A Guide to the London Precious Metals Markets

Please note the 'Guide' was published in 2008. As of May 2016 it is being updated and a new version will be available soon.

LBMA

The London Platinum & Palladium Market

Contents

Preface

This guide to the London precious metal markets was produced and is published jointly by the London Bullion Market Association ("LBMA") and the London Platinum and Palladium Market ("LPPM"). It updates the previous guide issued by the LBMA in 2001 (which covered the markets for gold and silver bullion) and extends the coverage to include platinum and palladium. The publishers are pleased to acknowledge the contribution of Douglas Beadle to the preparation of the text describing the platinum and palladium markets.

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Introduction

The Members of the London Bullion Market Association (LBMA) and the London Platinum and Palladium Market (LPPM) offer an unparalleled range of facilities and products for the trading of gold and silver (collectively referred to as "bullion") and platinum and palladium (collectively with bullion referred to as "precious metals"). The London precious metals markets operate on a principal-to-principal basis and have an international client base with a wide diversity of interests.

The purpose of this Guide is to explain the operation of the London precious metals markets. It defines the principles upon which the markets operate, describes the facilities and products that are available, explains the way in which transactions are quoted and conducted and indicates the type of clients for whom the products may be appropriate. The credit risk or exposure involved between dealer and client in using individual products is also examined.

The Guide also introduces potential users to the marketplaces and the roles of the LBMA and the LPPM. It covers the support facilities of vaulting and clearing, the regulatory regime under which the markets operate and the standard documentation that supports them. Finally, it points to useful sources of further information. As an aid, a glossary of some commonly-used market terms is included as Appendix 1.

The London Bullion Market Association

The LBMA is a trade association that acts as the co-ordinator for activities conducted on behalf of its Members and other participants in the London bullion market.

It acts as the market's principal point of contact with regulators and other official bodies, such as HM Revenue and Customs. It ensures the continued evolution and health of a marketplace for gold and silver in which all participants can operate with confidence. A primary function of the LBMA is its involvement in the promotion of refining standards by maintenance of the London Good Delivery List. In 2004, the LBMA introduced Proactive Monitoring, which includes independent testing of the assaying ability of the refiners on the List on a three-year rolling programme.

Further it promotes good trading practices and develops standard documentation as appropriate. The LBMA also liases, as necessary, with London Precious Metals Clearing Limited (LPMCL), which organises and co-ordinates bullion clearing and vaulting in the London Market and develops standard documentation appropriate to these activities (see also **Support Facilities**).

The Members

The broad-based membership of the LBMA includes commercial banks, fabricators, refiners, transport companies and brokers. These companies provide facilities for the trading, refining, melting, assaying, transporting and vaulting of gold and silver bullion. Full membership is open to companies and other organisations actively engaged in these activities in the London market. There are two categories of full membership: Members and Market Making Members. Non-market-making Members are usually referred to as ordinary Members.

Market Making Members are required to quote prices to each other upon request throughout the London business day in any combination of the three main product categories – spot, forwards and options – in both gold and silver.

As an Alternative to full membership, companies which though not actively involved in the London bullion market, undertake activities relevant to it, may be affiliated to the LBMA as Associates.

The current membership list is available on the LBMA website, www.lbma.org.uk or from the Association at 13/14 Basinghall Street, London EC2V 5BQ.

Market History

Records trace bullion transactions in London back to the 17th century with the formation of the oldest original member of the market, Mocatta and Goldsmid, in 1684. It was, however, the introduction of the London Silver Fixing in 1897 and the London Gold Fixing in 1919 that marked the beginnings of the market's structure and of the co-operation between members that has created the marketplace as it is today.

The five members of the London Gold Fixing dominated the UK marketplace until 1980 when gold soared to $850 per ounce and silver to over $50 per ounce, fuelled by oil price inflation and spiralling international tension. The level of activity and profitability, combined with increasing global attention, resulted in an influx of international players to London and set the market on course to become the centre of the international arena that it is today.

The growth in the number and type of market participants in the early 1980s, combined with the introduction of the Financial Services Act in 1986, brought about the formation of the LBMA on 14 December 1987.

The London Platinum and Palladium Market

The LPPM is a trade association that acts as the co-ordinator for activities conducted on behalf of its Members and other participants in the London market.

It acts as the principal point of contact between the market and regulators / other official bodies such as HM Revenue and Customs. It ensures the continued evolution and health of a marketplace for platinum and palladium in which all participants can operate with confidence. A primary function of the LPPM is its involvement in the promotion of refining standards by maintenance of the LPPM Good Delivery List and it plans to introduce, hopefully in the second half of 2008, a regime of Proactive Monitoring whereby refiners on the LPPM Good Delivery List will, under a three-year rolling programme, have their assaying ability independently tested in addition to being required to provide the LPPM, in confidence, with certain production and financial data.

The Members

There are two categories of membership of the LPPM, namely Full and Associate Members, in addition to which there is Affiliation for those organisations that do not qualify for membership.

Full membership of the LPPM is open to those companies in the United Kingdom that are recognised by the Management Committee as being currently engaged in trading and dealing platinum and palladium and also as being providers of additional services in the United Kingdom market such as market making, clearing services, refining or manufacturing. All Founder Members of the LPPM are Full Members.

Associate membership is open to companies in the United Kingdom that are recognised by the Management Committee as being currently engaged in trading and dealing in platinum and palladium and have an appropriate level of experience and net assets but do not offer the full range of services provided by Full Members.

Affiliation is open to those companies which fail to meet the normal requirements of Full or Associate membership as above but are recognised by the Management Committee as being involved with or offering support to the global platinum and palladium markets.

Market History

Platinum and palladium have a very recent history, unlike gold and silver, which have been known since the earliest civilisations. Platinum was only categorised as a precious metal in 1751 and palladium was isolated as a separate metal less than 200 years ago. In this relatively short period, and despite only limited availability, they have made major contributions to modern scientific progress.

London has always been an important centre for metals. Trading was established in the early decades of the last century, usually alongside longer established bullion trading.

In 1973 the London Platinum Quotation was introduced and a Palladium Quotation was introduced subsequently. This was the forerunner of the Fixings, a twice-daily indication of the market price for spot platinum, reported by some of the principal companies dealing in the metal.

In 1979 the leading London and Zurich dealers reached an agreement to standardise the specifications and provenance of metal that they would accept as good delivery.

In 1987 the informal trading that had taken place for many years on a principal to principal basis was formalised via a Deed of Establishment into the London Platinum and Palladium Market.

In 1989 the London Platinum and Palladium Quotations were expanded and upgraded to full Fixings.

An Over the Counter Market

Members of the London precious metals markets trade with each other and with their clients on a principal-to-principal basis, which means that all risks, including those of credit, are between the two parties to a transaction. This is known as an “Over the Counter” (OTC) market as opposed to an exchange traded environment. While transactions between members tend to be in standard dealing amounts, when dealing with clients, a dealer will provide a tailor-made service – offering quotes for variable quantities, qualities and types of precious metal as well as for various value dates and delivery destinations.

The London precious metals markets are wholesale markets, where minimum traded amounts for clients are generally 1,000 ounces of gold, 50,000 ounces of silver, 1,000 ounces for both platinum and palladium when traded in the telephone market or 500 ounces for each when traded in the electronic market.

Unlike a futures exchange, where trading is based around standard contract units, settlement dates and delivery specifications, the OTC market allows flexibility. It also provides confidentiality, as transactions are conducted solely between the two principals involved.

What sets London Apart?

Two features combine to create a unique marketplace for precious metals in London.

London Good Delivery (LGD) Historically, the members of the London bullion market compiled lists of accredited melters and assayers whose gold and silver bars they would accept without question, in settlement against transactions conducted between each other and with other acceptable counterparties. Such bars earned the distinction of London Good Delivery status. Likewise the LPPM has its London / Zurich Good Delivery List for platinum and palladium plates and ingots that are accepted without question in settlement of transactions conducted in the market.

Today, refiners of gold and silver have to satisfy the Physical Committee of the LBMA that their bars meet the stringent requirements set by the Association, whilst refiners of platinum and palladium have to similarly satisfy the Management Committee of the LPPM. LBMA and LPPM Good Delivery accreditation has become the internationally accepted standard of product and refinery quality.

Given the status that Good Delivery has attained, both the LBMA and the LPPM take very seriously the assessment of applications for inclusion in their Good Delivery Lists. The ongoing review and maintenance of these Lists is one of the core functions of both Associations.

In 2004, the LBMA introduced Proactive Monitoring, a system of monitoring the quality of the production and assaying ability of refiners on the Good Delivery List as well as their financial status and recent production history. This involves refiners providing on request a dip sample from a normal production melt, which is check-assayed by one of the LBMA's referees. Special arrangements apply to gold refiners which only produce and market "four-nines" gold. Normally refiners are subject to monitoring once every three years.

Details of the standards required for inclusion on the LBMA London Good Delivery List are published by the LBMA in the "Good Delivery Rules for Gold and Silver Bars". The List itself is available on the LBMA web site or from the Association. The LPPM also publishes its procedures for inclusion on its Good Delivery List for Platinum and Palladium Plates and Ingots, which is available on the LPPM website.

Loco London is a concept that is perhaps the most important aspect of the London bullion market as it represents the basis for international trading and settlement in gold and silver. As with London Good Delivery, it has evolved over time.

In the second half of the nineteenth century, London developed as the centre through which gold from the mines of California, South Africa and Australia was refined and then sold.

With this business as a base, and supported by the increasing acceptance of the London Good Delivery List, London bullion dealing houses established global client relationships. These clients opened bullion accounts with individual London trading houses. It soon became evident that these "loco London" accounts, while used to settle transactions between the bullion dealer and client, could also be used to settle transactions with other parties by transfers of bullion in London. Today, all such third party transfers on behalf of clients of the London bullion market are effected through the **London Bullion Clearing,** which is organised and administered by the London Precious Metals Clearing Limited.

As a result, the loco London price has become the common denominator amongst dealers around the world. The settlement process can be likened to that in international foreign exchange markets, where settlement is effected by debits and credits over currency nostro accounts in the relevant banking systems.

A credit balance on a loco London account with an LBMA member represents a holding of gold or silver in the same way that a credit balance in the relevant currency represents a holding of dollars on account with a New York bank or yen with a Tokyo bank. In fact, because of these advantages, nearly all global OTC gold and silver trading is cleared through the London bullion market clearing system.

The platinum and palladium markets operate on a very similar basis, except that delivery may be effected on either a loco London or Zurich basis, although Zurich is the principal settlement location.

Market Basics

Trading Unit

For gold, this is one *fine* troy ounce and for silver, platinum and palladium one troy ounce. The significance of this differentiation is that in the case of gold, the unit represents pure gold irrespective of the purity of a particular bar, whereas for silver, platinum and pallladium it represents one ounce of material, of which a minimum of 999 parts in every 1,000 will be silver and 999.5 parts in every 1,000 will be platinum or palladium. **Fineness** is a measure of the proportion of gold or silver in a bullion bar or platinum or palladium in a plate or ingot and is expressed in terms of the fine metal content in parts per 1,000. It therefore defines the purity of a gold or silver bar or platinum or palladium plate or ingot. **Assaying** is the process by which fineness is determined. The purity of silver, platinum and palladium articles is often quoted in the form of fineness – for instance, sterling silver is 925 fine. On the other hand, the fineness of gold jewellery is usually expressed in carats (parts of fine gold per 24). Eighteen-carat jewellery is therefore 750 fine in bullion market terms.

Troy Ounce

The traditional unit of weight used for precious metals. The term derives from the French town of Troyes, where this unit was first used in the Middle Ages. One troy ounce is equal to 1.0971428 ounces avoirdupois. In the bullion market, all references to ounces mean troy ounces.

Where one kilogram is equal to 32.1507465 troy ounces, the accepted conversion factors between troy ounces and metric units become:

1000 grams	=	32.1507465 troy ounces
1 gram	=	0.0321507465 troy ounces

Therefore

1 troy ounce	=	((1 / 32.1507465) X 1,000)
	=	31.1034768 grams

As examples therefore:

200 grams divided by
31.1034768 = 6.430 troy ounces
or:
100 troy ounces divided by 0.0321507465 = 3,110.348 grams

Unit for Delivery of Loco London Gold

This is the London Good Delivery gold bar. It must have a minimum fineness of 995.0 and a gold content of between 350 and 430 fine ounces with the bar weight expressed in multiples of 0.025 of an ounce (which is the smallest weight used in the market). Bars are generally close to 400 ounces or 12.5 kilograms. The LBMA document *The Good Delivery Rules for Gold and Silver Bars* describes the rules for weighing bars and how the numbers can be rounded. Gold bars are weighed using a beam balance. When weighing a gold bar, it must 'turn the scale' when the correct weight is placed on the scale: this means that the indicator needle on the beam balance moves at least two divisions of 0.001 ounce each in favour of the bar. If a bar does not 'turn the scale,' then the recorded weight is reduced by 0.025 of an ounce.

Fine Gold Content

This is the actual quantity of pure gold in a bar and is expressed to three places of decimals. The fine gold content is thus calculated by multiplying the recorded gross weight by the fineness (to one place of decimals). Rounding of the third decimal in the resulting figure is allowed if the fourth decimal (prior to any rounding) is a 9. For example, a Good Delivery bar with a gross weight of 404.075 ounces and a fineness of 995.8 would contain a net weight of gold or fine gold content of 402.377 fine ounces (404.075 x 0.9958 = 402.377885; no rounding up). On the other hand, if the same bar had a fineness of 999.5, the fine gold content would be 403.873 fine ounces (404.075 x 0.9995 = 403.8729625; rounding up the third decimal, as the fourth is a 9).

