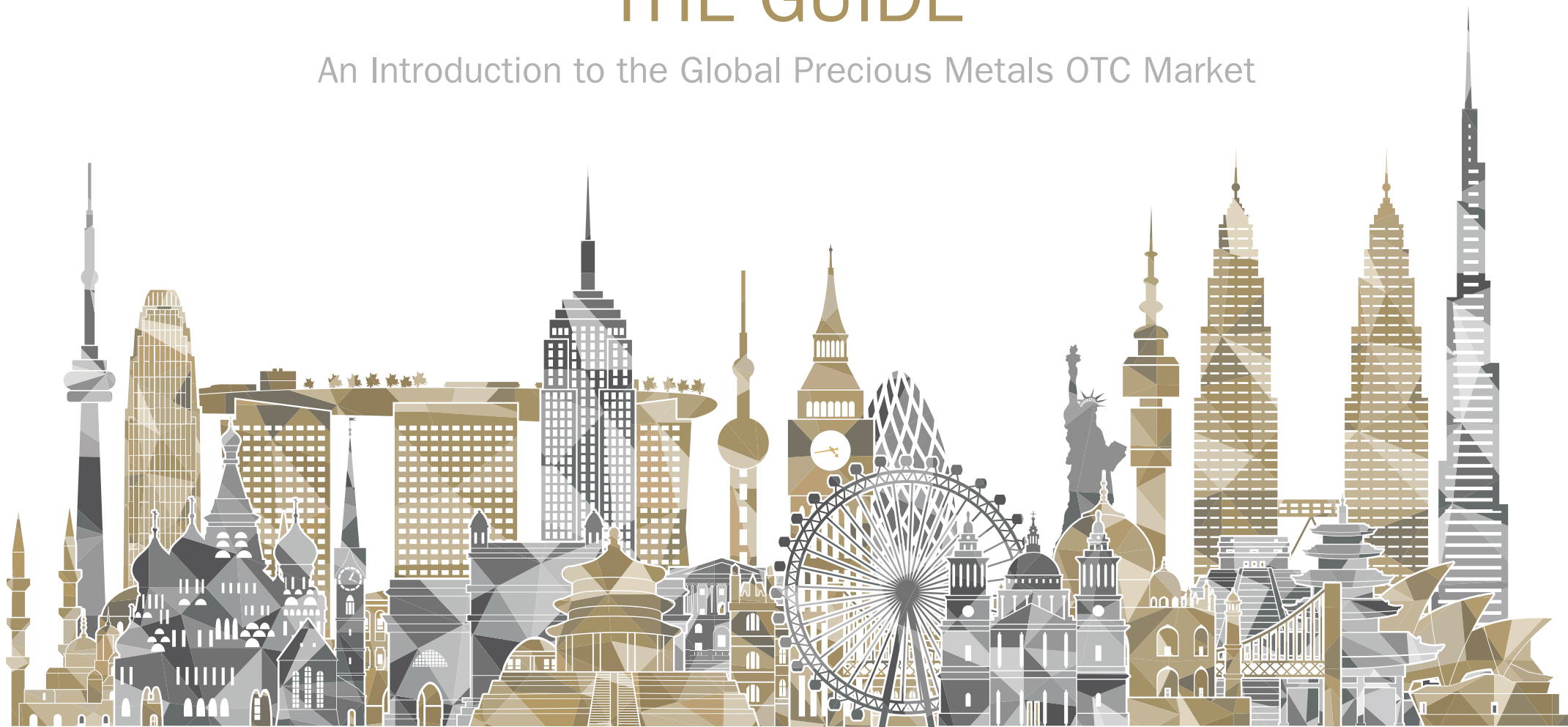


THE GUIDE

An Introduction to the Global Precious Metals OTC Market



Chief Executive's Foreword



I am delighted to present The Guide to the World's Precious Metals Market. It is intended to be a detailed and definitive primer for any investor or institution looking to understand and take part in the global Over The Counter (OTC) Precious Metals market, physically located in London. The Market is centred in London due to infrastructure (simply, you have to choose a location to hold the gold), but the participants and clients are located worldwide, with significant centres such as the US, China and India.

Given the bilateral or OTC nature of the Market, understanding all the acronyms and moving parts can be challenging for newcomers (and even some experienced players!). This Guide looks to make those acronyms and moving parts transparent. And also to give all participants, whether current or potential confidence in the market's governance and infrastructure.

This governance and continuous improvement is driven by the LBMA, the World's Authority for Precious Metals.

Many thanks in particular to Jonathan Spall, the Guide's Editor as well as Aelred Connelly our PR Officer for all the hard work in getting this off the ground.

I hope you enjoy The Guide!

Ruth Crowell

CEO LBMA

Editor's Note

This Guide to the precious metal markets was produced and is published jointly by the London Bullion Market Association (LBMA), the London Platinum and Palladium Market (LPPM) and London Precious Metals Clearing Limited (LPMCL). It replaces the previous guides issued in 2001 and 2008, and has been extensively updated and revised.

The objective of this Guide is to set out the way in which the global Over The Counter (OTC) precious metals markets operate. London is the most significant global centre for this important asset class and remains central to the world market whether the institutions trading OTC metal with each other are based in the UK or in Australia, India, China, Dubai, the USA and so on. London's key role in this market is due to a number of factors. Firstly, its history as the centre of the global precious metals market and the consequent high level of expertise that has developed over hundreds of years. Secondly, the physical settlement of precious metals across accounts in London and, hence, the compliance to the rules determined by the LBMA and LPPM regarding Good Delivery (see sections 5 and 6). Thirdly, the fortunate nature of the City of London's central time zone, which brings together miners, investors, fabricators and consumers from around the world.

In addition to analysing the workings of the worldwide OTC market in precious metals, this Guide also looks at the activities of the LBMA, LPPM and LPMCL and the role that they play in the successful trading of precious metals: a term that is used in this Guide to denote the four that are widely transacted – gold, silver, platinum and palladium.

The term PGM is also used. While an acronym for the Platinum Group Metals, it refers within the confines of this Guide, and following general market convention, to widely traded platinum and palladium solely, rather than the larger group from the periodic table, which also includes ruthenium, rhodium, osmium and iridium.

Naturally, considerable space is given to the importance of the Good Delivery List and the role that both the LBMA and the LPPM play in ensuring its relevance and the high standards that underpin it. This is in conjunction with LPMCL, which acts as a gate-keeper to the market, since a bar only becomes and remains London Good Delivery whilst it continues to be accepted by the vault manager at a London vault, thus allowing investors transacting in Loco London precious metals to have confidence in both the underlying asset as well as where it is stored.

