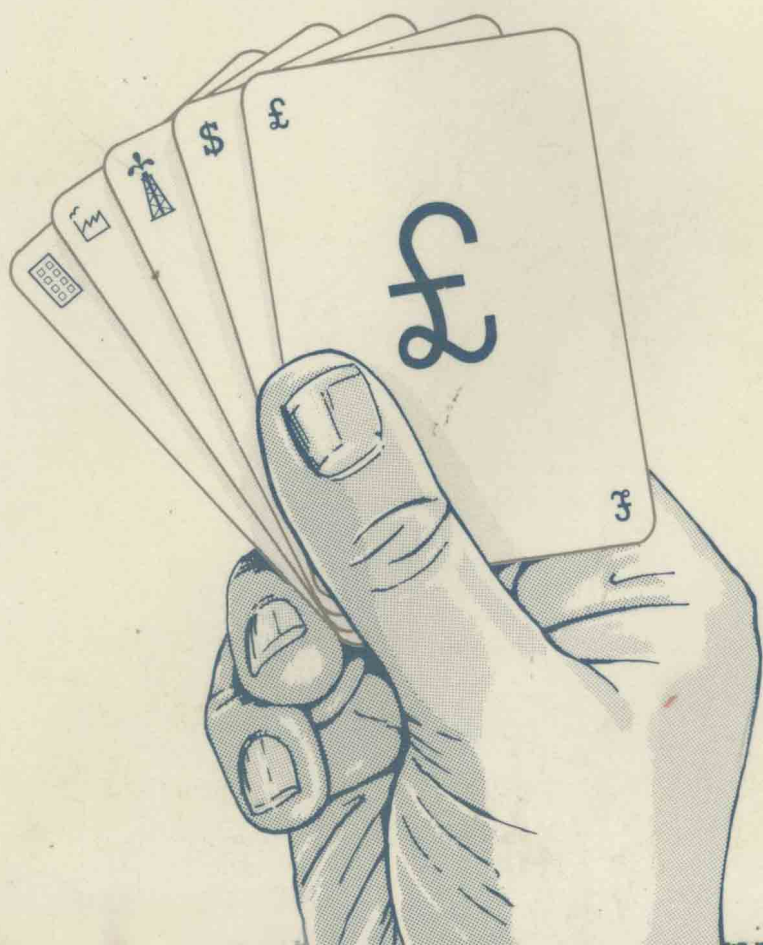


FINANCIAL RISK MANAGEMENT

Keith Redhead and
Steward Hughes



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Gower

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Published by
Gower Publishing Company Limited,
Gower House,
Croft Road,
Aldershot,
Hants GU11 3HR,
England

Gower Publishing Company,
Old Post Road,
Brookfield,
Vermont 05036,
USA

British Library Cataloguing in Publication Data

Redhead, Keith

Financial risk management.

1. Business enterprises—Finance

2. Risk management

I. Title II. Hughes, Steward

658.1'52

HG4026

ISBN 0-566-02652-X

**Printed in Great Britain at the
University Press, Cambridge**

Preface

Businesses of all types face risks arising from fluctuations in exchange rates and interest rates. Adverse movements in these rates can seriously threaten the profitability of enterprises. Similarly, portfolio managers face risks arising from volatility in bond and equity markets.

This book is intended as an introduction to the techniques available for managing these various risks. It is primarily aimed at readers with some familiarity with finance but does not presuppose prior knowledge of exposure management. The emphasis throughout is on hedging rather than arbitrage or speculation (speculation is more usually referred to as 'trading' in this context). However, some attention is paid to these areas since they play crucial roles in the markets concerned.

This book will be of use to those operating in a wide variety of organizations including businesses of all types – manufacturing, service, financial – and public sector bodies such as local authorities. There are very few organizations unaffected by financial instability, and the management of that instability is becoming a vital dimension of financial management.

We have tried to write self-contained chapters that allow the reader to understand individual chapters without having studied the previous ones. The need to avoid excessive repetition inevitably inhibits the full achievement of this objective and the reader must therefore be aware that concepts relevant to one chapter may

be dealt with elsewhere. This is particularly true of the chapters dealing with futures and swaps.

We would like to thank Victor Levy of Arthur Andersen & Co. and Ralph Newns of Spicer and Pegler for their very valuable assistance in the preparation of the chapters on the accounting and taxation aspects, and Jaguar Cars Limited for permission to reproduce material from their magazine *Topics*. Finally, we want to express our gratitude to Mamie and Marjorie who have shown commendable patience in their typing of the manuscript.