Unit for Delivery of Loco London Silver

This is the London Good Delivery silver bar. It must have a minimum fineness of 999 and a weight range between 750 and 1,100 ounces, although it is recommended that ideally bars should be produced within the range of 900 to 1,050 ounces. Bars generally weigh around 1,000 ounces. For silver bars, the bar weight is expressed in multiples of 0.1 of an ounce (which is the smallest weight used for a beam balance). Suitable electronic scales can also be used. When using a beam balance, the bar must 'turn the scale' when the correct weight is placed on the scale: this means that the indicator needle on the beam balance moves at least two divisions of 0.002 ounce each in favour of the bar. If a bar does not 'turn the scale,' then the recorded weight is reduced by 0.1 of an ounce.

Both gold and silver Good Delivery bars must conform to the specifications for Good Delivery set by the LBMA.

Other Bullion Bars

A variety of smaller exact weight bars is available for sale to wholesale clients in addition to Good Delivery bars. For example, a kilo bar weighs just that – one kilogramme (which is, strictly, 32.1507465 ounces). The fine gold content of exact weight gold bars is determined by their fineness. For example, it is accepted as a convention that a kilo bar of fineness 999.9 contains 32.148 ounces of fine gold. A client pays only for the fine gold content.

Silver kilo bars are produced and sold as one kilo of 999 fine silver.

A list of standard small bar types and weights available in the market, together with their troy weight equivalent and fine gold content appears at the end of the Guide.

Unit for Delivery of Loco London / Zurich Platinum and Palladium

This is the Good Delivery platinum or palladium plate or ingot. It must have a minimum fineness of 999.5 and a weight of between 1 kilogram (32.151 troy ounces) and 6 kilograms (192.904 troy ounces). The weight of the plate or ingot if in grams must be expressed to one decimal place and if in troy ounces to three decimal places.

Both platinum and palladium Good Delivery plates or ingots must conform to the specifications for Good Delivery set by the LPPM.

Currency Unit

The market is generally quoted in US dollars per ounce. Quotations in other currencies are available upon negotiation. In addition to a US dollar price, the London Gold, Silver, Platinum and Palladium Fixings offer benchmark prices in both pounds sterling and euros

Settlement and Delivery

The basis for settlement of the loco London bullion quotation is delivery of a standard London Good Delivery bar at the London vault nominated by the dealer who made the sale, whereas for platinum or palladium the basis for settlement is delivery of a standard Good Delivery plate or ingot at the London or Zurich vault nominated by the dealer who made the sale.

While currency settlement or payment for a transaction will generally be in US dollars over a dollar account in New York, delivery of metal against transactions in gold, silver, platinum and palladium are in practice made in a number of ways. These include physical delivery at the vault of the dealer or elsewhere, by credit to an 'allocated account' (see below) or through the London Bullion Clearing or the London / Zurich Clearing to the 'unallocated account' (see below) of any third party.

In addition to delivery at its own vault, a dealer may, by agreement, arrange delivery of physical metal to any destination around the world and in any form of bar, plate or ingot size or fineness. Many dealers maintain **consignment stocks** of physical bullion around the world to facilitate efficient and speedy delivery in active bullion centres.

Allocated Accounts

These are accounts held by dealers in clients' names on which are maintained balances of uniquely identifiable bars, plates or ingots of metal 'allocated' to a specific customer and segregated from other metal held in the vault. The client has full title to this metal with the dealer holding it on the client's behalf as custodian. To avoid any doubt, metal in an allocated account does not form part of a precious metal dealer's assets. Insurance for allocated metal can be arranged by the client or by the precious metal dealer.

Clients' holdings will be identified in a **weight list** of bars, plates or ingots showing the unique bar, plate or ingot number, gross weight, the assay or fineness of each bar, plate and ingot and, in the case of gold, its fine weight. Credits or debits to the holding will be effected by segregation of bars, plates or ingots to or from the client's segregated holding. An allocated account cannot, by definition, be overdrawn.

Unallocated Accounts

These represent the most straightforward and hence most popular way of trading, settling and holding gold, silver, platinum and palladium and are the cornerstone of the loco London mechanism for bullion and the loco London / Zurich mechanism for platinum and palladium. The units of these accounts are one fine troy ounce of gold and one troy ounce of silver, platinum or palladium based upon a 995 fine LGD gold bar, a 999 fine LGD silver bar or a 999.5 GD platinum or palladium plate or ingot.

The simplicity of this arrangement is reflected in the fact that transactions may be settled by credits or debits to the account while the balance represents the indebtedness between the two parties. Credit balances on the account do not entitle the creditor to specific bars of gold or silver or plates or ingots of platinum or palladium but are backed by the general stock of the precious metal dealer with whom the account is held: the client in this scenario is an unsecured creditor. Alternatively, a negative balance will represent the precious metal indebtedness of the client to the dealer in the case where the client has a precious metal overdraft facility. Should the client wish to receive actual metal, this is done by "allocating" specific bars, plates or ingots or equivalent precious metal product, the metal content of which is then debited from the unallocated account. For clients, market convention is that precious metal may be allocated on the day on which it is called for, with physical metal generally available for collection within two days. This time frame can be shortened or lengthened by mutual agreement depending upon amount and prevailing market conditions.

To take the analogy of simple currency bank accounts, precious metal bars, of any form, may be drawn down, or allocated, from an unallocated account in just the same way that bank notes with specific unique numbers may be drawn out of a bank checking account.

Market Conventions

Trading Hours

Market Making Members of the LBMA and Full Members of the LPPM provide continuous two-way bid and offer quotations in precious metals for spot, outright and swap forwards and deposits or leases during the London business day.

Marketable Amounts

In the spot market, the standard dealing amounts between Market Makers / Full Members are 5,000-10,000 fine ounces in gold and 100,000-200,000 ounces in silver, 1,000 ounces for platinum and palladium in the telephone market and 500 ounces for platinum and palladium in the electronic market. On request, dealers are willing to offer clients competitive prices for much larger volumes.

In the forward market, subject to credit limits, Market Makers / Full Members quote for at least 50,000 fine ounces for gold swaps versus US dollars, and for at least one million ounces of silver up to one year. In respect of platinum and palladium, the minimum quote is for 5,000 ounces.

Market Regulation

As far as the London bullion market is concerned, regulation falls under two categories, the companies involved and the market itself.

Responsibility for the regulation of the major participants in the London bullion market lies with the Financial Services Authority (FSA) (website: **www.fsa.gov.uk**) under the Financial Services and Markets Act 2000.

Under this Act, all UK-based banks, together with other investment firms, are subject to a range of requirements including capital adequacy, liquidity and systems and controls.

Conduct of business in the London bullion market however falls under two jurisdictions dictated by the type of business. The FSA is responsible for "investment business" as defined under the Act, which, for the bullion market, covers derivatives. The requirements upon firms in their dealings with market professionals are set out in MiFID, the Markets in Financial Instruments Directive, which became effective on 1 November 2007.

For spot, forwards and deposits in gold and silver, which are not covered by the Act, guidelines for the conduct of business are set out in *The London Code of Conduct for Non-Investment Products*, the NIPs code. This code has been drawn up by market practitioners representing the foreign exchange, money and bullion markets in conjunction with the Bank of England. It sets out the standards of conduct and professionalism expected between market practitioners with each other and with their clients.

The principal-to-principal platinum and palladium market is not in itself FSA regulated, although some of the participants may be regulated to the extent that they trade in platinum and / or palladium derivative products or they need to be FSA regulated by virtue of other aspects of their business.

Dealing and Products

Users of the London Precious Metals Markets

Clients served by the Members of the LBMA and LPPM include:

- Primary producers of gold, silver, platinum and palladium wishing to refine or market their product, or who seek price risk protection through forward or option hedging. Such transactions may be linked to project finance for future mining ventures.

- Fabricators, including the global jewellery industry, which over the last decade has absorbed on average just over eighty per cent of all gold consumed each year. These clients may seek low-cost inventory finance for both their stocks of raw materials and finished products.

- Central banks and other long-term holders of gold seeking to actively manage their gold holdings. Gold placed with the market represents “gold liquidity”, which can be used to meet the financing needs of producers, refiners, fabricators and other clients.

- Investors, fund managers or speculators who may wish to deal in the spot market, or who are perhaps seeking a more geared exposure to precious metal prices via forwards or options.

Contact details for LBMA and LPPM Members are available from the LBMA and LPPM websites.

Dealing Basics

Market Making Members of the LBMA provide two-way bid and offer quotations in gold and silver for spot, outright and swap forwards, options and deposits or loans. Gold interest rate derivative products are also offered. Full members of the LPPM provide two-way bid and offer quotations in platinum and palladium for spot, outright and swap forwards and some quote for options. Business is generally conducted via telephone or over electronic dealing systems.

Dealings may be conducted either via the two way bid and offer market which is available from Market Makers of the LBMA or Full Members of the LPPM throughout the London trading day or at the daily London Gold, Silver, Platinum or Palladium Fixings (see below).

The Loco London Spot Price for Gold and Silver and the Loco London / Zurich Spot Price for Platinum and Palladium

These are the bases for virtually all transactions in gold, silver, platinum and palladium. They are quotations made by dealers based on US dollars per fine ounce for gold and US dollars per ounce for silver, platinum and palladium. For gold, silver, platinum and palladium **settlement and delivery** is two good business days in London (or Zurich as the case may be) after the day of the deal. **A good business day** is one in which banks are open in London (or Zurich as appropriate). If the “normal” spot value date falls on a day when the New York US$ clearing system is closed, then the spot day moves forward one day. A list of future value dates for bullion may be found on the LBMA website (**www.lbma.org.uk**), whilst a list of future dates for platinum and palladium may be found on the LPPM website (**www.lppm.org.uk**).

From the basis price, dealers can offer material of varying fineness, bar size or form (for example grain or sponge) at premiums to cover the costs of producing such products. Precious metals can then be shipped to destinations around the world at prices inclusive of freight and insurance subject to negotiation. Dealers also offer quotations for precious metals in other currencies, based on the US dollar price and currency cross-rates. Prices in some local markets for some products may be at a discount to London (or Zurich as appropriate) – reflecting demand and supply dynamics.

Quotations

Market Makers of the LBMA and Full Members of the LPPM offer a two-way spread in precious metals to their clients and to other Market Makers or Full Members during the trading day. They thus provide the dealing liquidity upon which the markets are based and through which client trades are absorbed into the market. For example, in making a gold price, the dealer may quote $695.50 – $696.00, where $695.50 represents the bid price the dealer will pay for gold and $696.00, the offer price at which the dealer sells gold. The size of the spread – the difference between bid and offer – is dependent on market volatility and transaction size, among other factors.

Settlement Credit Risk

Since London is normally five hours ahead of New York and the cut-off time for loco London bullion transfer instructions is 4.00 pm, credit exposure arises between the parties to a bullion spot transaction against US$. The seller of bullion will not have absolute confirmation that the countervalue in currency has been received in his New York US$ account before having to release the bullion to his counterpart in London. This credit risk is similar to that created by settlement of an FX transaction, for example euros vs. US dollars. The cut-off time for loco London / Zurich platinum and palladium transfers is 3.00 pm London time with most transfers being effected on a loco Zurich basis.

The London Gold, Silver, Platinum and Palladium Fixings

In addition to the two-way bid and offer quotations available in the OTC market, London is home to the unique services of the London Gold, Silver, Platinum and Palladium Fixings. The guiding principle behind the Fixings is that all business, whether for large or small amounts, is conducted solely on the basis of a single published Fixing price. Clients around the world wishing to buy or sell precious metals may all do so at the Fixing price, upon which a small commission is generally charged. These fully transparent benchmarks are globally accepted as the basis for pricing a variety of transactions, including industrial contracts and averaging business. They may also be used as a basis for cash-settled swap and option transactions. Orders executed at the Fixings are conducted as principal-to-principal transactions between the client and the dealer through whom the order is placed.

The Gold Fixing

There are five members of the Gold Fixing – all of whom are Market Making Members of the LBMA. The Fixing is conducted by telephone twice each London business day at 10.30 a.m. and 3.00 p.m. Clients place orders with the dealing rooms of Fixing members, who net all orders before communicating the net interest to their representative at the Fixing. The gold price is then adjusted up and down until sell and buy orders are matched, at which point the price is declared "fixed" and all orders are executed on the basis of that price. Transparency at the Fixing is served by the fact that customers may be kept advised of price changes, together with the level of interest, while the Fixing is in progress and may cancel, increase or decrease their interest dependent upon this information.

The chairmanship of the Fixing rotates annually among the member firms. As at June 2008, the Fixing members are The Bank of Nova Scotia–ScotiaMocatta, Barclays Capital, Deutsche Bank AG London, HSBC Bank USA NA London Branch and Société Générale.

The Silver Fixing

Three Market-Making Members of the LBMA conduct the Silver Fixing meeting under the chairmanship of The Bank of Nova Scotia– ScotiaMocatta by telephone at 12.00 noon each working day. The other two members of the Silver Fixing are Deutsche Bank AG London and HSBC Bank USA NA London Branch. The process then follows a similar pattern to gold, arriving at a fixing price when buying and selling orders are matched.