Moreover, the quality assurance work undertaken by the LBMA and LPPM means that the maintenance and publication of the Good Delivery Lists for gold, silver, platinum and palladium are universally acknowledged as the de facto international standard for precious metals. In the refining industry, accreditation to these Good Delivery Lists is globally recognised as the benchmark standard for bars, due to the stringent criteria that an applicant must satisfy. The Lists are also used by many precious metals exchanges around the world to define in whole, or in part, the refiners whose bars are accepted in their own markets.

This Guide has been written to be read both from start to finish as well as to be dipped in and out of to clarify certain aspects as required. However, the latter necessitates a degree of repetition to ensure that the salient points are covered in each relevant section of the publication.

Of course, no work can ever be fully up to date and cover every aspect of the markets. Therefore, the most recent guidance should always be sourced from the LBMA's [website](#).

It should be noted that this document is a Guide to general market practices adopted in the precious metals industry. It is not a template for the responsibilities of the various market participants. The Precious Metal Code – published by the LBMA – is a set of rules that market participants must comply with when interacting with their clients and customers. Further details can be found on the LBMA's [website](#) as well as in section 16 of this Guide.

Jonathan Spall

G Cubed Metals Ltd

Acknowledgements

Many people have freely given their time and expertise to help in the compiling of this latest version of the Guide to the Global OTC Precious Metals Markets for which I am extremely grateful.

In particular, I would like to thank the Board, Executive and staff of the LBMA, the Management Committee of the LPPM, LPMCL, the Bank of England, Joseph Stefans, Timothy Green, Aelred Connelly and Philip Clewes-Garner.

For use of their data and findings: The World Gold Council, The Silver Institute, Johnson Matthey, GFMS Thompson Reuters, Metals Focus.

For use of images from their extensive libraries: the Goldsmiths' Company, AngloGold Ashanti, the Bank of England, the World Platinum Investment Council and Heraeus.

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SECTION 1

Introduction

Over The Counter (OTC)

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Introduction

London sits at the centre of the global precious metals markets.

Over The Counter (OTC)

Members of the global precious metals markets trade with each other and with their clients on a principal-to-principal, or bilateral, basis, which means that all risks, including those of credit, are between the two parties to a transaction. This is known as an 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 locations. Thus OTC markets offer far greater flexibility for clients compared to a futures exchange that operates with standardised contract sizes, delivery dates and settlement locations.

Metals Clear London

While other cities, and countries, specialise in futures exchanges or in the trading of small bars, London is the fulcrum of the international OTC market. So if a bank in Australia is trading precious metals with a gold mining company based in South Africa (for example) then almost inevitably the metal will settle over accounts in London. This is akin to the way in which London is the clearing centre for the British pound sterling, New York for the US dollar, Tokyo for the Japanese yen and so on.

Obviously, the United Kingdom is not the world’s foremost producer of precious metals. Nor is it the world’s leading consumer of gold, silver, platinum or palladium. So how did the City of London gain this role?

History

The roots of the London bullion market can be traced to the partnership between Moses Mocatta and the East India Company, which started shipping gold together towards the end of the 17th century. Shortly afterwards, while Sir Isaac Newton was master of the Royal Mint, gold in England was purposely overvalued so that it became more freely circulated than silver. This increased circulation quickly led to England having a gold-based coinage, whereas the rest of Europe remained silver-based until the 1850s.

The first gold rush of 1697 brought gold from Brazil into London, partly transported on ships owned by the East India Company, which had a Royal Charter from Queen Elizabeth I. This inflow of gold led to demand for a purpose-built London vault, which the Bank of England duly set up.

Its ‘bullion warehouse’ served the whole of the European market, as it does now, and was further stocked by the influx to London from the subsequent gold rushes in California, Australia and South Africa. The refineries that were set up to process this gold were located close to the Bank of England (owner of the St Luke’s refinery), which played a key role in being a custodian, regulator and facilitator of the lending and selling of gold by other banks.



1489 Sovereign

In 1750, the Bank set up the London Good Delivery List, which formally recognised those refineries that produced gold bars of a certain standard and could therefore be allowed to enter the London market. Today, this list is regarded as the only globally accepted accreditation for the bullion market, ensuring that the wholesale bullion bars traded in the market meet the standards and quality required for Good Delivery status.



The Bank of England Bullion Receiving Office

By 1850, five companies – N M Rothschild & Sons, Mocatta & Goldsmid, Pixley & Abell, Samuel Montagu & Co. and Sharps Wilkins – were already established and flourishing. The term ‘London Gold Market’ originally referred solely to these five companies, which had been formed to oversee the operation of the gold market in London. In 1919, the London Gold Market set up the first Gold Price setting at Rothschild’s offices. The London Gold Market was also responsible for Good Delivery accreditations and the maintenance of the resulting List of Acceptable Melters and

Assayers, as the List was originally known. The fact that London is at the centre of international time zones has always facilitated it being the optimum place from which to operate in the market.

The Market’s five original members remained essentially unchanged for many years. However, by the 1980s, the development of the global precious metals industry was such that the Bank of England recognised that the custody, maintenance and regulation of the Good Delivery List required an independent body. This was the catalyst for the founding of the LBMA in 1987, but while London can trace its history in precious metals back several hundred years, the human race’s fascination with precious metals, gold in particular, goes back several millennia.

There is evidence suggesting that the Egyptians were mining gold underground as far back as 2000 BCE, with rivers giving up nuggets of the metal even longer ago than that. Obviously, much has changed in the intervening 4,000 years, not least with the first silver coins thought to have been minted some 2,700 years ago, with gold ones following on 200 years later.

It is of fundamental importance that when these precious metals are being used for monetary purpose – both as a medium of exchange as well as a store of value – then the purity of that metal must be of recognised quality. Clearly, the Bank of England understood this when it undertook that task over 250 years ago. However, the notion of acceptable quality dates considerably further back in history and the first attempts at applying uniform standards took place over 1,500 years ago in the Byzantine Empire. The oldest assayers in the United Kingdom, the Goldsmiths’ Company, has been in existence a rather more modest 700 years or so and traces its history back to the early part of the 14th century.

