
Profit/(loss) attributable to equity holders of the parent	26	36,650	13,088	49,738	29,994	(20,308)	9,686
		37,950	17,324	55,274	31,566	(19,678)	11,888
Earnings per share*							
From continuing operations							
– Basic	12	16.2p	5.8p	22.0p	13.3p	(10.7)p	2.6p
– Diluted	12	15.7p	5.7p	21.4p	12.9p	(10.3)p	2.6p
From continuing and discontinued operations							
– Basic	12	16.2p	5.8p	22.0p	13.3p	(9.1)p	4.2p
– Diluted	12	15.7p	5.7p	21.4p	12.9p	(8.7)p	4.2p

Example 19: Accounting versus economics

In late 2011 the troubled Swiss bank UBS announced that recent losses had been offset by a ~$1.5bn accounting gain on the value of its own debt. That is, the market value of UBS' bonds had fallen by $1.5bn, and the movement had been (entirely legitimately) recorded as income.

However, corporate finance theory tells us that Enterprise Value = MVe + MVd

So unless the $1.5bn decrease in the value of UBS' debt has been transferred to shareholders (which seems unlikely), in fact UBS' enterprise value has fallen by $1.5bn, whatever the accounts say.

8 Taxation of risk transfer activity

Taxation issues are dealt with in more detail elsewhere. However for the purposes of this section, some key principles are worth highlighting:

- When setting up a risk management programme, just as in corporate finance applications, you must consider the after tax position.
- Tax and international tax are so complicated that it is nearly always worth getting advice - certainly it is always worth doing research.
- Tax is based on and often directly follows the accounting, so the first step is to get the accounting right.
- Recall that individual legal entities or special 'tax groups' pay tax, not consolidated accounting groups. So although the overall accounting and net cash may work on an aggregated or consolidated basis, the tax treatments may not match.
- Beware of:
  - Income or gains being taxed, but expense or losses not relieved
  - Income or gains being taxed twice or more

9 Peer group behaviour, risks of risk transfer

In some of the examples we have seen about financial risk, we have considered the peer group aspect. This is a very important dimension to financial risk management in trading. Clearly this can get very complicated because different peers may have very slightly different business models or competition between peers is not so much about price as about quality of product or buyer / seller relationships. Indeed foreign exchange or commodity risk may be just one of many risks in the whole supply chain. In some cases sheer ability to supply a product might be persuasive.

It is worth considering this, however, because there is a risk to taking action to reduce risk ('hedging is not riskless'). Broadly, any risk transfer will not eliminate risk but is much more likely to transform it into another risk. This represents the opportunity cost of not being able to benefit from favourable moves in exchange rates and comprises the major cost of hedging or risk transfer of financial risks where markets can go in two directions.

Example 20: Hedging and competition

The market for the supply of side-wound elliptical artificial micro wind generators is made up of just two competitors A Ltd and B Ltd, and the differentiation between them is entirely on price of the product. A key component of the product is the metal antiterribilium, for which a liquid market exists in London. The price of antiterribilium has fallen to the lowest level for 5 years and A Ltd has decided to undertake a hedging programme to take advantage of this low price. It buys sufficient metal for two years production, on the basis that this has reduced the economic risk of commodity fluctuations.

The fact that the price of the metal has fallen to a low does not, of course, mean that it cannot go down further.

If the metal price falls further, then B Ltd has a natural advantage for sales for the next two years. If B then fixes its own price at a lower level than A, then this price advantage is locked in for two years, wherever metal prices move.

If the metal price rises above the lows, then A has a natural price advantage but only for the length of time that the price rises above the hedged level. Any fall below that hands the advantage back to B.

We can see from Example 20 that the outcome of hedging is pure chance. Unless there is market inside knowledge, then hedging may actually increase risk.

Treasurers need to be careful of advising about future market movements. Also in Example 20, there is value in knowing what competitors have done. Knowing the length of the hedging programme undertaken is highly valuable commercial knowledge, and so understanding what competitors have done is an important aspect of research. It also explains why many companies do not wish to disclose risk management strategies - as potentially required by the draft IFRS9.

Of course, if either party in Example 20 had bought an option on the metal then that would put them in a very strong position to compete in every circumstance, but at the expense of a premium. There is a fairly strong message here that unless there is absolute certainty of cash flows and pricing (i.e. transaction exposure) then contingent risks are ultimately best managed with a contingent risk transfer product. The only problem with this is the premium expense.