The Platinum and Palladium Fixings

The Platinum and Palladium Fixings are currently conducted by four Full Members of the LPPM by telephone at 9.45 am and 2.00 pm each working day under the chairmanship of Standard Bank. The other LPPM Fixing members are Engelhard Metals, Goldman Sachs International and HSBC Bank USA NA London Branch. The process then follows a similar pattern to the gold, arriving at a fixing price when buying and selling orders are matched.

Fixing prices for gold, silver, platinum and palladium are published immediately by the various news agencies. Historical data for Gold and Silver Fixings may be found on the LBMA website (www.lbma.org.uk) whilst Platinum and Palladium Fixing data may be obtained from the LPPM website (**www.lppm.org.uk**).

Borrowing, Lending and Forward Transactions

Three types of transaction provide the basic tools for risk management of precious metals liquidity: loans and deposits, forward swaps and outright forwards. These also represent the building blocks for a variety of additional products.

Just like currency, precious metals may be placed on deposit to earn interest. In the precious metals markets, such transactions are sometimes referred to as **lease transactions**, and generically the interest rates applied to such lending of precious metals are often referred to as **lease rates**.

The terms lending and borrowing are naturally applied to loans and deposits. However, as is explained below, they are also, somewhat confusingly, used when discussing forward swap transactions.

Quotations for outright forward purchases or sales are sought by investors or speculators seeking exposure to precious metals prices, or by producers and consumers seeking protection from adverse price movements. Forward swaps, on the other hand, tend to be the transactions of professional dealers laying off outright forward transactions and adjusting or positioning their forward books.

Outright forwards and swaps are inextricably linked, as are both products with lease rates. These concepts are explained more fully later in this Guide on page 17.

In common with the majority of currencies, it is market convention to use the 360-day basis in calculating loan and deposit interest as well as forward premiums.

Precious Metals Loans and Deposits

In value terms, most leasing business is conducted in gold. The lending of gold by central banks and other long-term holders provides the liquidity for operations such as hedging structures and inventory loans (see page 25). In silver, where there is little or no such source of liquidity, lease demand must be satisfied from the forward swap market or other reserves. Platinum and palladium leasing is a popular strategy used mainly by industrial customers who would like to have the comfort of locking in a lease fee for a certain period of time without the exposure of spot price volatility. Liquidity for platinum and palladium leasing is obtained from natural lenders and those who have the appetite to hedge metal on a forward basis.

Market convention is for the interest payable on loans of precious metals to be calculated in terms of ounces of metal. These ounces are then generally converted to US dollars, based upon a US dollar price for the metal agreed at the inception of the lease transaction.

Interest therefore equals: $$\mathbf{B} \times \frac{\mathbf{R}}{\mathbf{100}} \times \frac{\mathbf{d}}{\mathbf{360}} \times \mathbf{P}$$

Where:

B	=	Ounces of precious metal
R	=	Lease rate
d	=	Number of days
P	=	Price of precious metal agreed for calculation of interest.

For loans lasting longer than one year, interest coupons tend to be paid annually. For such longer-dated loans, interest conventionally is paid in ounces of metal, unless otherwise agreed by the parties.

The calculation formula for such a transaction therefore is:

$$\mathbf{B} \times \frac{\mathbf{R}}{\mathbf{100}} \times \frac{\mathbf{d}}{\mathbf{360}} = \text{interest due in ounces of precious metal .}$$

Lending Credit Risk

Loans, unless collateralised, fully expose the lender to the borrower's ability to repay the metal plus interest due at maturity.

Precious Metals Forwards

Swaps or Forward Swaps

In the conventions of the precious metals markets, the word "swap", unless otherwise qualified, refers to a buy metal spot/sell metal forward transaction from the borrower's perspective. From the lender's perspective, it is a sell metal spot/buy metal forward deal. Thus metal is lent or borrowed against currency, which some participants refer to as lending on the swap or borrowing on the swap to differentiate from loans and deposits. Swaps may be transacted with both legs of the deal for value dates beyond spot.

Such transactions are termed forward/forward swaps. Somewhat confusingly, some non-traditional market participants use the word “swap” to refer to a cash-settled outright forward transaction. Such transactions, which were more commonly used in the mid-1990s, can also be referred to as “Commodity-” or “Financially-settled swaps”.

Cash-settled swaps are outright forward transactions conducted with the intention that the deal will not be settled by delivery of metal and settlement of currency countervalue, but by the payment of the difference between the countervalue of the contract and the value of the contract at maturity. In other words the difference in value is “cash-settled”.

Outright Forward

This term refers to a simple purchase or sale of metal for settlement on a value date further into the future than spot.

The way in which a dealer covers an outright forward deal in an OTC market provides a useful illustration of how the forward market works.

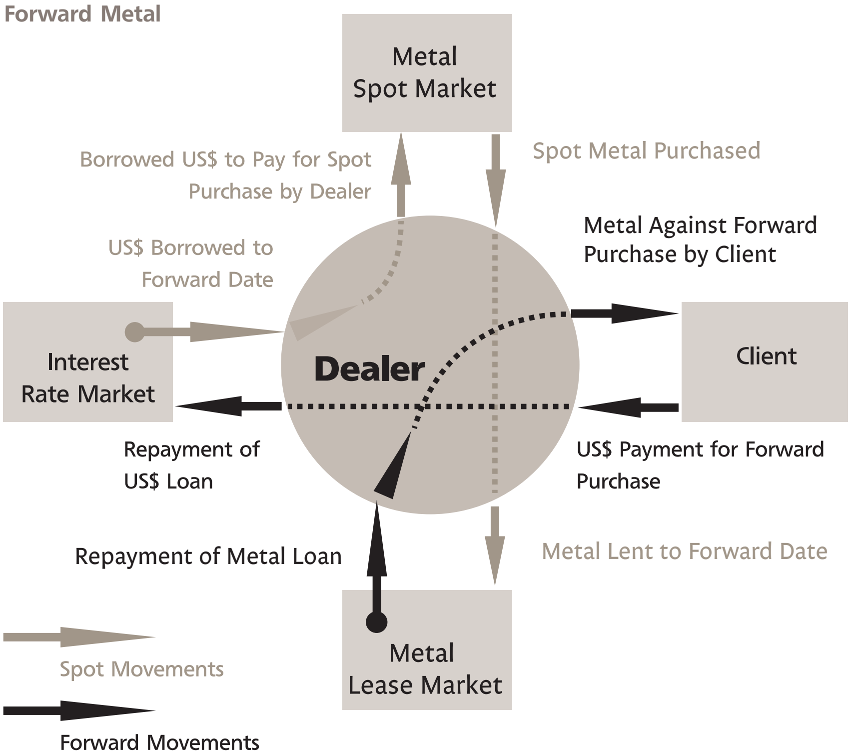
When dealing forward with a counterpart, dealers generally cover the spot exposure first and then adjust the trade to the required forward date. In the case of the counterpart wishing to make a forward purchase, the dealer will purchase spot metal in the market, generally financing the purchase by borrowing US dollars. The forward sale to the counterpart is then made on the basis of the cost of financing the transaction, less any benefit accruing to the dealer as a result of the metal liquidity created for the period as a result of the spot purchase.

The net effect is that the dealer will have purchased metal in the market on a spot basis and sold metal to his counterpart for the forward date. In other words, the dealer will have created metal liquidity for the period on his book; in market parlance, he will have ‘borrowed’ it.

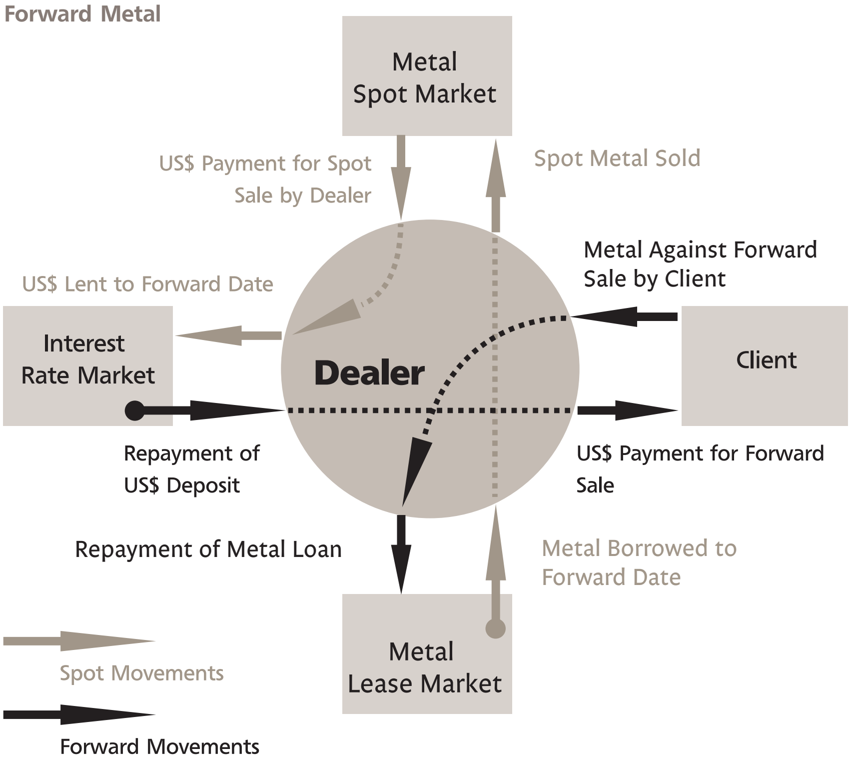
While a forward sale creates metal liquidity on the dealer’s book for the period, a forward purchase by a dealer will drain liquidity from his metal book (and create liquidity in his US$ book) until the maturity date.

The following diagrams illustrate the movements of currency and metal when a client makes a forward purchase or a forward sale of metal.

Client Buys Forward Metal



Client Sells Forward Metal



Additional Dealing Facilities

Calculating Forward Premiums

Market convention is for forward prices in precious metals to be quoted in interest rate terms on the basis of which a dealer will borrow or lend metal on the swap against currency. It is also market convention to calculate the forward premium or discount to spot on the basis of the actual days involved/360 – even if the period is for longer than one year. Calculation examples follow, which are based on 2007 averages.

For example, a dealer might quote three months forward gold at 5.00 to 5.15 This means that he will lend on the swap – sell spot and buy forward – and pay on the basis of 5.00 per cent per annum over the spot price for the forward leg, or borrow on the swap – buy spot and sell forward – and charge on the basis of 5.15 per cent per annum over the spot for the forward.

In this scenario, were the dealer to be asked to **lend on the swap** at 5.00% and the spot price were \$695.50 to \$696.00, the dealer would, in accordance with market practice, base the deal at the middle of the spread. He would therefore sell the spot at \$695.75 and buy the forward at a premium calculated as:

$$\mathbf{\$695.75 \times \frac{90}{360} \times \frac{5.00}{100} = \$8.70}$$

The forward price for three months therefore equals:

$$\mathbf{\$695.75 + \$8.70 = \$704.45}$$

The three-month quote of 5.00 to 5.15 would also be applied were a client to ask for a two-way **outright price** for the three-month forward date. The dealer would buy the forward on the basis of 5.00 % pa over his spot bid and sell the forward on the basis of 5.15 % pa over his spot offer. Using the calculation above, this would produce an outright forward dealing spread of \$704.19 to \$704.96 per ounce.

The Basis of Swap Rates

These are derived from the cost to the dealer of providing the basic transaction as illustrated in the diagrams above. Where for example the client is a buyer of the forward, it is the cost to the dealer of borrowing currency to the forward date to finance a spot metal purchase, less an interest rate to reflect the rate at which the metal can be lent out until maturity of the forward. The major determinant in the calculation of this rate is the availability, or 'liquidity', of gold, silver, platinum or palladium to fund metal in the case of forward sales.

Forward rate = Dollar interest rate – metal lease rate.

Traditionally gold interest rates are lower than dollar interest rates. This gives a positive figure for the forward rate, meaning that forward rates are at a **premium** to spot. This condition is often referred to as **contango**. On very rare occasions when there is a shortage of metal liquidity for leasing, the cost of borrowing metal may exceed the cost of borrowing dollars. In this scenario, the forward differential becomes a negative figure, producing a forward price lower than, or at a **discount** to, the spot price. This condition is known as **backwardation**.

Whether a forward is at a premium or a discount is reflected in the way in which the price is quoted. If the lower figure is first, e.g. 5.00 – 5.15, the forward is a premium. If the higher figure is first, e.g. 5.00 – 5.15, it is at a discount.

The Inter-Relationship between Forward and Lease Rates

The demand and supply for leased metal set against the demand and supply for forwards act as counter-balancing forces in determining forward swap and lease rates. Plentiful availability of metal for leasing usually implies low lease rates and hence high forward premiums. Conversely, scarcity of metal liquidity in leasing leads to high lease rates and low or even, in extreme cases, negative forward rates.

For example, a sudden increase in the supply of gold liquidity to the market will push lease rates down, which in turn will force forward rates up. Similarly, heavy forward selling activity or a decrease in the supply of liquidity will push down forward swap rates and lead to upward pressure on lease rates.