“In 1300 King Edward I passed a statute requiring gold and silver to be of a defined standard and requiring ‘les Gardeins du Mester’ (Guardians of the Craft) to test it and mark it with the leopard’s head. This was supposedly taken from the royal arms and later known as the King’s mark. This is the first legal recognition of the Company, and the beginning of hallmarking in Britain. In 1327 the Company received its first royal charter, giving it the right to enforce good authority, the standards within the trade and emphasising its standing over provincial goldsmiths.” (Extract from the website of the [Goldsmiths’ Company](#)).

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London Good Delivery

While the earliest standards tended to concentrate on individual articles made of precious metals, the Bank of England formally recognised those refineries that produced gold bars to the required standard in 1750 via the London Good Delivery List for gold. Today, the responsibility, for both gold and silver lists, is managed by the London Bullion Market Association (LBMA).

Platinum and palladium, by contrast, are relatively recent additions to human knowledge. Platinum was first isolated in the 18th century and palladium in the 19th. London has always been an important centre for these metals as well, with trading being established in the 20th century and usually taking place alongside the longer-established gold and silver.

In 1973, the London Platinum Quotation was introduced – a forerunner of the fixings and subsequently the auctions – 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 which they would accept as Good Delivery.

In 1987, the informal trading, which 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 (LPPM). Simultaneously, the LPPM began management of the Good Delivery Lists for platinum and palladium.

LBMA and LPPM

The LBMA is the pre-eminent body for the world's largest and most important market for gold and silver bullion. The international bullion market is centred in London, with a global client base comprising all the central banks that manage their gold reserves, private sector investors, mining companies and others. The LBMA's membership incorporates approximately 150 firms, including traders, refiners, producers, fabricators, as well as those providing storage and secure carrier services.

The LPPM can claim similar credentials for platinum and palladium, with its operations also centred in London and more than 50 members involved in the trading, mining and refining of the PGMs.

Given the different profiles of the various members of both organisations, membership categories are divided into subcategories. Details of these, along with the respective members, can be found on the websites of the LBMA and LPPM.



Barricks Pueblo Viejo Gold Mine in the Dominican Republic

Precious Metals

While gold, silver, platinum and palladium can be grouped together under the generic term of precious metals, the logistics of mining them as well as the rationale for owning them vary a great deal. Indeed, gold is used in few industrial processes (in part due to its cost) and its attraction is often cited more generally as being a hedge against inflation or uncertainty or as a store of value, rather than anything else. Silver, on the other hand, straddles more comfortably the different fields of investment and industrial use (it is primarily used in photovoltaic cells but also still in photographic film) and platinum and palladium sit more solidly in the industrial metal camp. The primary use of platinum and palladium is in the catalytic converters used to reduce unwelcome emissions from diesel (platinum) and petrol (palladium) engine vehicles.

Section 19 lists some key facts and figures in mining, as well as in the usage, of all four metals.

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London Bullion Market Association

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London Bullion Market Association (LBMA)

The LBMA is the international trade association that represents the market for gold and silver bullion, which is centred in London but which has a global client base, including the majority of the central banks that hold gold, private sector investors, mining companies, producers, refiners and fabricators. Its membership numbers some 150 companies, which are actively involved in the Loco London bullion market or which provide services to the market, such as supervising, assaying and transportation, and indeed to the miners of the metals themselves.

The bullion market is a truly international market, in that although dealers in other bullion trading centres may trade in their local markets and on commodity exchanges, they also deal extensively in 'Loco London' metal. This term means that the gold or silver will be settled in London by a member of London Precious Metals Clearing Limited (LPMCL), either by way of book transfer or physically. The location of the underlying metal will be referred to within the contract with the customer, whether the trade is on an unallocated or allocated basis, but at all times, the metals remain under the physical control of the LPMCL member.

The on-going work of the Association covers quality assurance regarding market participants and refiners, setting and monitoring refining standards, creating trading documentation and fostering the development of good trading practices. The LBMA's main role is acting as the voice of the precious metal market as well as being a contact point for regulators, investors and clients. It ensures the continued evolution and health of a marketplace for precious metals in which all participants can operate with confidence. Further, it co-ordinates market clearing and vaulting, promotes good trading practices and develops standard documentation. It also sets objective criteria for institutions wishing to enter the market as traders and as custodians. Additionally, during times of crisis, the LBMA is a key player to help avoid any potential market disruption. This was most notably demonstrated during the winding-down of the Silver Fixing in the first half of 2014, when the LBMA co-ordinated a market response in order to make sure there was continuity and the market retained a silver benchmark (now known as the LBMA Silver Price) – more details are provided in section 11.

Central to the LBMA's quality assurance work is the maintenance and publication of the Good Delivery Lists for gold and silver, which are universally acknowledged as the de facto international standards. In the refining industry, accreditation to the LBMA Good Delivery List is globally

recognised as the benchmark for the quality of gold and silver bars, due to the stringent criteria that an applicant must satisfy. The List is used by many precious metals exchanges around the world to define in whole, or in part, the refiners whose gold and silver bars are accepted in their own markets.

Total refined gold production by the refiners on the LBMA's Gold Good Delivery List tends to be even higher than total world mine production, with the difference reflecting the recycling of material by LBMA Good Delivery refiners including converting 400 ounce bars (also known as 'large' or 'market' bars) or, indeed, scrap/recycled metal into kilobars. Newly mined gold handled by refiners on the List comprises approximately 85% – 90% of world production.

Additionally, in order to respond to US legislation such as Dodd Frank (signed into law by President Obama on 21 July 2010) and legislation concerning conflict minerals, the LBMA took its role as accreditor of the world's gold refiners and expanded the scope of its requirements, to include corporate social responsibility, by the creation of the Responsible Gold Guidance (RGG). This framework, based on the OECD Due Diligence Guidance, gives assurance to investors and consumers that all London gold stocks are conflict-free as well as compliant with international anti-money laundering laws.



The LBMA's office in the heart of the City of London

Without these efforts, there would have been serious disruption to the international gold market when US laws came into force. The notion of responsible metal sourcing has now been expanded into the other precious metals, and the wider category of Responsible Sourcing Guidance is discussed more fully in section 16.

Further, the LBMA promotes good trading practices and develops standard documentation as appropriate. The LBMA has always worked closely with London Precious Metals Clearing Limited (LPMCL), which organises and co-ordinates bullion clearing and vaulting in London, and develops standard documentation appropriate to those activities (more details are provided in section 7). However, in 2017 the LBMA assumed responsibility for the administrative functions of the LPMCL (see section 7 for further details). The LBMA also enjoys a close working relationship with the LPPM and, indeed, there is cross-representation on the Management Committees/Boards of each organisation.