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1 Introduction

The 1970s and 1980s have witnessed exchange rate and interest rate volatility greatly in excess of that of earlier periods. The breakdown of the Bretton Woods exchange rate mechanism in the early 1970s, and its replacement by a system of floating exchange rates, has introduced a source of serious uncertainty to business decision-making. There is uncertainty as to the sterling value of future receipts and payments in foreign currency.

Exchange rates have shown increased volatility during the 1980s. Movements in excess of 30 per cent in a year are not unusual. For example, sterling traded at US\$2.40 in 1981, fell to just over \$1.00 in 1985, before swinging back to \$1.50 in 1986. It is arguable that the collapse of one fifth of UK manufacturing industry during the 1979 to 1982 period can largely be ascribed to the loss of markets caused by the strength of sterling. Another severe blow to industry during that period was the upsurge in interest rates. Both the exchange rate and interest rates reached peak levels during the early 1980s subjecting businesses to a destructive pincer movement. The problem of accommodating to exchange rate movements is further exacerbated by the tendency for movements to be abrupt, adjustments to new levels typically occurring within a three-week period.

It is difficult to plan overseas trade and investment when the sterling values of the resulting cash flows cannot be calculated with any confidence. Even otherwise favourable movements may show muted effects if the level of uncertainty is such that businesses

cannot rely on the more favourable rates enduring. Exporters may be slow to react to improvements in competitiveness following a depreciation if they need to be convinced that the international value of the currency is going to stay down.

Very large companies may feel that their geographical spread of trade and investments is so large that they need not worry about currency fluctuations, losses in relation to some currencies being offset by gains on others. This attitude ignores the possibility that a currency can change in relation to others taken in aggregate. Changes in sterling's effective rate (that is the exchange rate relative to a basket of currencies weighted according to each country's importance in UK trade) testifies to this.

The establishment of currency blocs, such as that of the European Monetary System, can remove much of the uncertainty for those countries participating in the arrangements to fix rates of exchange between members. However, risks remain in relation to trading partners outside such arrangements, and even within such systems complete stability of exchange rates is not achieved.

The 1970s also saw a switch in economic policy-making sentiment from Keynesianism, with its preference for a stable interest rate at the expense of an unstable money supply, towards monetarism which asserts the need for money supply control. It is not possible for governments to achieve stability of both interest rates and the rate of growth of the money supply, so instability of interest rates is an inevitable consequence of controlling the money supply. Furthermore, the inter-relationships between domestic and international money markets mean that interest rate volatility causes exchange rate volatility, and vice versa.

Hence businesses now face a financial environment fraught with risk and uncertainty. There is a resultant need for instruments that serve to reduce risk and uncertainty. In other words, there is a demand for techniques for hedging. Hedging involves guaranteeing a future exchange rate or interest rate, or ensuring that losses from adverse movements of such rates are compensated by offsetting gains.

The exposures to exchange rate movements can be subdivided into transaction, translation, and economic exposures. There is a lack of universally accepted definitions of these three types of exposure, in particular with regard to economic

exposure, so the definitions used here are inevitably somewhat idiosyncratic.

Transaction exposure

This can be defined as the possibility of gains and losses from the direct effects of exchange rate movements on anticipated cash flows. An exporter with foreign currency receivables stands to lose from a depreciation of the foreign currency relative to the domestic currency whilst an importer with foreign currency payables would lose from an appreciation of the foreign currency relative to the base currency.

Uncertainties as to the domestic currency value of exports invoiced in foreign currency can inhibit exports, since there is doubt as to whether the exports will ultimately prove to be profitable. Uncertainties about the domestic currency cost of imports priced in foreign currency adds to the risk of importing, since the eventual domestic currency price might prove to be uncompetitive. Exchange rate uncertainty can deter international trade.

Uncertainty of export profitability where sales are invoiced in foreign currency might seem to be escapable by means of pricing in the company's own base currency. However this merely transfers the currency risk to the importer who may consequently turn to suppliers prepared to invoice in the importer's currency. Besides a depreciation of the foreign currency, which undermines the home currency profitability of the exports, has as its counterpart an appreciation of the home currency which raises the foreign currency price of the exports and thereby undermines their competitiveness. This effect would be particularly damaging where demand is very sensitive to price movements. Exporters of motor vehicles, textiles, and alcoholic spirits would be familiar with this type of problem.