Short Date Forwards

In order to facilitate short-term adjustments to dealers' forward books or to clients' positions, swap rates are available in the market for short periods close to the spot value date. These "short-dated" swaps are generally available for the following periods:

"Tom-next"	From the next business day to the spot date.
"Spot next"	From spot to the next business day.
"Spot a week"	For one week from the spot value date.

It is important to appreciate that there is no lender of last resort in the precious metals markets. Dealers offering clearing services will therefore usually finalise their short-term metal liquidity position one day in advance. As a result of this, customers should never depend on being able to borrow metal on a today/tomorrow basis.

Forward Value Dates

Value dates for standard forward quotations are at calendar monthly intervals from spot. This means that if on 15 August, 17 August is the spot date, then the one-month date will be 17 September. Should that day be a **non-business day**, the value will be for the next good business day except at month ends, when the value date will be kept in the month, which reflects the number of months being quoted for. For example, if one calendar month forward is 30 September and that falls on a Sunday, the one-month value date will be brought back to Friday 28 September.

While quotes for standard dates out to one year are always available, dealers will generally quote for any value date upon request to facilitate clients' needs. Rates are available as far out as 15 years or even beyond, subject to credit factors.

Forward Credit Risk

Credit exposure between parties will arise on outstanding forward contracts under both outright or swap transactions while the positions remain open. It will result from fluctuations in both the spot price as well as forward swap rates. The exposure is assessed on the basis of the difference between the contract price of the transaction and the current market forward valuation for a particular value date. Such assessment of credit exposure is commonly termed “marking the position to market”, which gives rise to the expression **mark to market**.

GOFO

This is the Gold Forward Offered Rate, which is provided on Reuters page GOFO for the periods of 1,2,3,6 and 12 months. The numbers represent rates at which the Market Making Members will lend gold on swap against US dollars.

GOFO Mean

The GOFO mean provides an international benchmark for gold swap rates. It is the gold equivalent of LIBOR, the London Interbank Offered Rate for currencies and is calculated each business day at 11.00 am and published immediately thereafter. In order for the mean to be valid, rates from at least six Market Makers must be available on the GOFO page at 11.00 a.m. The mean is then determined by discarding the highest and lowest quotations and calculating the average of the remaining rates. The GOFO mean provides the benchmark for long-term finance and loan agreements as well as for the settlement of gold Interest Rate Swaps and Forward Rate Agreements (see page 26).

LGLR

Indicative mid-market London Gold Lease Rates based on GOFO means are published on Reuters page LGLR. Generally speaking, gold swaps are quoted in the market with a bid/offer spread of approximately 20 basis points. Furthermore, when a gold lease is calculated, the spread on the currency deposit component must also be taken into account; this has been taken as 12.5 basis points. The sum of the two midpoints – 16.25 basis points – is rounded to 16. Therefore, the gold lease mid-rates are calculated by the following formula:

US$LIBOR – (GOFO + 16 bp) = Gold lease mid-rate

SIFO

This is the Silver Forward Mid Rate and provides indicative forward rates for silver based on the midmarket rates (the midpoint between the bid and offer sides of the swap). As these are only indicative rates, the LBMA does not recommend that they be used as benchmarks to settle any transactions.

Options in the Precious Metals Markets

Many LBMA and LPPM Members offer quotations in OTC options in precious metals. While the market provides quotations for standard, month-end maturities for convenience, in the OTC environment dealers may provide prices for other maturities subject to negotiation. Additionally, many tailored structures are available to clients seeking protection against possible future price fluctuations. Further, in some cases, clients are happy to receive premium income from selling options that present an acceptable risk scenario.

Option Basics

A precious metal option represents the purchase or sale of the right to buy or sell precious metal, rather than an outright purchase or sale. The precious metal that is the subject of the option is referred to as the **underlying asset**.

An option therefore is the right but not the obligation to buy from, or to sell to, the seller (or grantor) of the option, an agreed quantity of the underlying asset at an agreed price (the **strike price**) up to or on an agreed date in the future (the **expiration date**). The buyer of the option may **exercise** his rights under the option up to that date. In the case where the seller of the option sells, or grants, the buyer of the option the right to buy the underlying asset, the option is termed a **call option**. If the seller of the option grants the buyer of the option the right to sell to him the underlying asset, it is termed a **put option**.

One important aspect to note is that the market risk for the buyer of an option is finite and limited to the premium paid, whereas for the seller, it is theoretically infinite.

The price of the option, or the amount that the seller is willing to accept and the buyer to pay is the **premium**. The premium is based on various option pricing formulae that rely upon six elements:

- Current spot market price of the precious metal
- Strike price required
- Number of days during which the seller of the option is at risk of the option being exercised
- Interest cost to fund any precious metal position that the seller of the option will need to take in order to hedge the risk on the option he has sold
- Interest rate of the underlying currency involved in the transaction to the maturity date of the option
- Volatility

Of these, **volatility** is the variable factor of the equation and is the paramount element in determining the real price for options based upon demand and supply for them. In the first instance, it reflects the price movement of the underlying asset over a set number of immediate past days; this is **historic volatility**. This is tempered by the probability that the option will be exercised, that the price of the underlying asset at the time of expiration will create a profit for the buyer of the option or that the option will be **in-the-money**. This probability is reflected in the level for volatility applied by each dealer when making prices and will vary from dealer to dealer according to their view of the market as well as their own option book. This is **implied volatility**, which to many reflects the real price of options.

Options fall into several categories:

- **European Options** may be exercised only on the expiration date. This option style is the one most commonly used in the London precious metals markets.

- **American Options** may be exercised on any day up to and including the expiration date.

- **Asian (or Average Price) Options** are options for which the outcome is reliant not only on whether or not the option is in-the-money at expiry, but also depends on the average price of the underlying throughout the option life.

- **Barrier Options** are options whose outcome depends on the performance of the underlying during the life of the option and whether that price breaches some predetermined barrier level.
- **Window Options** are those whose outcome depends on the performance of the underlying during the life of the option and whether that price lies between certain parameters on a certain observation day or days.

As derivatives research continues and ever-more inventive minds turn to the options market, this cannot be an exhaustive list.

Option Conventions

For clients, an **option quotation** will usually be made in terms of the dealer's premium bid and offer. For gold, the premium is generally quoted in US dollars per fine ounce, for silver, in US cents per ounce and for platinum and palladium, US dollars per ounce. Given the importance of volatility in option pricing however, among dealers, options may be quoted and traded in terms of the volatility.

Settlement of premium is generally required two business days after the trade date upon which the option transaction is effected

Standard expiration dates are for two business days prior to each month-end date with any resulting outright transaction being settled on that month-end date.

Expiration time is at 9.30 am New York time on the expiration date.

Settlement of an option that has been exercised is generally effected by a spot loco London unallocated bullion transaction or spot loco London / Zurich unallocated platinum or palladium transaction. However, options may be 'cash settled' if mutually agreed by the parties involved.

If an option is **cash settled** upon exercise, the party that had originally sold the option pays the option holder on the basis of the difference between the strike price and the market price at expiration multiplied by the notional amount of the transaction.

Option Credit Risk

This is different for the seller and for the buyer of an option. For the seller, the risk is eliminated as soon as the premium has been received from the buyer (except for settlement exposure should the option ultimately be exercised). The buyer of an option however is at risk as to whether a seller will fulfil his obligations should the option be exercised. This credit risk exposure is generally determined as the replacement cost of the option until the final settlement of the transaction. For this reason, option sellers may be required to pay a margin to the buyers.

Additional Dealing Facilities

Beyond the basic facilities of spot, forward, leases and options, a number of additional facilities are available, generally relating to gold. These can be compared to tools enhancing the basic functions provided by forwards and leases. 'Deferred accounts' and 'spot deferred transactions' provide greater flexibility than basic forward transactions while interest rate derivatives, such as "Forward Rate Agreements" (FRAs) and "Interest Rate Swaps"

(IRSs), address some of the incompatibilities between the priorities of lenders and borrowers, thus increasing the efficiency of the lease market.

Deferred Accounts

The deferred account facility offers bullion clients both gearing and flexibility. As an alternative to an outright forward transaction with a set timescale and quantity, a deferred account offers the facility to trade in bullion as a spot deal but to run the position through time without settling transactions. It can be considered an open-ended, rolling forward.

The underlying premise of the facility is that settlement and delivery of transactions are deferred on a day-by-day basis – the buyer does not pay dollars and the seller does not deliver bullion. While bullion against purchases or sales is credited or debited to a client's unallocated account in gold or silver, and the cash countervalue of the transaction is debited or credited to his currency account, actual settlement and delivery are not effected.

The client is then charged interest on day-to-day balances for the account that is in debit – either metal or cash – and paid for the account that is in credit, based on an agreed formula set by the dealer. Interest is applied to the accounts at specified intervals.

Deferred Account Credit Risk

The balance of the account that is in debit is offset against the account that is in credit to determine a net exposure or risk between dealer and client. The very nature of these accounts means that they can be marked to market on a daily basis. It is normal for a client to be required to maintain a margin in excess of the net exposure.

Spot Deferred Forward Contract

Whereas the deferred account is a short-term facility, the spot deferred contract is a long-term one, in which delivery is deferred by rolling contracts forward as they mature. For this reason, the structure is sometimes referred to as a floating rate forward. Instead of settlement being deferred by charging interest on outstanding balances, delivery of metal is deferred by rolling maturing contracts forward within a long-term facility. This is done at the maturity of each transaction on the basis of the price of the maturing contract, but within a set maximum tenor or timeframe.

For example, a client may sell forward for six months within a five-year spot deferred facility. The client may choose to roll a sale forward at each maturity within the five-year period following the initial sale before finally making delivery of the bullion. Each rollover may be for a term that suits the client. The facility is a core hedging product for mine producers, the flexibility it provides being particularly suitable for hedging production.

Within the term of the spot deferred contract, sales of gold may be made with no predefined delivery date but with the facility, and in fact contractual obligation, to extend the forward pricing on the maturity of each sale until final delivery is made, or the contract reaches its termination date. This is achieved by the resetting of interest rates for both bullion and US dollars at the maturity of each sale to determine the contango for the new rollover period, which is calculated on the basis of each maturing contract price.

The spot deferred facility provides a number of benefits for mine producers. While it enables them to achieve one compounded net sale price for each delivery of bullion against actual production, it also represents a tool that provides flexibility over both pricing and delivery together with elements of interest rate management.
In pricing, it enables producers to match their production to their hedging programme by selling gold when they deem the price is right, and to deliver production against such sales as and when they choose. In other words, it gives them the flexibility to sell and deliver production into the market when the gold price is high while leaving existing hedges running, or being able to make deliveries against maturing hedge transactions when spot market prices are low.

The client benefit from an interest rate management perspective is that if the spot price is attractive when forward premiums are low, value dates set for sales can be short term. When forward premiums become more attractive, longer maturity dates may be set at rollovers.

Spot Deferred Credit Risk

This is determined as with any forward on the basis of marking the outstanding positions to market.

Historic Rate Rollover and Spot Deferred

The spot deferred contract should not be confused with the historic rate rollover. Although both entail the rolling forward of maturing forward transactions, the two are different in purpose and intent. As seen above, in the case of the spot deferred contract, the intent to roll forward is contained in the terms of the contract of agreement between the parties at the outset. However, with the historic rate rollover, this intention is not expressed at the inception of the transaction.

In its publication *The London Code of Conduct for Principals and Broking Firms in the Wholesale Markets*, the Financial Services Authority stated that:
"There is widespread recognition that, as a general rule, deals at non-market rates should not be undertaken. Banks, brokers and other listed firms are strongly discouraged from entering into or arranging deals at materially non-current rates, including rolling-over an existing contract at the original rate. These should only be undertaken, if at all, on rare occasions and then after most careful consideration by both parties and approval, on a deal-by-deal basis, by their senior management. Senior management must ensure that proper procedures are in place to identify and bring to their attention all such deals when they are proposed so that they can be made fully aware of the details before reaching a decision on whether a particular trade should go ahead on this basis."

Inventory Loans

The inventory loan is the basic financial tool of the precious metals fabricating and refining industries. For example, jewellery manufacturers can finance the raw material in their production process by leasing gold or silver, generally at interest rates much lower than those prevailing in their local currency. As repayment of the bullion loan can be made by purchasing bullion for spot at the same time that finished jewellery products are sold, price exposure between the local currency, as well as the US dollar gold price, is automatically hedged. The jeweller buys his gold or silver when he sells his finished jewellery, thereby avoiding any price risk. The same kind of strategy would, for example, be adopted in platinum and / or palladium by catalyst manufacturers or users.

Gold Forward Rate Agreements (FRA) and Interest Rate Swaps (IRS)

Gold FRAs and IRSs are tools developed to assist in gold interest rate management and are designed to provide greater flexibility than basic loan transactions. They are instruments to either hedge or speculate against future movements in gold lease rates. In themselves, they do not entail actual lending or borrowing of gold but are based on a **notional loan** and as such are off balance sheet instruments. A FRA covers a single time period in the future with a final maturity generally within one year of the trade date, whereas an IRS covers several consecutive time periods over a longer time frame. An IRS therefore may be considered to be a strip of FRAs.