The Members

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

Market Making Members are required to quote prices to each other upon request throughout the London business day, for agreed minimum quantities and tenors in both gold and silver.

The three products relevant to LBMA market making are spot, forwards and options. LBMA Market Makers provide the service in one, two or all three products. They are required to make markets by quoting two-way prices in both gold and silver to the other Market Makers in the same products. Market Makers offering spot, forwards and options are known as Full Market Makers and those providing only one or two of the products are known simply as Market Makers.

In 2017 the LBMA introduced a new category of Exchange Affiliate Membership. In addition to full membership, suitably qualified organisations whose activities are relevant to the London Bullion Market may be affiliated to the LBMA Associates. This is a subsidiary classification of Full Membership which is solely open to any Market Exchange operating company that wishes to become a Member of the LBMA.

LBMA members are organisations participating throughout a precious metals' transformation from rock to its ultimate form as an investment bar, a piece of jewellery or component in an industrial process. This starts with providing financing for the miner to source ore several kilometres beneath the Earth's surface before being transported to a refinery, to be made into bars, which are then stored and protected in a vault, before being sold or perhaps manufactured into the required form. The membership is certainly broad-based in both scope and expertise. Further details on all aspects of membership can be found on the LBMA's [website](#).

Silver Good Delivery bars

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Evolution of the LBMA

The roots of the London bullion market can be traced to the partnership between Moses Mocatta and the East India Company, which started shipping gold together towards the end of the 17th century (this is dealt with more fully in section 1). It was, however, the introduction of the London Silver Fixing in 1897 and the London Gold Fixing in 1919 that formally marked the beginnings of the market's structure and of the interaction between members that has created the marketplace as 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.

Among the more notable changes that the LBMA has undergone in recent years is to have become the intellectual property holder of the four precious metals spot price benchmarks, namely, the:

- LBMA Gold Price
- LBMA Silver Price
- LBMA Platinum Price
- LBMA Palladium Price

Full details of these important global benchmarks follow in section 11.

In 2016, the LBMA also underwent two further noteworthy changes. The first extended the scope of the Association to incorporate the platinum and palladium markets. This allows the LBMA to formally support its members' activities in the PGM market, particularly with regard to regulatory issues. This change also reflects the LBMA's ownership of the intellectual property rights for the platinum and palladium price benchmarks. The LPPM will continue in its current roles and responsibilities, including most importantly the accreditation of the Platinum and Palladium Good Delivery Lists.

The second change was to further enhance the governance of the Association. The UK Corporate Governance Code was incorporated and determines both the Constitution as well as the operation of the Board. While it is vital for the Board to have a strong voice for its members, it is important that any actual or perceived conflicts between these parties are balanced by having independence on that Board. This independence protects the interests of the wider membership as well as the individuals themselves serving on the Board. To address this, the LBMA has already appointed an independent Non-Executive Chairman and one of up to two additional Non-Executive Directors (NEDs).

Application Requirements

Companies applying for membership of the LBMA need to name three LBMA members as sponsors when submitting their application. These should be members with which the applicant has had a bullion-based trading relationship for at least one year. The LBMA requires each sponsor to supply a letter of recommendation, confirming the applicant's suitability for membership, together with a description of the scope and duration of their bullion-based relationship. Guidance on membership, including appropriate sponsors, can be obtained from the LBMA on request.

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London Platinum and Palladium Market

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LPPM

The London Platinum and Palladium Market (LPPM) is a trade association that acts as the co-ordinator for activities conducted on behalf of its members and other participants in the market. It acts as the principal point of contact between the market and regulators/other official bodies, such as Her Majesty’s Revenue & Customs (HMRC), and 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 a regime of Proactive Monitoring whereby refiners on the List have, under a continuous three-year rolling programme, their assaying ability independently tested in addition to being required to provide the LPPM, in confidence, with certain production and financial data.

In all these respects, it is very much a sister organisation of the LBMA except that its primary responsibility is for platinum and palladium rather than gold and silver. This close relationship is enhanced by cross-representation on each others’ Boards/Management Committees.

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 but are involved in the platinum and palladium markets, as well as the newly created category of LPPM Affiliated Exchange.

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

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 provide the full range of services provided by Full Members. Two Full Members or one Full and one Associate Member are required as sponsors for Associate membership of the LPPM.



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Affiliate membership is open to those companies that fail to meet the normal requirements of Full or Associate membership as described above but that are recognised by the Management Committee as being involved with or offering support to the global platinum and palladium markets. Two Full or Associate Member sponsors are required for Affiliate membership of the LPPM.

LPPM Affiliated Exchange is a newly created level of membership and offers access to the LPPM Good Delivery List and the right of the Exchange to use it as a delivery standard. Any Exchange involved in Platinum and Palladium Group Metals may apply to the Management Committee for LPPM Affiliated Exchange membership. Two Full Member sponsors are required for this membership.

LPPM members are organisations participating throughout a precious metals' transformation from rock to its ultimate form as an investment bar, a piece of jewellery or component in an industrial process. This starts with providing financing for the miner to source ore several kilometres beneath the Earth's surface before being transported to a refinery, to be made into bars, which are then stored and protected in a vault, before being sold or perhaps manufactured into the required form. The membership is certainly broad-based in both scope and expertise.

The current membership list, as well as up-to-date membership requirements and details of the application process are available on the LPPM [website](#).

Market History

While London has been an important trading and settlement hub for gold and silver for centuries, platinum and palladium are more recent additions, with the London Platinum Quotation introduced in 1973. This was a forerunner of the fixings and was a twice-daily indication of the market price for spot platinum, reported by some of the principal companies dealing in the metal. The London Palladium Quotation was introduced subsequently.

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. Although, as of 1 December 2014, these were in turn replaced by the LBMA Platinum Price and the LBMA Palladium Price, which were launched with the agreement of the LBMA.