A particular example of sales volume uncertainty is when a company tenders for a contract. The company must be aware that a tender in its own currency might put it at a considerable competitive disadvantage, but that a tender in a foreign currency would incur currency risk, which is contingent on the success of the tender. A successful tender involves a currency risk whereas an unsuccessful one does not. This poses particular problems and

it will be demonstrated that currency options are particularly useful for dealing with such contingent risks.

A successful outcome of a tender leads on to further currency exposure. Many civil-engineering contractors operating in the Middle East have found themselves with contract prices denominated in US dollars and costs denominated in other currencies. Such contractors are vulnerable to a weakening of the US dollar and face the particular problem of covering against such an eventuality over a long time span.

Tenders in foreign currency could be looked upon as causing contingent transaction exposures. Often the exposure present with tenders is regarded as a form of economic exposure. That tends to be the case when economic exposure is treated as a residual encompassing all exposures that do not fit easily under the headings of transaction and translation exposure. The definition of economic exposure proposed here does not readily incorporate exposures present with tendering. So use of the description 'contingent transaction exposure' is preferred.

Importers invoiced in foreign currency also face problems of uncertainty as to the home currency cost of the imports. This is particularly problematical if their sales are very sensitive to price movements, as would be the case if they faced competition from domestic producers unaffected by exchange rate changes or from importers invoiced in currencies that show more favourable movements. In the case of high technology goods there is often a choice between the USA and Japan as the source of supply. Differential movements of the US dollar and the yen against sterling affects the relative price competitiveness of the American and Japanese equipment.

The biggest conceptual problem arises in relation to the date on which the transactions exposure begins. One answer might be that it starts on the date of the invoice. What then of orders that have not yet been invoiced? If an exporter has received an order that will be invoiced in foreign currency then there is an exposure from the date of the order, so long as the foreign currency price is settled at the time of the order. What about orders that have not yet been received but are expected? Consider, for example, a British tour operator selling European holidays. He will need to meet hotel expenses in European currencies and is at risk from appreciations of European currencies relative to sterling. Such

appreciations would raise his sterling costs whilst the sterling revenue for each holiday is determined when the price list is produced. Prior to the publication of the price list foreign currency appreciations can be reflected in the prices to be charged. Once the price list is published that is not possible and the tour operator is exposed. So transactions exposure can be regarded as dating from the production of the price list.

The task of identifying transaction exposure might involve evaluating the case in which a trade is priced in one currency but payable in another. There may be doubt as to whether the currency of exposure is the one used for pricing or the one used for payment. The answer is that it is the currency in which the price is expressed. An appreciation of that currency relative to the base currency would increase the price in terms of the base currency. An appreciation of the currency, in which payment is to be made, relative to the base currency that is not accompanied by a corresponding appreciation of the currency used for pricing does not raise the price in terms of the base currency. The higher cost of acquiring the currency of payment per unit (e.g. per \$1) would be offset by the smaller number of units (e.g. dollars) required to match the value of the good or service traded expressed in terms of the currency of pricing.

Translation exposure

This is alternatively known as accounting or balance sheet exposure. It arises from mismatches between assets and liabilities in foreign currencies. For example, if a UK company has a subsidiary in the US it has an asset, the subsidiary, denominated in US dollars. If the company does not have US dollar liabilities sufficient to offset the value of its asset it has an exposure. A depreciation of the US dollar relative to sterling would reduce the balance sheet valuation of the subsidiary, since the balance sheet of the parent company would be expressed in sterling. Likewise a company with net liabilities in a currency would be at risk from an appreciation of that currency. For example a company may have raised a loan in Swiss francs, attracted by low Swiss interest rates, and then sold the francs for sterling so as to finance a UK based investment. The balance sheet would show an increase in the sterling value of

liabilities in the event of the Swiss franc appreciating relative to sterling.

The question arises as to whether translation exposure is important. If it is felt to be of no real significance then the company need not seek to hedge the exposure. It might be argued that the balance sheet variations in the base currency valuations of assets and liabilities are paper adjustments with no real significance. The fact that the sterling value of the subsidiary in the US fluctuates with the gyrations of the US dollar/sterling exchange rate may have no impact on the operation or profitability (in US dollars) of the subsidiary. So the costs involved in hedging the translation exposure might be regarded as pointless since there is no real risk from currency movements. This point of view is valid if exchange rate movements are seen as fluctuations around essentially constant rates. However if there is an underlying trend in an exchange rate the trend may be of real significance even though fluctuations around it may not. A long-run tendency for the US dollar to fall relative to sterling would be of real significance to the parent company. Even if the depreciation of the dollar has no effect upon the operation of the subsidiary the sterling value of the future stream of profits accruing to the parent from the subsidiary would decline and it is appropriate that such a decline should be reflected in the parent company's balance sheet valuation of the subsidiary. Such a decline in the sterling value of the subsidiary is of real significance to the parent company which may feel that some currency hedging may be necessary.