FRAs and IRSs are termed “contracts for differences”. In the case of the Gold FRA, this means that an agreement is made between two parties to make or receive payment of the difference in interest on a **notional principal quantity** of gold, for an agreed future term, on the basis of the difference between a fixed and a floating rate of interest. The **fixed rate** is the rate agreed between the parties at the inception of the agreement, and the **floating rate** that which is prevailing in the market at the commencement of the agreed term of the notional loan. Thus, counterparts pay or are “compensated” (ignoring market spreads) to bring rates that actually prevail at some future date to the rate of the previously agreed FRA or IRS. In the case of a natural borrower or lender in the market, it is therefore likely that any loss suffered as a result of a FRA or an IRS will only be an opportunity loss. It is important to note that clients are not committed to place actual physical transactions with the dealer with whom they have negotiated a FRA or IRS.

The party offering to make the notional loan is the seller of the FRA or IRS, while the buyer is the notional borrower.

Gold Forward Rate Agreements

These agreements are for those who may wish to lock in a lease rate to satisfy an identified future requirement. This might be a lender who is fully lent when lease rates spike but who wants to lock in such rates for future rollovers, or a borrower who wishes to lock in low rates when existing borrowings do not mature until some time in the future but who fears a rise in rates.

As an example, a seller might offer a gold FRA for three months against nine months at a fixed rate of 1.25%; this transaction therefore covers the six-month period between three months forward and nine months forward. On the **pricing date** (two business days prior to the start of this six-month period), the floating rate is determined by deducting the six-month GOFO rate from the US dollar LIBOR for the same period. The difference between the per annum fixed rate and the per annum floating rate is then applied to the notional principal amount for the number of days in the six-month period to determine the **settlement amount**, the difference in interest payable in ounces of gold. This settlement amount is discounted to spot at the gold lease rate for the period to allow for the fact that it is being settled at the beginning of the notional loan. The gold interest may be converted into dollars on the basis of an agreed Gold Fixing on the pricing date and paid on the **effective date**, the day on which the notional loan period would start. The seller pays the settlement amount to the buyer if the floating rate is above the fixed rate and the buyer to the seller if it is below.

The net effect is that on the pricing date, the lender can lend physical gold into the market at prevailing rates from spot, while the borrower may borrow in the same way. Any difference between the fixed rate agreed at the inception of the transaction and the actual rate at which both parties then deal is compensated by the payment of the settlement amount so that, except for small bid/offer spreads, each party effectively deals on the basis of the original agreed fixed rate.

Gold Interest Rate Swaps

Gold Interest Rate Swaps are for those who may wish to lend long term in order to enjoy the higher rates of interest such periods reflect, but for whom the risk profile of long-term lending of physical gold is unacceptable. For borrowers, an IRS permits them to cap the cost of long-term funding without using up long-term credit lines.

The IRS in gold therefore facilitates the process whereby the long-term borrowing requirements of the mining industry can be met from the liquidity provided by the central banking community with its preference for short-term lending.

For example, a seller may offer a three-year IRS at a fixed rate of 2.5% with floating rates determined, and settlement amounts paid, at three monthly intervals. The three-year term of the swap runs from the **effective date** to the **termination date** and would, in this case, be divided into twelve **calculation periods**. At the beginning of each calculation period, the floating rate for that period is determined in the same way as the FRA and payment of any settlement amount paid on agreed **payment dates**.

At each period end date, the lender and borrower may go into the market and lend or borrow gold for the next three months. They thereby, in successive segments, achieve the full three-year interest rate by compensating the interest for the short term with the settlement amount paid or received against the IRS. In so doing each achieves the rate, term and degree of security that they are seeking while avoiding the bilateral credit exposures arising from long-dated physical transactions.

In the example above, should the benchmark rate (LIBOR less GOFO for the three-month period) on any pricing day be 2% per annum, the lender can then place a fixed physical deposit of the notional amount of gold at this rate, less a market spread, for the three-month period. The loss against the agreed fixed rate would be approximately 0.5% per annum, but the buyer of the IRS will compensate the seller by this amount for this specific period. Conversely, should the benchmark rate settle at 3% per annum on any pricing date, then the buyer, who is obliged to borrow physical gold for the interim period at approximately this rate, is compensated by the seller for his 0.5% per annum loss.

FRA & IRS Credit Risk

An important advantage of both the FRA and IRS is that they involve no exchange of notional amounts. They are off balance sheet and utilise credit only to the extent of potential settlement amounts that arise as a result of interest rate differences.

Settlement calculations for both FRAs and IRSs are similar.

Settlement Amount (S) in dollars equals:

$$\mathbf{N \quad x \quad \frac{(F\text{-}R)}{100} \quad x \quad \frac{d}{360} \quad x \quad P}$$

Where:
- **N** = Notional principal quantity of bullion
- **F** = Fixed lease rate or FRA price
- **R** = Floating lease rate (US dollar LIBOR – GOFO)
- **d** = Number of days in calculation period
- **P** = Gold basis price to be applied under the agreement

In the case of a FRA, the settlement amount is generally discounted at the floating lease rate to determine the discounted amount payable (D) on the effective or payment date as:

$$\mathbf{D = S \;\; x \;\; (1 \,/\, (1 + ((R/100) \;\; x \;\; (d/360))))}$$

In the case of an IRS, payment of the interest differential is generally settled at the end of each interim period.

Exchange for Physical (EFPs)

An EFP is a facility allowed by futures exchanges that enables clients to swap their futures positions to a physical market such as London or vice versa while avoiding outright price exposure. Normal transactions on a futures exchange are conducted by open outcry on the floor of the exchange – thereby leading to uncertainty as to the realised price of the futures contract. They are then registered with the exchange. With an EFP, the price of the exchange contract is determined by the differential to the spot physical leg, and this exchange facility allows the contract to be registered without the trade passing over the floor.

There are two types of EFP transactions, the swap and the outright.

The **EFP swap** is purely a buy futures and sell loco London transaction, or vice-versa, where the futures position is exchanged for a spot physical. The price reflects the difference between the spot and futures value dates as well as the different locality and contract terms of the futures contract.

The EFP swap is quoted as spot-to-futures swap in terms of the differential in dollars. For example, in April, a September EFP swap may be quoted $1.45 – $1.65 per ounce. This means the dealer will sell spot loco London and buy the futures at a premium of $1.45 per ounce or sell the futures at a premium of $1.65 per ounce.

An **EFP outright** is a mechanism through which a client may trade out of or into a futures position when the exchange is closed via a physical transaction. It is a two-step process. First, there is an outright spot physical transaction. Second, an EFP swap is done using the same spot price basis as the first transaction, thereby unwinding the loco London exposure. The client is therefore left with an outright futures contract.

It is important when conducting off-exchange transactions in this way that they are transacted and documented in accordance with the rules and regulations of the particular futures exchange.

Other Facilities

While this Guide has covered the basics, it cannot cover all of the products available, for new ones are constantly evolving. However, many of the more sophisticated products are extensions or variations of those covered here.

Support Facilities

The London precious metals markets are supported by a number of essential facilities.

In bullion, these include:

Vaulting

Certain members of the London bullion market offer clearing services. They either use their own vaults for the storage of physical bullion or have the dedicated use of storage facilities with another party. Additionally, for gold, account facilities for allocated metal at the Bank of England are used.

Costs for storage and insurance of bullion are subject to negotiation.

Clearing

London Bullion Clearing is at the heart of the loco London system, supporting the most widely traded market for bullion dealing globally. It is a daily clearing system of paper transfers whereby LBMA Members offering clearing services utilise the unallocated gold and silver accounts they maintain between each other, not only for the settlement of mutual trades, but for third party transfers. These transfers are conducted on behalf of clients and other members of the London bullion market in settlement of their own loco London bullion activities. This system avoids the security risks and costs involved in the physical movement of bullion.

The bullion clearing system in the London market is overseen and managed by the London Precious Metals Clearing Limited (LPMCL), which is jointly owned and managed by those LBMA members which not only provide a comprehensive clearing service in the London market, but which also have applied for and been granted membership of LPMCL. LPMCL has in place rules that set out the framework under which its members operate the clearing system, covering two main areas:

- the right any LPMCL member has over any other LPMCL member to call on his unallocated account with any other LPMCL member and;
- the timing under which instructions for transfers and allocations may be given and effected.

Calls made on unallocated accounts will be either for the purpose of:

- physical delivery;
- to call for all or part of a credit balance to be transferred to a signatory where the caller has a debit balance or;
- for allocation of bullion.

Calls may be for physical, credit or balance sheet purposes. The credit purpose ensures that bullion account balances between dealers as a result of clearing activities do not breach credit limits at the end of each day.

Transfer instructions for members' own purposes and for client transfers may be made up to 4.00 p.m. London time on the day of settlement. LPMCL members then have until 4.30 p.m. to effect transfers or call for allocation for credit purposes.

The rules put in place by LPMCL enhance the financial security of the clearing by enabling "netting" of clearing activities to be set-off with all other obligations between any two LPMCL members. The netting facilities encapsulate both gold and silver.

Standard Documentation

Given the variety of products provided by members of the market and in order to avoid the problems and costs inherent in a multiplicity of bilateral agreements to cover the transactions involved, the LBMA has developed and introduced a number of standard agreements. These cover the terms and conditions for operating allocated and unallocated accounts as well as forward, option and gold interest rate derivative transactions in the OTC market.

The major advantage of standard documentation is that it defines market practise. Its utilisation by members of the LBMA avoids the need to continually check the terms involved in bilateral agreements and its broad acceptance also provides comfort to clients of the market. By its nature it sets standards for the terms under which transactions are conducted and so provides confidence to users of market products.

The following standard documentation is currently available:

Allocated and Unallocated Account Agreements
These set out the procedures for opening and conducting bullion accounts and the terms and conditions under which they are operated and maintained. However, the LBMA Unallocated and Allocated Accounts Agreements have now been superseded by new market standard documents produced by LPMCL. These can be viewed on its website, www.lpmcl.com.

The 1994 International Bullion Master Agreement (IBMA)
This is an agreement which gives a common set of terms reflecting best market practice for spot and forward bullion transactions and options, providing for the closing out and netting of outstanding bullion transactions between the parties in the event of default by one of them. As such, it is a single-product netting agreement.

It is in a form that may be executed between the parties or, if not executed and one party is acting through an office in the UK, will be presumed to apply if no other bilateral documentation has been signed between the parties.

The 1997 ISDA Bullion Definitions
The LBMA co-operated with the International Swaps and Derivatives Association to produce these Definitions that are designed to incorporate bullion transactions within the netting provisions of business conducted under an ISDA Master Agreement. They enable bullion transactions to be incorporated into the cross-product netting of the broad range of products traded between international institutions.

Where parties are signatories to ISDA, the terms of the 1997 Bullion Definitions may be applied by being incorporated into the confirmations of each transaction.

Standard Forms of Confirmation for IRS and FRA Transactions

These were also developed in conjunction with ISDA and represent stand-alone agreements or confirmations that bring these derivative products under the provisions of the 1992 ISDA Master Agreement.

Some Full Members of the LPPM provide a comprehensive range of vaulting and clearing services to facilitate loco London and Zurich platinum and palladium trading. The system operates in a similar manner to that of the London bullion market.

Taxation

From 1 January 2000, investment gold became exempt for VAT purposes in the United Kingdom in line with the EC Council Directive 98/80 EC – Special scheme for investment gold. However, under the revised VAT legislation, LBMA members will continue to zero rate supplies of investment gold between themselves and enjoy the benefit of reduced documentation requirements. Supplies of investment gold between LBMA members and UK VAT registered entities will be covered by the Special Accounting Scheme for Gold.

Within the UK, silver and non-investment gold and gold options continue to fall under the scope of the Terminal Markets Order and an agreement reached between the Commissioners of HM Customs & Excise and the LBMA. The resulting trading arrangements are often referred to as the "Black Box". In brief, sales between a Member and a non-member are zero-rated provided the Member retains effective physical control of the metal or the Member ships it outside the UK on behalf of the non-member.

For more details on tax arrangements, the LBMA recommends talking to a tax advisor.

For VAT purposes platinum and palladium currently continue to fall under the scope of the Terminal Market Order and also a separate agreement reached between the Commissioners of HM Customs and Excise (now HM Revenue & Customs) and the LPPM which facilitates the same VAT treatment as for non-investment gold and silver.

Other platinum group metals (rhodium, ruthenium, iridium and osmium) do not fall within the scope of the Terminal Markets Order and are subject to a separate VAT regime.

ACCELERATED SUPPLY Gold sold to the market before it is physically produced – generally created by producer hedging or finance transactions.

ALIQUOT A small representative sample taken from a precious metals bar for assay to determine its fine gold content.

ALLOCATED ACCOUNTS These accounts are opened when a customer requires metal to be segregated and needs a detailed list of weights and assays.

ALLOY A mixture of two or more chemical elements, including at least one metal. In the case of gold, it is mixed with a baser metal or metals to lower the purity, influence the colour or add durability.

AMERICAN-STYLE OPTION An option which can be exercised at any stage during its life, at or before expiration date.

ARBITRAGE Simultaneous buying and selling of the same asset in different markets in order to capitalise on variations in price between those markets.

ASIAN-STYLE OPTION An option which, if it expires in-the-money, is automatically settled on the basis of the difference between the strike price and the average price of the underlying asset in a given period prior to expiration.

ASK The price a dealer or seller asks for a commodity.