Assay furnace

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SECTION 4

The Price

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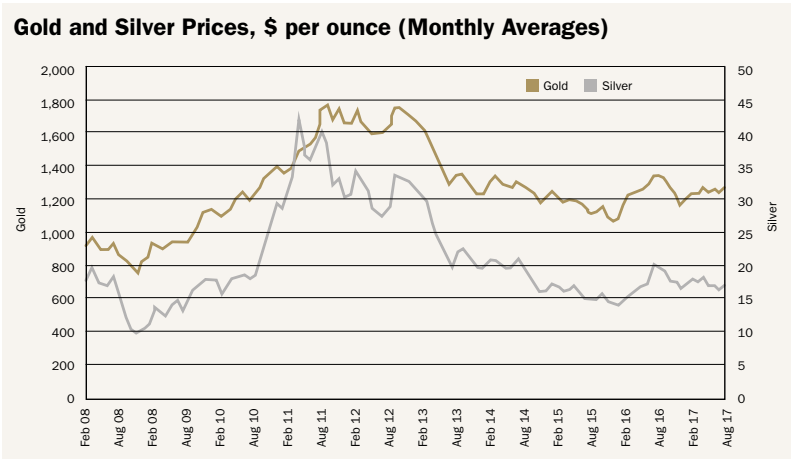
The Metal not the Account



The Price

It is a familiar sight in the media to see the prices of the four precious metals displayed. These are generally expressed in terms of dollars per ounce but may bear little resemblance to the price of one ounce of the metal in a piece of jewellery or in a small bar. So what does this number actually mean?

There are a number of factors that need to be considered to answer this. The first is that the price is quoted per troy ounce.



Ounce

The ounce that many people are used to in their everyday lives is the avoirdupois ounce of which there are 16 to the pound. This is equivalent to 28.3495 grams.

However, precious metals are not measured in avoirdupois ounces but in troy ounces. There is some debate as to the origins of the term. However, it is generally thought to refer to a medieval fair that was held in the French town of Troyes and where gold and silver could be purchased. The troy ounce is approximately 1.1 times larger than the avoirdupois ounce and is equivalent to 31.1035 grams.

Throughout this Guide, whenever the term ‘ounce’ is used, it will invariably refer to troy ounces.

To be a little more specific – for gold, ‘ounce’ refers to 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 palladium, it represents one ounce of material of which a minimum of 999 parts in every 1000 will be silver and 999.5 parts in every 1000 will be platinum or palladium, respectively. Fineness is defined more fully later in this section.

In market parlance, gold is traded on the wholesale market with a minimum purity of ‘two nines five’ (995 or 99.5% pure), while silver is ‘three nines’ (999 or 99.9%), and platinum and palladium are ‘three nines five’ (9995 or 99.95%). There is a conversion table of weights in section 18.

What

It takes little imagination to realise that the smaller the increment of metal that is purchased, the more expensive it is likely to be in terms of the weight purchased, since there will be many fixed costs associated with its manufacture. Therefore, a 1 gram bar of precious metal will be considerably more expensive on a like-for-like basis than a bar weighing one troy ounce.

However, the prices that appear in the media normally represent the wholesale market and, hence, are for considerably larger sizes, i.e. what are referred to as either ‘market’ or ‘large’ bars, but more properly as ‘London Good Delivery’ bars. The LBMA defines the requirements for gold and silver, and the LPPM the requirements for platinum and palladium. The full specifications are laid out in sections 5 and 6. For the purposes of this section of the Guide, they are broadly defined as:

- Gold:** a bar weighing between 350 and 430 troy ounces. Minimum of 995 purity
- Silver:** a bar weighing between 750 and 1,100 troy ounces. Minimum of 999 purity
- Platinum:** a bar weighing between 1 and 6 kilograms (32.151 to 192.904 ounces). Minimum of 9995 purity
- Palladium:** a bar weighing between 1 and 6 kilograms (32.151 to 192.904 ounces). Minimum of 9995 purity

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Therefore, in the case of gold, the published price refers to a fine troy ounce of the metal in a bar weighing between 350 and 430 troy ounces, which meets all of the required standards (as defined in section 5).

Refiners of gold and silver have to satisfy the LBMA Good Delivery Rules that their bars meet the stringent requirements set by the Association, whilst refiners of platinum and palladium have to similarly satisfy the Rules set by the LPPM. The LBMA and LPPM accreditations are the internationally accepted standards of product and refinery quality. Full details of the requirements for joining the Good Delivery Lists of the precious metals can be found on the [LBMA](#) and [LPPM](#) websites.

Where

The standard delivery location of gold and silver is London – also known as Loco London. This is ultimately an account held with a clearing bank for precious metals and backed by metal held in a vault in London that forms part of the clearing system. (The role of London Precious Metals Clearing Limited – LPMCL – is covered in more detail in section 7).

Generally, in the case of gold, metal in a predominantly producing centre (such as South Africa) will be at a discount to the London price, while that in a predominantly consuming country (India) will be at a premium to the London price.

Loco London as a delivery location is the default for gold and silver, while for platinum and palladium, it is more nuanced and must be specified as to whether it is Loco London or Loco Zurich that is required. If not so specified, Loco London is the default location.

When

Delivery of currency and metal is effected two business days after the transaction date on the so-called ‘spot date’. Excluding public holidays, it means that a trade entered into on a Monday will settle on a Wednesday and a trade entered into on a Friday will not settle until the following Tuesday.

However, while there must be two good London business days between trade date and spot, if a US holiday falls between the trade date and what would otherwise be the good spot date from the London holiday schedule, the US holiday is generally ignored. It is worth noting though that metal will not settle on US holidays.

Sometimes it can be the case that certain institutions will prefer to have two clear business days in each of London and New York to ensure that there is sufficient time for both currency and metal to settle. Therefore, it is worth clarifying with the quoting institution to ensure that any possibility of confusion is minimised.

Currency

Precious metals are, by default, quoted in terms of US dollars per troy ounce. However, prices can generally be obtained against any freely convertible currency.

The Price

Bearing in mind the above conditions, the generic price quoted for a precious metal by the media almost inevitably will be for a troy ounce of the metal delivered Loco London, for gold and silver. In the case of platinum and palladium, whether the delivery location is London or Zurich should be specified, but if no location is noted, then the assumption is likely to be that the metal will be settled Loco London. The metal will be credited/delivered on the spot date in terms of US dollars and will also conform to the rules regarding Good Delivery bars.

The Reference

Based on the Loco London price, dealers can offer material of varying fineness, bar size or form (for example, grain/sponge) at premiums (or discounts depending on circumstances) to cover the cost of producing small, exact weight bars or bars of a fineness above (or below) the minimum 995 fine (in the case of gold).

This holds true across all four precious metals that can then be shipped to destinations around the world at prices inclusive of freight and insurance.