Ignoring exchange rate fluctuations around a basically constant long-run rate might be appropriate in the case of assets such as subsidiary companies since such assets are long lasting, and may even be treated as everlasting. Shorter-lived assets pose the problem that their maturity dates could coincide with particularly unfavourable exchange rates. Foreign currency liabilities are likely to be subject to such risks. Debts may have maturity dates without roll-over facilities. Even if the sterling/US dollar exchange rate merely fluctuated around a constant long-run level it would be unfortunate for the UK borrower of US dollars if repayment fell due when the dollar was particularly strong against sterling. Assets and liabilities that cannot be treated as being perpetual, particularly when they have inflexible maturity dates, do provide exposures with real significance for companies. It would seem appropriate

that serious consideration be given to hedging the currency risks arising from such translation exposures.

Economic exposure

Economic exposure will be defined here as exposure to the effects of exchange rate movements on the economic environment of the company such that the volume of turnover is affected or the prices of its domestic inputs or outputs change relative to other prices within the domestic economy. The effects might arise from changes in the degree of competition, both from producers of similar goods and from producers of other goods, to or from which consumers might switch their expenditure. The effects might also arise from other sources, such as government policy reactions to movements in currency values or pressure on wages arising from price inflation caused by currency depreciation.

A company whose costs are entirely in domestic currency, has no alternative sources of inputs that might be affected by exchange rate changes, sells only in the domestic market, and faces no competition from products whose prices could be affected by exchange rate changes is the most immune from economic exposure. However, such a company is not totally immune since exchange rate changes might have effects that no firm could avoid. For example, a declining international value of sterling could lead to a rise in interest rates which reduces the general level of expenditure within the economy and increases the cost of servicing debts.

Exchange rate movements can affect the degree of competition from other producers by affecting their cost structures or their local currency selling prices. A company selling entirely in the domestic market with costs arising only in domestic currency would suffer from an appreciation of the domestic currency since competing imports would be cheaper as would the goods from domestic competitors whose costs are partially in foreign currencies.

Changes in the international value of a country's currency can have additional significance for a company locating a subsidiary in that country with a view to providing a cheap source of supply to either the home market of the parent or to other customer countries. For example, a Japanese car manufacturer establishing a plant in the UK with a view to providing competitively priced cars

to European markets would not be pleased to see an appreciation of sterling against the other European currencies.

Some commodities are conventionally priced in particular currencies. The pricing of oil in US dollars is a notable example. Companies with revenues in other currencies can be vulnerable to appreciations of the US dollar against the currency or currencies in which they receive their revenue. Airlines is one example of this type of exposure. If they have also bought aircraft from American manufacturers and have resulting US dollar liabilities there is a further exposure to appreciations of the dollar relative to the currencies in which revenues are received.

It was mentioned earlier that transaction exposure might be regarded as existing from the date of publication of the price list. Suppose that an exporter attempts to avoid the transaction exposure arising from prices in foreign currency by issuing a price list, to foreign buyers, in the seller's home currency. The effects of exchange rate movements would then show up in volume terms. Whilst an appreciation of the domestic currency would not now reduce the domestic currency value of exports receipts, per unit of exports, it would tend to reduce the volume of exports since foreign currency prices would have risen.

Hidden exposures

There may be transaction, translation and economic exposures that are not apparent at first sight. For example, a domestic supplier may use imported inputs so that a company using that supplier has an indirect transaction risk, since a rise in the costs of the supplier, arising from domestic currency depreciation, could cause that supplier to raise the prices that it charges to its customers. Another example might be the case of an importer that is invoiced in domestic currency but finds that the prices are varied by the foreign supplier to reflect exchange rate movements so as to maintain constant prices in terms of the currency of the foreign supplier.

Hidden transaction and/or translation exposure can arise in the case in which a foreign subsidiary faces its own exposures. Suppose that a US subsidiary of a UK parent company exports to Australia. The US subsidiary may face an Australian dollar