ASSAY The determination of the precious metal content of an alloy, either using a direct method (where the actual precious metal content is measured) or an indirect, instrumental method (usually based on spectrographic analysis) in which the levels of impurities are measured and the precious metal content is calculated by difference. For gold, the main direct method is fire assay, also known as cupellation or gravimetric analysis.

ASSAYER A tester of precious metals.

ASSAY MARK The stamp by an assayer on a bar or piece of precious metal to guarantee its fineness.

ASSAY OFFICE An official or statutory organisation controlling the testing of precious metals within a country.

AT THE MONEY Refers to an option strike price that is equal to the current market price of the underlying asset.

AUSTRALIAN SECURITIES EXCHANGE The ASX was formed in 2006 following the merger of the Sydney Futures Exchange with the Australian Stock Exchange. Website: www.asx.com.au

AVERAGE STRIKE OPTIONS Asian-style options where the ultimate settlement depends on an average strike price rather than an average underlying asset price.

AVERAGING A method whereby a smoothing of the fluctuations in price movements may be achieved by agreeing to buy or sell a specified total quantity of precious metal on the basis of the average price of the fixings over an agreed period of time.

BACKWARDATION A market situation where prices for future delivery are lower than the spot price, caused by shortage or tightness of supply.

BANK OF ENGLAND Founded in 1694. 'The Old Lady of Threadneedle Street' has been the focal point of gold and silver trading in London for over three centuries. It is one of the most active central banks in gold and is the gold depository for many of the world's central banks. Website: www.bankofengland.co.uk

BAR CHART A type of chart commonly used in technical analysis that shows highs, lows and closing prices.

BARRIER OPTIONS Exotic options that either come to life (are knocked-in) or are extinguished (knocked-out) under conditions stipulated in the options contract. The conditions are usually defined in terms of a price level (barrier, knock-out or knock-in price) that may be reached at any time during the lifetime of the option. There are four major types of barrier options: up-and-out, up-and-in, down-and-out and down-and-in. The extinguishing or activating features of these options mean they are usually cheaper than ordinary options, making them attractive to purchasers looking to avoid high premium.

BEAR Someone who expects prices to fall.

BEAR CALL SPREAD The purchase and sale of call options at different exercise prices but with the same expiry date. The purchased (or long) calls have a higher exercise price than the written (or short) calls. The investor expects a fall in the price of the underlying asset.

BEAR MARKET A market in which the trend is for prices to decline.

BEAR PUT SPREAD The purchase and sale of put options at different exercise prices but with the same expiry date. The puts purchased have a higher exercise price than the puts written. The investor expects a fall in the price of the underlying asset.

BERMUDA-STYLE OPTION Exotic options that combine certain features of American- and European-style options. They may be exercised on predetermined dates during the lifetime of the option or on the expiry date. (See also **American-Style Option** and **European-Style Option**).

BETA The beta of a rate or price is the extent to which that rate or price follows movements in the overall market. If the beta is greater than one, it is more volatile than the market; if the beta is less than one, it is less volatile.

BID The price at which a dealer is willing to buy.

BIS Bank for International Settlements. Based in Basel, Switzerland, it was founded in 1930 and now acts as a non-political central bank for central banks. Website: www.bis.org.

BLACK-SCHOLES MODEL An option-pricing model initially derived by Fischer Black and Myron Scholes in 1973 for securities options and later refined by Black in 1976 for options on futures.

BLANK A blank disc of metal with milled edges used to make a coin.

BRAZILIAN MERCANTILE AND FUTURES EXCHANGE The BM&F was incorporated in July 1985. Website: www.bmf.com.br

BRITANNIA British gold coin first issued in 1987 with a fineness of 916.6.

BREAKOUT/BREAKAWAY GAP In technical analysis, this occurs when prices break out of their trading range, leaving a gap in the chart. It is associated with an increase in volume and is regarded as a strong trend signal.

BROKER An intermediary between traders for physical, futures and over-the-counter deals. Brokers receive a fixed commission predetermined between the broker and his/her client.

BUDAPEST STOCK EXCHANGE The Budapest Stock Exchange had its origins in the Hungarian Stock Exchange, which was formed in 1864. Following World War II, the Exchange was dissolved by the government and was re-established on 21 June 1990. Commodity trading was introduced on 2 November 2005. Website: www.bse.hu

BULL Someone who expects prices to rise.

BULL CALL SPREAD The purchase and sale of call options at different exercise prices but with the same expiry date. The purchased (or long) calls have a lower price than the written (or short) calls. The investor expects a rise in the price of the underlying asset.

BULL MARKET A market in which the trend is for prices to increase.

BULLION The generic word for gold and silver in bar or ingot form. Originally meant ‘mint’ or ‘melting place’ from the old French word bouillon, which means boiling.

BULLION COINS Contemporary precious metal coins minted by official agencies in unlimited numbers for investment purposes.

BULL PUT SPREAD The purchase and sale of put options at different exercise prices but with the same expiry date. The puts purchased have a lower exercise price than the puts written. The investor expects the price of the underlying asset to rise.

BUTTERFLY SPREAD The simultaneous purchase of an out-of-the-money **strangle** and sale of an at-the-money-**straddle**. The buyer profits if the underlying remains stable and has limited risk in the event of a large move in either direction.

BUY SIGNAL In technical analysis, a chart pattern which indicates a key reversal upwards in price and the time to buy.

CALENDAR SPREAD The simultaneous purchase and sale (or vice versa) of an option of the same strike for different months.

CALL OPTION An option which gives the purchaser the right, but not the obligation, to buy an asset at a pre-determined price on or by a set date.

CAP An options contract whereby the seller agrees to pay to the purchaser, in return for a premium, the difference between a reference rate and an agreed strike price when the reference exceeds the strike on or before a specific date.

CARAT Derived from the word for "carob" in various languages, it was originally equivalent to the weight of the seed of the carob tree. It has two meanings in modern usage:

1) A measure of the weight of precious stones. 1 carat = 0.2053 gm.
2) A measure of the proportion of gold in a gold alloy, on the basis that 24 carat is pure gold, often expressed as K or k, e.g. 18k is 75% gold.

CASH & CARRY The purchase (or sale) of an underlying spot asset and the simultaneous sale (or purchase) of a futures or forward contract.

CFTC Commodity Futures Trading Commission. The United States government's regulatory agency for all US future markets. Website: www.cftc.gov

CHARTIST An analyst who forecasts future price trends by the technical interpretation of chart patterns based on historical prices.

CHERVONETZ A Russian bullion coin, 900 fine with fine gold content of 0.2489 troy ounces and a face value of 10 roubles. Issued in the 1970s.

CHINESE GOLD AND SILVER EXCHANGE SOCIETY Hong Kong's exchange first opened in 1910 and became the Chinese Gold and Silver Exchange Society in 1918. Website: www.cgse.com.hk

CHINESE WALL A barrier to the flow of information between two different parts of a firm's business.

CHOP Assay mark of Chinese origin. The term is now widely applied to a manufacturer's mark on bullion bars

CIF Cost, insurance and freight. A CIF price includes the cost of material together with transport and insurance costs to the final specified destination.

CME GROUP The CME Group was formed by the 2007 merger of the Chicago Mercantile Exchange (CME) and the Chicago Board of Trade (CBOT). Website: www.cmegroup.com.

COIN GOLD A gold alloy, usually with a minimum fine gold content of 900, prepared for making coins, usually with silver or copper, to improve durability.

COLLAR A supply contract between a buyer and a seller of a commodity, whereby the buyer is assured that he will not have to pay more than some maximum price, and whereby the seller is assured of receiving some minimum price.

COMEX The Commodity Exchange in New York, a division of **NYMEX**.

COMPOUND OPTIONS These are options on options. The underlying asset is an option rather than a tangible commodity or security.

CONSIGNMENT STOCKS These are gold or silver bars which are placed by an organisation with a client against a guarantee of payment at the prevailing price as the metal is taken out of the stock.

CONTANGO The market situation where the price for future (forward) delivery is greater than the spot price.

COST OF CARRY The cost of holding a physical commodity over a period of time. The main elements are funding costs, storage and insurance.

COVERED OPTION A covered call option is one where the writer owns the underlying asset on which the option is written. A covered put option is one where the writer sells the option while holding cash.

DAY ORDER An order to buy or sell at a particular price level which is only valid for one business day.

DEFERRED SETTLEMENT An arrangement whereby settlement of both sides of a bullion deal, metal and money, are deferred on a day-to-day basis.

DELIVERY The actual transfer of the ownership of precious metal. It may not involve physical movement of metal and is usually made by a simple paper transfer within the relevant clearing system.

DELIVERY DATE The specified day on which precious metal must be delivered to fulfil a contract.

DELTA Option risk parameter that measures the sensitivity of an option price to changes in the price of its underlying instrument.

DELTA HEDGING A strategy undertaken by granters of options to protect their exposure. A delta hedge calculation takes into account changes in the spot price, the time to expiry and the difference between the strike and spot prices.

DERIVATIVE A financial instrument derived from a cash market commodity, futures contract, or other financial instrument. Derivatives can be traded on regulated exchange markets or over-the-counter. For example, metal futures contracts are derivatives of physical commodities; options on futures are derivatives of futures contracts.

DORÉ An unrefined alloy of gold with variable quantities of silver and smaller quantities of base metals, which is produced at a mine before passing on to a refinery for upgrading to London **Good Delivery** standard.

DOUBLE BOTTOM/DOUBLE TOP In technical analysis, a double bottom occurs when the price falls to the same level twice and fails to penetrate. This signals good support. A double top is the opposite, i.e., when a price rises to the same level twice and fails to break above it, and therefore produces a level of good resistance.

DOUBLE EAGLE Gold coin with a face value of US$20 issued as legal tender in the United States during the period 1850-1932. It is 900 fine with a fine gold content of 0.9675 troy ounces.

DOW THEORY Developed by Charles Dow and referred to as the six tenets of Dow Theory, it addresses market psychology, price action and marks the foundations of technical analysis. The six tenets are: 1. The averages discount everything; 2. There are three trends; 3. Major trends have three phases; 4. The averages must confirm each other; 5. Volume must confirm the trend; 6. A trend is assumed to be in effect until it gives definitive signals that it has reversed.

DUBAI GOLD AND COMMODITIES EXCHANGE The DGCX commenced trading in 2005. Website: www.dgcx.ae

EAGLE The earliest legal tender US gold coin first minted in 1795. It is 900 fine.

EFP Exchange for Physical. Actual exchange between an OTC contract and a futures contract which takes place off exchange between parties.

ELLIOTT WAVE THEORY Developed by R.N. Elliott, the approach defines markets as moving in a predetermined number of waves. Markets move in a sequence of five waves in the direction of the underlying trend and correct in a sequence of three waves. The trend movement or impulse is labelled 1-2-3-4-5 and a correction is labelled A-B-C.

ETF/ETC Exchange Traded Commodities (or Exchange Traded Funds) are open-ended, listed securities which are arbitrageable with the underlying markets. ETCs trade on stock exchanges and have multiple market makers. ETCs are either backed by the physical commodity where possible (eg, gold, silver, platinum, palladium) or are priced off commodity futures markets, thereby providing retail and institutional equity investors with the opportunity to gain exposure to major commodities through existing equity accounts.

EUROPEAN-STYLE OPTION An option that can only be exercised on the expiry date.

EXCHANGE TRADED OPTIONS Options on future contracts offered by a recognised futures exchange.

EXERCISE The exercise by an option holder of his right to buy (call) or sell (put) an asset at the agreed strike price.

EXOTIC OPTIONS The generic term for the more sophisticated option strategies which have features over and above basic option contracts.

EXPIRY DATE The last date on which an option can be exercised.

FAS 133 (See **Financial Accounting Standards Board Statement 133**).

FCM Futures Commission Merchant. The legal term for a US commodity brokerage house handling futures exchange business.

FIBONACCI NUMBERS The Fibonacci sequence is calculated by adding any number in the series to the previous number – (1,2,3,5,8,13,21,34,55,89,...). The ratio of any number in the series to the next is 0.618 and to the number two positions away, 0.382. The mid-point between 0.382 and 0.618 is 0.50. These ratios (usually shown as percentages) are known as the Fibonacci ratios and are used in technical analysis to calculate retracement levels during a correction. The inverse of 0.618 (1.618) is used in calculating (Elliott Wave) projections. Fibonacci ratios form an integral part of **Elliott Wave Theory.**

FINANCIAL ACCOUNTING STANDARDS BOARD (FASB) Private sector organisation responsible for establishing standards of accounting and financial reporting in the US.

FINANCIAL ACCOUNTING STANDARDS BOARD STATEMENT 133 (FAS 133) FAS 133 obliges US companies to put all financial derivative instruments that are not used to hedge exposure on the balance sheet at market value. Companies therefore disclose unrealised gains and losses on derivatives, rather than accounting for them only at maturity.

FINENESS The proportion of precious metal in an alloy expressed as parts in 1,000.

FINE WEIGHT The weight of gold contained in a bar, coin or bullion as determined by multiplying the gross weight by the fineness.

FIRE ASSAY A method of determining the content of a metal (most commonly gold) in an alloy involving the removal of other metals by what is in effect a combination of fire-refining (for the removal of base metals) and chemical refining (for the removal of silver) and then determining the gold content by comparing the initial and final weights of the sample. Fire assay can determine the gold content of Good Delivery-type alloys to an accuracy of better than 1 part in 10,000. Fire assay is also known as cupellation or gravimetric analysis.