Equally, metal can also be quoted at a discount to the Loco London price should there be insufficient demand for gold kilobars in India, for example, or should bars not have been produced by a Good Delivery List refiner and, hence, need to be ‘upgraded’, and so on.

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Loco London or Loco Zurich?

While gold and silver have always been predominately settled over accounts in London – so called Loco London trading – traditionally, platinum and palladium have traded Loco Zurich – in other words, over accounts that were held at one of the then three large Swiss banks (Credit Suisse, Union Bank of Switzerland and Swiss Bank Corporation). However, following the merger of Swiss Bank Corporation and Union Bank of Switzerland (which formed UBS) and the substantial scaling back of the market presence by Credit Suisse, there has been increasing interest for the PGMs to trade as a predominately Loco London market.

However, while most PGM market makers do solely quote for Loco London metal, between themselves, the picture is rather more nuanced for customer transactions. Thus delivery location should be specified prior to requesting any prices (for settlement over London or Zurich accounts) and, indeed, there may be a price difference between the two locations depending on market conditions. This differential should never get too out of line or be that long-lasting, as metal can be shipped between the two centres fairly simply and rapidly.

London skyline

Fineness

For gold, the trading unit 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 palladium, 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, respectively.

Hence, 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 gold or silver bars or platinum or palladium plates or ingots.

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Assaying

The process by which fineness is determined.

Benchmarks

The prices of the four precious metals quoted in the media may also be the global benchmark precious metals prices (LBMA Gold, Silver, Platinum and Palladium Prices). This important topic is covered in more detail in section 11.

The Metal not the Account

Clearly, gold, silver, platinum and palladium are all traded metals. It is an important distinction that it is not unallocated or allocated metal that is traded, but the metal itself. The terms ‘allocated’ and ‘unallocated’ simply reflect the type of account over which the metal clears post trading of the underlying metal. These types of accounts are covered more fully in section 8.



Aqua Regia dissolution

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SECTION 5

London Good Delivery – Gold and Silver

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London Good Delivery – Gold and Silver

Background

As mentioned in the introduction, the Bank of England formally recognised those refineries that produced gold bars to the required standard in 1750 via the London Good Delivery List for gold. Today, the LBMA handles that responsibility for both gold and silver under the auspices of its Physical Committee, which has to be satisfied that the bars meet the stringent, globally accepted, requirements set by the Association.

Refiners of platinum and palladium have to similarly satisfy the Management Committee of the LPPM. The LBMA and LPPM Good Delivery accreditations have become the internationally accepted standards of product and refinery quality. This is covered more fully in sections 5 and 6.

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

Gold and Silver

Only gold and silver bars that meet the LBMA's Good Delivery standards are acceptable in settlement of a Loco London contract. The LBMA benchmarks and regulates the acceptable requirements for large gold and silver bars through its continuously updated publication of the London Good Delivery Lists. These standards, recognised throughout the world, ensure that accredited refiners continue to maintain the high standards necessary for listing. The Lists can be accessed on the LBMA's [website](#).

Gold Good Delivery bars

The Lists are also used by many precious metals exchanges around the world to define in whole, or in part, the refiners whose bars are accepted in their own markets. Exchanges utilising the LBMA's work in this field include ICE, Borsa Istanbul, CME Group and TOCOM, as well as the Singapore Bullion Market Association, Shanghai Gold Exchange and Dubai Multi Commodities Centre.

Requirements for Listing

The requirements for listing involve a stringent set of criteria, which include a minimum level of production and tangible net worth, with a rigorous technical assessment to review casting, refining and assaying abilities. To ensure that the high standards are maintained, Accredited Good Delivery refiners are subject to on-going testing under the LBMA's Proactive Monitoring Programme. Refiners that no longer meet the minimum standards, or those that decide to stop producing Good Delivery bars, are transferred to the Former Lists for Gold and Silver.

LBMA Physical Committee

The Physical Committee is made up of industry experts from the physical bullion market. It is responsible for monitoring, developing and protecting the Good Delivery Lists and works closely with sub-groups such as the LBMA Referees and the LBMA's Vault Managers Group. It also ensures that standards are maintained, with emphasis on continuous improvement and transparency of the market. The Committee meets approximately every month throughout the year.

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LBMA Referees

Good Delivery Referees are refiners appointed by the LBMA to assist with the maintenance of the Good Delivery System.

The technical assessment of applicants for listing includes/covers the:

- proactive monitoring of refiners on the List, and
- provision of technical advice on a range of topics

Good Delivery Rules

The Good Delivery Rules provide information for existing refiners and the banks that work with them, as well as the necessary guidance for refiners seeking accreditation. These specifications include the acceptable fine ounce weight, purity and physical appearance (including markings and surface quality). To view a full copy of the most up to date Rules, please refer to the LBMA's [website](#).

Only bars that meet Good Delivery standards are acceptable in the physical settlement of a Loco London gold or silver transaction. The high level of consistency within the global OTC market is maintained by ensuring both refiners and vaults implement the Good Delivery Rules relating to a bar's assay, appearance, weight, and safe handling and stacking. The main specifications for Good Delivery gold and silver bars are summarised below. No other refined gold or silver products produced by accredited refiners fall within the scope of the Good Delivery Lists. For further details, please also see section 7 regarding the work of the London Precious Metal Clearing Limited.

The current (as of July 2017) specifications are listed below. For detailed, and latest information, please refer to the LBMA's [Good Delivery Rules](#).

Gold Bars

Bars typically weigh a few ounces either side of 400 troy ounces (roughly 12.5 kilos) but the precise specifications are:

Weight: Minimum gold content: 350 fine troy ounces (approximately 10.9 kilograms) Maximum gold content: 430 fine troy ounces (approximately 13.4 kilograms). The gross weight of a bar should be expressed in troy ounces, in multiples of 0.025, rounded down to the nearest 0.025 of a troy ounce.

Dimensions: The recommended dimensions for a Good Delivery gold bar are approximately:

Length (Top): 250 mm +/- 40 mm.

Undercut* range: 5-25 degrees

Width (Top): 70 mm +/- 15 mm.

Undercut*: 5-25 degrees

Height: 35 mm +/- 10 mm

*The undercut refers to the degree of slope on the side and ends of the bar and is calculated using the following formula: $90 \text{ degrees (ATAN(H/((T-B)*0.5)))}$, where H=Height, T= Top, and B=Bottom dimensions of the bar, the bottom dimension being measured to the theoretical sharp edges.