FLAG In **Technical Analysis**, one of the basic chart patterns. In a bull market a flag occurs when prices consolidate for a period then continue to rise. In a bear market the converse occurs, i.e., prices resume falling after a period of consolidation.

FLAT RATE FORWARDS Forward contracts offering a constant contango throughout the life of the contract.

FLOOR A supply contract between a buyer and seller of a commodity, whereby the seller is assured that he will receive at least some minimum price. This type of contract is analogous to a put option, which gives the holder the right to sell the underlying at a predetermined price.

FOB Free on Board. A FOB price usually includes cost of transport, insurance and loading onto a vessel at the port of departure.

FOOL'S GOLD Pyrites of iron sulphide, which is gold-like in appearance and can delude amateur prospectors.

FORWARD PREMIUM The difference between spot and forward quotations which will be determined by money and precious metal interest rates and storage charges.

FORWARD TRANSACTION Purchase or sale for delivery and payment at an agreed date in the future.

FSA Financial Services Authority. The single financial services regulator in the United Kingdom. Website: www.fsa.gov.uk

FSMA The Financial Services and Markets Act 2000 – the legislation that set up the **Financial Services Authority** and defines its powers. It came into force in late 2001.

FUNDAMENTAL ANALYSIS The study of basic underlying factors which will affect the supply and demand of a traded commodity.

FUTURES CONTRACT An agreement made on an organised exchange to buy or sell a specific commodity or financial instrument on a set date in the future at a set price. In practice, most futures positions are 'squared off' before maturity with delivery, if it takes place, in the form of a warehouse receipt.

GAMMA The sensitivity of an option's delta to changes in the price of the underlying instrument.

GEARING The potential to magnify profits or losses by incurring exposure to large positions from an initially small investment outlay. Also known as leverage.

GOFO Gold Forward Offered Rate. The gold equivalent to LIBOR. The rates at which dealers will lend gold on swap against US dollars.

GOFRA Gold Forward Rate Agreement. An 'off balance sheet' instrument used to minimise forward gold interest rate exposure. It hedges the combined effect of moves in both US dollar and gold interest rates with settlement in dollars.

GOLD Latin name Aurum. Chemical symbol Au. Its specific gravity is 19.32 and melting point is 1063°C.

GOLD ACCUMULATION PLANS (GAPs) Gold investment accounts whereby the investor agrees to invest a certain sum of currency in gold each month. Gold accumulated in the account can later be sold back or withdrawn as physical metal in a variety of forms, including bars, coins or jewellery.

GOLD FIXING Held twice each working day at 10.30 am and 3.00 pm in the City of London.

GOLD LOAN The provision of finance in gold for a gold-related project or business, typically in mining or jewellery inventory finance, which provides a combination of generally inexpensive funding together with built-in hedging.

GOLD PARITY Legally fixed quantity of gold to which a monetary unit is pegged.

GOLD POOL The gold pool was an alliance between the Central Banks of Britain, Belgium, France, Italy, the Netherlands, Switzerland, the United States and West Germany from 1961 to 1968 which endeavoured to maintain the gold price at US$35 dollars per troy ounce.

GOLD/SILVER RATIO The number of ounces of silver that can be bought with one ounce of gold.

GOLD STANDARD A monetary system with a fixed price for gold, and with gold coin either forming the whole circulation of currency within a country or with notes representing and redeemable in gold.

GOLD WARRANT

1. A warrant giving the buyer the right to buy gold at a specific price on a specified value date, for which the buyer pays a premium. While similar in structure to options, warrants are securitised instruments.
2. A certificate often issued by exchanges indicating ownership of physical metal.

GOLDFRA Gold Lease Forward Rate Agreement. Similar to a GOFRA but is restricted solely to gold interest rates hedging with settlement in gold. A hedging product that is popular with those who have gold borrowing or deposit requirements. Goldfras are generally settled against the benchmark of US dollar LIBOR minus the GOFO mean on the observation date.

GOOD DELIVERY The specification which a gold or silver bar or a platinum or palladium ingot or plate must meet in order to be acceptable for delivery in a particular terminal market or futures exchange.

GRAIN One of the earliest units of weight for gold; one grain being the equivalent of one grain of wheat taken from the middle of the ear. 1 grain = 0.0648 grams or 0.002083 troy ounces. 15.43 grains = 1 gram; 480.6 grains = 1 troy ounce; 24 grains = 1 pennyweight. (See also **Granules**).

GRANULES Bullion, including its various alloys presented for sale in granulated form, often referred to as grain.

GUINEA British gold coin with a nominal value of £1 first issued in 1663 and named after gold from Guinea in West Africa. It was unofficially revalued at 21 shillings at The Great Recoinage of 1696, a value confirmed in 1717. It has a fineness of 916.6 and a fine gold content of approximately ¼ troy ounce.

HALLMARK A mark or number of marks made on gold or silver jewellery and other fabricated products to confirm that the quality is of the fineness marked on the item. See website: www.thegoldsmiths.co.uk

HEAD AND SHOULDERS A three-peak pattern resembling the head and shoulders outline of a person, which is used to chart stock and commodity price trends. The pattern indicates the reversal of a trend. As prices move down to the right shoulder, a head and shoulders top is formed, meaning that prices should be falling. A reverse head and shoulders pattern has the head formation at the bottom of the chart and means that prices should be rising.

HEDGE A transaction entered into in order to offset the impact of adverse price movements of an asset.

HISTORIC VOLATILITY Mathematically derived from price fluctuations of the underlying asset over a past specified period of time.

IBMA The International Bullion Master Agreement, issued by the LBMA in 1994.

IFEMA International Foreign Exchange Master Agreement.

IMF The International Monetary Fund was conceived at the Bretton Woods Conference in 1944 to promote international monetary co-operation and stability. It opened in Washington DC in 1947. Website: www.imf.org

IMPLIED VOLATILITY Volatility as calculated by determining the variable in the Black-Scholes option price formula from market option prices. The element of the formula that identifies the degree of supply and demand for options.

IMRO The Investment Management Regulatory Organisation (an SRO) – superseded by the Financial Services Authority in 2001.

IN THE MONEY Refers to options with intrinsic value. For example, calls where the strike price is less than the underlying asset price or puts where the strike price is greater than the underlying asset price.

INTRINSIC VALUE Refers to options. The difference between the current spot price and the option strike (or exercise) price, ie, the in-the-money element.

IRIDIUM Chemical symbol Ir. Its specific gravity is 22.50 and its melting point is 1539 °C.

ISDA The International Swaps & Derivatives Association. Website: www.isda.org

ISDA MASTER AGREEMENT The International Swaps and Derivatives Association (**ISDA**) over-the-counter derivatives master agreement was drawn up by the New York-based trade association in 1987, revised in 1992 and again updated in 2002.

ISDA BULLION DEFINITIONS
An addendum to the **ISDA Master Agreement** developed in 1997 by ISDA and the LBMA to cover bullion terms. The 2005 ISDA Commodity Definitions incorporates the 1997 ISDA Bullion Definitions with some revisions.

ISLANDS In technical analysis, an island top is formed when a market gaps up and then gaps down during an uptrend to leave an isolated trading session. An island bottom is found at the base of a downtrend. Islands are regarded as a reversal pattern.

ISTANBUL GOLD EXCHANGE The Istanbul Gold Exchange was founded in 1995. Website: www.iab.gov.tr

JAKARTA FUTURES EXCHANGE (PT. BURSA BERJANGKA JAKARTA) The JFX was established in August 1999. Website: www.bbj-jfx.com

JAPANESE CANDLESTICK THEORY The principles were developed in Japan during the 17th century by Munehisa Homma, a rice broker. Similarly to a bar chart, a candle chart uses the open, high, low and closing prices – however, in a candle chart a body is created between the opening and closing prices. The bodies are presented in different colours to highlight the session's direction – usually a white body for an up day (open above the close) and a black body for a down session (close below the open). Regarded as good short-term signals.

KAM Chinese for gold.

KEY REVERSAL In technical analysis, a crucial change in price direction, signalling an end to either a bull or bear market.

KILO BAR A popular small gold bar. A one kg bar .995 fine = 31.990 troy ounces, and a 1 kg bar 999.9 fine = 32.148 troy ounces.

KNOCK-IN In options, an exotic option in which the option becomes valid only when a predetermined price level (usually different to the strike price) is touched during the lifetime of the option.

KNOCK-OUT An exotic option which is automatically terminated or 'knocked out' if the price of the underlying asset reaches a predetermined level (usually different to the strike price) during the lifetime of the option.

KOALA Australian platinum coin with a fineness of 999.5.

KRUGERRAND South African gold coin first issued in 1967 with a fineness of 916.6.

LAKH (OR LAC) Indian term for 100,000. Frequently used to describe silver or gold orders.

LBMA The London Bullion Market Association was formally incorporated on 14 December 1987 to represent the interests of the participants in the wholesale bullion market and to encourage the development of the London market. Website: www.lbma.org.uk

LBMA GOOD DELIVERY LIST List of acceptable refiners of gold and silver whose bars meet the required standard (of fineness, weight, marks and appearance) of the London Bullion Market Association.

LEVERAGE (See '**Gearing**').

LIMIT ORDER An order that has restrictions placed on it. The customer specifies a price and the order can only be executed if the market moves to or betters that price.

LIQUIDITY The market tradability of an asset. A highly liquid market has a large number of buyers and sellers, or lenders, making it easy to enter or exit.

LOCO The place – location – at which a commodity, e.g. loco London gold or loco Zurich platinum, is physically held.

LONG A long position means the purchase and retention of an asset.

LONG STRADDLE The purchase of call and put options with the same exercise price and expiry date. The investor expects a significant increase in volatility; direction of prices is not of prime importance.

LOOKBACK OPTION A history-dependent option where the settlement at maturity is reliant not only on whether the option is in-the-money at expiry, but also on the maximum or minimum price achieved by the underlying asset during at least some part of the option life.

LOT Commonly used word for a standard futures contract.

LPPM The London Platinum and Palladium Market was formalised by a Deed of Establishment in 1987 and represents the interests of the participants in the wholesale platinum and palladium markets and encourages the development of the London and Zurich markets. Website: www.lppm.org.uk

LPPM GOOD DELIVERY LISTS Lists of acceptable refiners of platinum and palladium whose plates and ingots meet the required standard (of fineness, weight, marks and appearance) of the London Platinum and Palladium Market.

MACD (MOVING CONVERGENCE / DIVERGENCE MOMENTUM INDICATOR) Usually the difference between the 26-day and 12-day exponential moving averages, although these parameters can be altered. A positive MACD indicates the 12-day average is above the 26-day average and highlights a positive period / trend. The opposite holds true for a negative reading and a downtrend.

MAPLE LEAF Canadian gold coin with a fineness of 999.9 or platinum coin with a fineness of 999.5.

MARGIN Deposit, or collateral, required as security against open positions in futures, forwards or options markets. Also called 'Initial Margin' or 'Original Margin'.

MARGIN CALL The request for additional funds to cover losses on forward or futures contracts where the price has moved against a client. (Also see **Variation Margin**).

MARKET ORDER An order given to a dealer for immediate execution, to buy or sell at the best prevailing price. Also known as 'At Best' or 'At Market'.

MARK TO MARKET The revaluation of a position at current market price levels.

MCX Multi Commodity Exchange of India Ltd. Headquartered in Mumbai, MCX is a demutualised multi-commodity futures exchange. The exchange began operations in November 2003. Website www.mcxindia.com

MIN/MAX (MINIMUM/MAXIMUM) A zero cost collar-style hedging strategy whereby a client sells one option in exchange for another. In bullion markets, primarily used by producers who grant call options in exchange for put options – in this case, the structure guarantees that the client will receive a minimum pre-determined price in exchange for a possible opportunity loss if the actual price at maturity is above a maximum level, as determined by the strike price of the call option granted.

MOVING AVERAGE In technical analysis, this is a key trend line that is plotted on a bar chart, reflecting the progress of prices over a given period of time. (See also **Weighted Moving Average**).

NAKED OPTION The sale of an option by a party who does not hold the underlying asset to back it. (See **covered option**).

NAPOLEON French gold coin with a face value of 20 francs, bearing a portrait of Napoleon I or Napoleon III. It had a fineness of 900 and a fine gold content of 0.1867 troy ounces.

NCDEX National Commodity and Derivatives Exchange. An on-line multi-commodity exchange located in Mumbai, it began operations in December 2003. Website: www.ncdex.com

NOBLE Isle of Man platinum coin with a fineness of 999.5.

NUMISMATICS The specialised sector of the coin business for the study and collection of rare coins and other media of exchange, particularly those with archaeological and historic interest.

NYMEX A US futures exchange consisting of two divisions, NYMEX (the New York Mercantile Exchange) and COMEX (the Commodities Exchange). Website: www.nymex.com

OFFER The price at which a dealer is willing to sell.

OPEN INTEREST On a futures exchange, the daily statistic that indicates the number of open contracts, i.e., those which have not been fulfilled or closed out.

OPEN OUTCRY A style of trading conducted on a futures exchange in a ring or a pit where dealers face each other, calling out the price, contract, month and number of contracts.

OPEN POSITION A market position that has not been closed out.

OPTION An option is the right but not the obligation to buy and sell a pre-determined quantity of an underlying asset at a pre-determined price by or on a defined date.

ORE Originally from the Old English for crude or unwrought metal. It refers to any economic mineral deposit of precious or other metals.

OSMIUM Chemical symbol Os. Its specific gravity is 22.50 and its melting point is 2700 °C.

OTC Over the Counter. Transactions that are quoted and conducted between parties on a principal-to-principal basis as opposed to being traded via a broker on an exchange.

OTC OPTION Over the Counter options are not traded on recognised future exchanges but between organisations acting as principals, or between a bank and its client.

OUT OF THE MONEY Refers to options with only time value, ie, no intrinsic value, eg, calls where the strike price is greater than the underlying asset price or puts where the strike price is less than the underlying price.

OVERBOUGHT A market in which the price, under excessive buying pressure, has risen too high and too fast without genuine fundamental support to maintain the new level.

OVERSOLD A market which has fallen too far and too fast under excessive selling pressure and is expected to move back to a higher, more neutral level.

PALLADIUM Chemical symbol Pd. Its specific gravity is 12.00 and its melting point is 1555 °C.

PALLADIUM FIXING Held twice each working day at 9.45 am and 2.00 pm in the City of London.

PANDA Chinese gold coin of 999.9 quality, first made in 1982.

PANNING The classic and simple method of mining alluvial gold.

PAPER GOLD A term used to describe gold contracts such as loco London deals and futures contracts which do not necessarily involve the delivery of physical gold.

PENNYWEIGHT Originally the weight of a silver penny in Britain in the Middle Ages which is still widely used in North America as the unit of weight in the jewellery trade. 20 pennyweights = 1 troy ounce.

PHILHARMONIKER Austrian gold coin of 999.9 fineness, first issued in 1989.

PIA The Personal Investment Authority took over from LAUTRO and FIMBRA in 1994 as **SRO** for most firms conducting investment business with the private investor. It was superseded by the **FSA** in 2001 when **FSMA** came into force.

PLATINUM Chemical symbol Pt. Its specific gravity is 21.45 and melting point is 1773 °C.

PLATINUM FIXING Held twice each working day at 9.45 am and 2.00 pm in the City of London.

PLATINUM GROUP METALS Platinum, palladium, iridium, osmium, rhodium and ruthenium.

PRECIOUS METALS Generally refers to gold, silver, platinum, palladium and other platinum group metals.

PUT OPTION A contract which gives the buyer the right, but not the obligation, to sell a specified amount of an asset at a predetermined price on or before a specified date.

PUT SPREAD An options position comprised of the purchase of a put option at one level and the sale of a put option at some lower level. The premium received by selling one option reduces the cost of buying the other, but participation is limited if the underlying goes down.

QUARTATION The process in which silver is separated from gold by dissolving it out with nitric acid, more commonly referred to as nitric acid parting.

REFINING The separating and purifying of precious metals from other metals.

RESISTANCE In technical analysis, the price level where selling is expected to emerge.

RHO A measure of an option's sensitivity to a change in interest rates; this will impact on both the future price of the option and the time value of the premium. Its impact increases with the maturity of the option.

RHODIUM Chemical symbol Rh. Its specific gravity is 12.44 and its melting point is 1966 °C.

RISK The exposure to adverse market movements, mischance or the possibility of losing money.

ROLLED GOLD The process in which a layer of carat gold alloy is mechanically bonded to another metal.

RSI (RELATIVE STRENGTH INDEX) Developed by J. Welles Wilder, the RSI compares the magnitude of an instrument's gains to its losses over a set period (usually 14 days). This is a momentum oscillator and provides information such as overbought or oversold conditions and divergence between price and indicator.

RUTHENIUM Chemical symbol Ru. Its specific gravity is 12.20 and its melting point is 2500 °C.

SCRAP GOLD The broad term for any gold which is sent back to a refiner or processor for recycling.

SELL SIGNAL In technical analysis, a chart pattern which indicates a key reversal downwards in price.

SETTLEMENT DATE The date on which a contract must be fully paid for and delivered. It is the general practice in international precious metals markets for settlement to take place two business days after the transaction date, i.e., spot.

SETTLEMENT PRICE In futures markets, the price that is set by the exchange committee at the end of each trading day and which is used by the clearing house to market open positions and assess margin calls.

SETTLEMENT RISK The risk that arises when payments are not exchanged simultaneously, generally arising due to time differences. One party to a transaction must effect payment or delivery in an earlier time zone without having confirmation of the receipt of a reciprocal asset in a later time zone.

SFA The Securities and Futures Authority (an **SRO**) was responsible for the regulation of investment business in the UK. It was superseded by the **FSA** in 2001 when the **FSMA** came into force.

SHANGHAI GOLD EXCHANGE The Shanghai Gold Exchange was founded in 2002. Website www.sge.sh

SHANGHAI FUTURES EXCHANGE The Shanghai Futures Exchange was formed in December 1999. Website: www.shfe.com

SHORT A short position means the sale of an asset not yet owned.

SHORT STRADDLE The sale of a call and put option with the same exercise price and expiry date. The investor has a neutral view of the underlying asset and expects limited price fluctuation.

SILVER Latin name Argentum. The chemical symbol is Ag, specific gravity is 10.49 and the melting point is 960°C.

SILVER FIXING Held each working day at 12.00 pm in the City of London.

SINGAPORE EXCHANGE LIMITED (SGX) The Singapore Exchange was inaugurated on 1 December 1999, following the merger of the Stock Exchange of Singapore (SES) and the Singapore International Monetary Exchange (SIMEX). Website: www.sgx.com

SMELTING The process of melting ores or concentrates to separate out the metal content from impurities.

SOUK The local name for market used throughout the Arab world.

SOVEREIGN British gold coin with face value of one pound sterling, a fineness of 916.6 and a fine gold content of 0.2354 troy ounces.

SPOT SETTLEMENT Delivery of metal and payment of money, which takes place two business days after the transaction date.

SPOT DEFERRED Hybrid forward contract offering floating interest rates and no fixed delivery. It is more flexible than conventional spot or forward contracts.

SROs Self Regulatory Organisations were established under the Financial Services Act of 1986 to carry out the regulation of most institutions involved in investment activities in the UK. Under **FSMA**, the role played by the SROs was taken over by the **FSA** in 2001.

STANDARD BAR / PLATE / INGOT

1) Gold bar weighing approximately 400 ounces or 12.5 kilograms and having a minimum fineness of 995 parts per 1,000 pure gold
2) Silver bar weighing approximately 1,000 ounces with a minimum fineness of 999
3) Platinum or palladium plate or ingot between 1 and 6 kilos with a minimum fineness of 9995.

STANDARD DEVIATION Statistical measure of the degree to which an individual value in a probability distribution tends to vary from the mean of the distribution. Indicates probability of a variable or price falling within a certain width or band around the mean.

STOCHASTICS Developed by George Lane, this momentum oscillator shows the location of the current close relative to the high/low range over a specified period. Closing levels near the top of the range indicate buying pressure, while closing levels near the base of the range indicate selling pressure.

STOP LOSS An order placed to liquidate an open position when the price reaches a specified level in order to prevent further losses. These orders are only handled on a 'best efforts' basis, as there is no guarantee that an order can be executed at the specified price if the market is highly volatile and prices move so fast, or 'gap', that the order cannot be carried out at the price requested.

STRADDLE Purchase or sale of call and put options for the same underlying asset with the same expiry date and strike price.

STRANGLE In options, a speculative strategy of either buying or selling puts and calls, each with the same expiry date but with different strike prices.

STRIKE PRICE In options, the pre-determined price at which an option may be exercised.

SUPPORT In technical analysis, the price level where new buyers are expected to emerge.

SWAP

1. Simultaneous purchase and sale of spot against forward.
2. An exchange between different locations.
3. A swap or exchange of different size of quality of bullion bars.
4. An agreement whereby a floating price is exchanged for a fixed price over a specified period.

SWITCH Simultaneous purchase and sale of the same asset for different maturity dates.

TAEL Traditional Chinese unit of weight for gold. 1 tael = 1.20337 troy ounces = 37.4290 grams. The nominal fineness of a Hong Kong tael bar is 990 but in Taiwan 5 and 10 tael bars can be 999.9 fine.

TECHNICAL ANALYSIS The study of historical prices, examining patterns of price change, rates of change, and changes in volume of trading and open interest, in order to predict future price behaviour. Technical analysis is usually performed in chart or graph form.

THETA In options, the rate of change in the value of the option with respect to time with all else remaining the same.

TIME VALUE Refers to options. The difference between an option's market price and its intrinsic value.

TOLA Traditional Indian unit of weight for gold.
1 tola = 0.375 troy ounces = 11.6638 grams.
The most popular sized bar is 10 tola = 3.75 troy ounces.
Weights are for 999.9 gold purity.

TOKYO COMMODITIES EXCHANGE TOCOM was established on 1 November 1984 as a merger of the Tokyo Textile Exchange, the Tokyo Rubber Exchange and the Tokyo Gold Exchange. Website: www.tocom.or.jp

TOM/NEXT Refers to the time period commencing one business day forward from the present and ending one business day later (usually spot). In bullion, generally refers to the swap rate for borrowing or lending metal vs. US$ for this time period, which is typically used to manage short-term liquidity flows.

TREND/TREND LINE In technical analysis, trend is defined as a directional move over a period of time. There are three types – up, down and sideways. A trend line is a straight line that connects two or more price points, extending it into the future to act as a support or resistance. Trend lines are important in that they identify and confirm trends (See also **Support** and **Resistance**).

TROY OUNCE The traditional unit of weight used for precious metals, which was attributed to a weight used in Troyes, France, in medieval times. 1 troy ounce is equal to 1.0971428 ounces avoirdupois.

UNALLOCATED ACCOUNT An account where specific bars are not set aside and the customer has a general entitlement to the metal. This is the most convenient, cheapest and most commonly used method of holding metal. The holder is an unsecured creditor.

UNDERLYING The variable on which a futures, option or other derivative contract is based.

VALUE DATE The date agreed between parties for the settlement of a transaction.

VANILLA OPTION A standard transaction that is not tailored to the needs of either party. A plain vanilla option pays out the difference between the strike price of the option and the spot price of the underlying at the time of the exercise.

VARIATION MARGIN Additional margin, or collateral payable by an investor, resulting from an adverse movement in the price of the underlying asset in a forward, futures or options contract.

VEGA A measure of how much an option's price will change as the volatility of the underlying fluctuates.

VOLATILITY Refers to options. The rate of change in the price of the underlying asset. (See also **Implied Volatility** and **Historic Volatility**).

VOLUME On futures exchanges, the number of contracts traded in a session.

VRENELI Swiss gold coin with a face value of 20 francs issued as legal tender in the period 1897-1935. It had a fineness of 900 and a fine gold content of 0.1867 troy ounces.

WAFER Small, thin gold bars popular in the Middle East, South East Asia and Japan.

WAREHOUSE RECEIPT A warehouse or depository receipt is issued when delivery is taken on a futures exchange. It specifies the quantity and fineness of precious metal held.

WEIGHTED MOVING AVERAGE Used in technical analysis, a weighted moving average gives a greater weighting to more recent price data, as opposed to a simple moving average that gives equal weighting to all prices. (See also **Moving Average**).

WHITE GOLD A gold alloy containing whitening agents such as silver, palladium or nickel as well as other base metals. Often used as a setting for diamond jewellery.

WINDOW OPTION An option whose outcome depends on the performance of the underlying during the life of the option and whether that price lies between certain parameters on a certain observation day or days.

WRITER In options, the seller or granter of the option.

YIELD CURVE The relationship between interest rate yields and maturity lengths. The yield curve normally has a positive slope (i.e., upwards) because yields on long-term interest rates usually exceed short-term yields. An investor expects a higher return for holding an asset for a longer time, hence yields normally increase with maturity length.

ZERO-COST OPTION An option strategy under which one option is purchased by simultaneously selling another option of equal value. (See also **Min/Max**).

BAR WEIGHTS AND THEIR AGREED FINE GOLD CONTENT

Gross weight	Fine gold content in ounces troy		
	Bars 995.0 assay	Bars 999.0 assay	Bars 999.9 assay
1 Kilo	31.990	32.119	32.148
1/2 Kilo	15.995	16.059	16.074
1/4 Kilo	7.998	8.030	8.037
200 grams	6.398	6.424	6.430
100 grams	3.199	3.212	3.215
50 grams	1.600	1.607	1.608
20 grams	0.640	0.643	0.643
10 grams	0.321	0.322	0.322
5 grams	0.161	0.161	0.161
100 ounces	99.500	99.900	99.990
50 ounces	49.750	49.950	49.995
25 ounces	24.875	24.975	24.998
10 ounces	9.950	9.990	9.999
5 ounces	4.975	4.995	5.000
1 ounce	0.995	0.999	1.000
5 taels	5.987	6.011	6.017

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26 Iron Fe 55.845	27 Cobalt Co 58.933	28 Nickel Ni 58.693	29 Copper Cu 63.546	30 Zinc Zn 65.38
44 Ruthenium Ru 101.07	45 Rhodium Rh 102.91	46 Palladium Pd 106.42	47 Silver Ag 107.87	48 Cadmium Cd 112.41
76 Osmium Os 190.23	77 Iridium Ir 192.22	78 Platinum Pt 195.08	79 Gold Au 196.97	80 Mercury Hg 200.59

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