Fineness: The minimum acceptable fineness is 995.0 parts per thousand fine gold.

Marks: Serial number
Assay stamp of refiner
Fineness (to four significant figures)
Year of manufacture

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Silver Bars

Weight: Minimum silver content: 750 troy ounces (approximately 23 kilograms) Maximum silver content: 1100 troy ounces (approximately 34 kilograms) However, it is recommended that ideally refiners should aim to produce bars within the following weight range:

Minimum silver content: 900 troy ounces (approximately 29 kilograms)

Maximum silver content: 1050 troy ounces (approximately 33 kilograms)

The gross weight of a bar should be expressed in troy ounces in multiples of 0.10, rounded down to the nearest 0.10 of a troy ounce.

Dimensions: The recommended dimensions for a Good Delivery silver bar are approximately:

Length (Top): 300 mm +/- 50 mm. Undercut:* 5-15 degrees

Width (Top): 130mm +/- 20 mm. Undercut:* 5-15 degrees

Height: 80 mm +/- 20

*The undercut refers to the degree of slope on the side and ends of the bar and is calculated using the following formula: $90 \text{ degrees } (\text{ATAN}(H/((T-B) * 0.5)))$, where H=Height, T= Top, and B=Bottom dimensions of the bar, the bottom dimension being measured to the theoretical sharp edges.

Fineness: The minimum acceptable fineness is 999.0 parts per thousand silver.

Marks: Serial number
Assay stamp of refiner
Fineness (to three significant figures)
Year of manufacture



Vault storage of Silver Good Delivery bars

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Kilobars

A frequent question that is posed is whether or not kilobars (for example) constitute London Good Delivery for gold? As they do not meet all the criteria listed above, they are not regarded as Good Delivery bars. Indeed, no bar other than those listed above for gold and silver, and in the next section for platinum and palladium, can be considered Good Delivery.

However, as the LBMA has become the de facto authority on quality standards applied to gold and silver bullion, it will, when appropriate, collaborate with geographically relevant organisations to ensure the highest possible standards are maintained and the appropriate level of support is provided to the Good Delivery List (GDL) refiners.

Indeed, following the joint meeting between the LBMA and the Shanghai Gold Exchange (SGE) at the LBMA Forum (25 June 2015), the 9999 ('four nines', in market parlance) gold kilobar specification was issued in Shanghai on 1 July 2015.



The specifications for a 1kg 9999 Gold Bar ('four nines kilobar'), as endorsed by the LBMA and SGE are:

Weight:	1000g minimum
Dimensions:	The kilobar should be rectangular. The dimensions should fall within the following ranges: Length: 80 – 120mm Width: 40 – 60mm Height: 7 – 14mm
Fineness:	The minimum acceptable fineness is 999.9 parts per thousand fine gold.
Marks:	Refiner's Stamp or Logo Serial Number Weight (1kg or 1000g) Fineness (to four significant figures) Certificate of Analysis (COA)

A Certificate of Analysis must accompany each kilobar on dispatch from the refiner and must include the following information:

	Refiner's Stamp or Logo Serial Number Weight (1kg or 1000g) Fineness (to four significant figures) Approved Signature
Notes:	Serial numbers must be unique and non-reusable. Serial numbers must be referenced against inventory lists to provide traceability. Specifications are for cast bars.

The kilobar standard focuses on the fineness of the gold and allows for the inclusion of all existing refiners' current production, including all SGE and LBMA accredited refiners. It also streamlines the information on Certificates of Analysis to focus on the critical information required. It is hoped that this joint recognition of a single standard will greatly assist LBMA and Shanghai Gold Exchange members trading in Shanghai and in other 9999 kilobar markets around the world. This type of initiative demonstrates the type of co-operation and, ultimately, mutual endorsement that the LBMA is striving to create between gold markets, and it is intended that the LBMA will continue to work together with markets around the world to broaden and strengthen standards.

Gold kilobars

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The LBMA is currently working with exchanges within India to produce a 995 ('two nines five', in market parlance) gold kilobar specification as opposed to that for the 9999 listed above.

The Gate-Keepers

It is worth noting that in addition to the above criteria regarding a Good Delivery bar produced by an accredited refiner, it only becomes, and remains, London Good Delivery once it has been, and continues to be, accepted by a London vault.

The vault managers are precious metal experts who manage the vaults approved by the individual members of LPMCL and who have achieved LBMA Approved Weigher status (certified vaults are listed in the latest GDL Rules). Vault managers are thus the gatekeepers of the London market, and a Good Delivery bar only becomes and remains London Good Delivery to the extent that a vault manager is willing to accept such a bar into the London vault and thus into Loco London. If any bar fails to meet the stringent LGD requirements then it will be rejected and returned to the refiner that originally produced it.

Hence, vault managers play a pivotal quality control role in maintaining and sustaining the Good Delivery standards across the market as metal moves in and out of their custody. They also play a Quality Assurance role in terms of the product invested in by the client whose metal is placed in their custody.

More information is provided in section 7.

Why London Good Delivery is Important

Clearly, it is important for an investor to know that the bar of precious metal they have purchased is exactly what it purports to be – of the correct metal, weight and assay, and so on. However, only bars of the requisite size (as well as the other features listed above) can gain London Good Delivery status.

So that while a standard 400 troy ounce bar, in the case of gold, can meet all the listed requirements and be part of the Good Delivery List, the same can never be true of a 1 ounce bar, for example, of any of the four widely traded precious metals.

The key feature is that the Good Delivery List underpins the wholesale market. So if an investor is buying precious metals (be they held in allocated or unallocated accounts), the bars underlying those holdings are fungible. In other words, it is irrelevant whether the gold was mined (and refined) in South Africa, Russia, South or North America, or indeed any of the gold-producing countries of the world or was created from scrap in, perhaps, Switzerland. Additionally, the vaults that form part of the global OTC market will have ensured that, for London Good Delivery purposes, only metal that has been produced by an LBMA accredited refiner and meets the Good Delivery Rules is held in their custody and thus will also conform to the LBMA's requirements on Responsible Sourcing Guidance, see section 16 for further details.



A selection of Gold Good Delivery bars, celebrating the 260th anniversary of the Gold Good Delivery List

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SECTION 6

Good Delivery – Platinum & Palladium

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Platinum Plate or Ingot

Palladium Plate or Ingot

Weight

The Gate-Keepers

Why London Good Delivery is Important



Good Delivery – Platinum & Palladium

Background

A primary function of the LPPM is its involvement in the promotion of refining standards by maintenance of the LPPM Good Delivery List and a regime of Proactive Monitoring whereby refiners on the LPPM Good Delivery List have their assaying ability independently tested, under a continuous three-year rolling programme, in addition to being required to provide the LPPM, in confidence, with certain production and financial data.

Refiners of platinum and palladium have to satisfy the Management Committee of the LPPM in order to be accepted onto the Good Delivery List. LPPM Good Delivery accreditation has become the internationally accepted standard of product and refinery quality.



A selection of ingots

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

The LPPM Rules for Good Delivery are for both Loco London and Loco Zurich and the current (as of July 2017) specifications are listed below. Please see the full details for the most up-to-date [Good Delivery Rules](#).

Platinum Plate or Ingot

Form:	Plate or Ingot
Weight:	The maximum weight permitted is 6 kilograms (192.904) troy ounces. The minimum weight permitted is 1 kilogram (32.151 troy ounces)
Purity:	At least 99.95% platinum
Markings:	Each plate or ingot must bear: The producer's recognised mark The letters PT or PLATINUM with a stamp indicating the purity An individual number or mark Year of manufacture The weight in grams, kilograms or troy ounces (if in grams to one decimal place, if in kilograms to four decimal places and if in troy ounces to three decimal places).
Appearance:	Smooth, free from cavities and easy to handle

Palladium Plate or Ingot

Form:	Plate or Ingot
Weight:	The maximum weight permitted is 6 kilograms (192.904) troy ounces. The minimum weight permitted is 1 kilogram (32.151 troy ounces)
Purity:	At least 99.95% palladium
Markings:	Each plate or ingot must bear: The producer's recognised mark The letters PD or PALLADIUM with a stamp indicating the purity An individual number or mark Year of manufacture

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Weight

The principle applied to the weighing of LPPM Good Delivery platinum and palladium plates or ingots is that the weight stamped on a plate or ingot should be the minimum weight. The producer/refiner should expect to be credited with the stamped weight, and for any subsequent physical movement of such plate or ingot out of the clearing system should also reflect the stamped weight on the relevant weight list. The LPPM however accepts that there can be minor differences in weighing equipment, and for practical and clarity purposes has set out the following rules:

Weight Stamping:	The weight in grams, kilograms or troy ounces (if in grams to one decimal place, if in kilograms to four decimal places and if in troy ounces to three decimal places).
Rounding:	Weight lists shall be produced in troy ounces or converted from kilograms using the following formula, namely a standard conversion rate from kilograms to troy ounces of 32.1507465 to produce a five-decimal figure. If upon conversion to troy ounces the last two digits are 75 or greater, the third decimal place should be rounded up and if the last two digits are 74 or less, the third decimal in the troy ounce weight should remain unchanged.
Weight Tolerance:	For plates/ingots dated 2014 or before, once the troy ounce weight is established either by conversion or stamped on the plate/ingot, subsequent weighing tolerances shall be:
Minus:	0.006 troy ounces
Plus:	no upward limit, the management of this upward limited is to be at the vault manager's discretion.
	For plates/ingots dated 2015 and onwards, once the troy ounce weight is established either by conversion or stamped on the plate/ingot, subsequent weighing tolerances shall be:
Minus:	zero, the plate or ingot must weigh a minimum of the stamped weight
Plus:	no upward limit, the management of this upward limited is to be at the vault manager's discretion.
Appearance:	Smooth, free from cavities and easy to handle.

The Gate-Keepers

It is worth noting that in addition to the above, a Good Delivery bar produced by an accredited refiner only becomes and continues to be London Good Delivery to the extent that the vault manager is willing to accept such a bar.

The vault managers are precious metal experts who manage the vaults approved by the members of LPMCL and who have achieved LBMA Approved Weigher status (certified vaults are listed in the latest GDL Rules). Vault managers are the gate-keepers of the global OTC market and a Good Delivery bar only continues to be London Good Delivery to the extent that the vault manager has confirmed that the bar can be accepted into the London vault and thus into Loco London. Hence, they play a pivotal quality control role in maintaining and sustaining the Good Delivery standards across the market as metal moves in and out of their custody. They also play a quality assurance role in terms of the product invested in by the client whose metal is placed in their custody.

More information is provided in section 7.

Why London Good Delivery is Important

Clearly, it is important for an investor to know that the bar of precious metal they have purchased is exactly what it purports to be – of the correct metal, weight and assay, and so on. However, only bars of the requisite size (as well as the other features listed above) can gain London Good Delivery status.

So whilst a platinum or palladium plate or ingot complying with the weight specifications set by the LPPM, and meeting all the other listed requirements, can be considered to be Good Delivery, the same can never be true of a 1 ounce platinum or palladium bar.

The key feature is that the Good Delivery List underpins the wholesale market. So if an investor is buying precious metals (be they held in allocated or unallocated accounts), the bars underlying those holdings are fungible. In other words, it is irrelevant whether the platinum was mined (and refined) in South Africa, Russia or North America, or indeed any other platinum-producing country, or if the bar was created out of scrap metal, obviously allowing for the fact that the metal meets the standards of Responsible Sourcing Guidance.

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SECTION 7

London Precious Metals Clearing Limited

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London Precious Metals Clearing Limited

LPMCL is at the heart of the Loco London (OTC) system, supporting the most widely traded global market for gold, silver, platinum and palladium. It is a daily clearing system of paper transfers whereby LBMA members offering clearing services utilise the unallocated precious metals accounts they maintain between each other, not only for the settlement of mutual trades, but also for third-party transfers. These transfers are conducted on behalf of clients and other members of the market in settlement of Loco London bullion activities – always remembering of course that if a South African gold mining company were to sell metal to a bank based in Australia, for example, then this sort of trade would almost invariably settle over metal accounts in London and, hence, be a Loco London trade.

The system of utilising the unallocated metal accounts that each clearer maintains with each other minimises the physical movement of precious metals, thus reducing costs and avoiding the security risks involved in the physical movement of precious metals.

The Loco London clearing system is overseen and managed by [LPMCL](#), which is jointly owned and managed by those LBMA members that not only provide a comprehensive clearing service in the London market, but that also have applied for and been granted membership of LPMCL. In 2017, the LBMA assumed responsibility for the administrative functions on behalf of the 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 the 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 precious metals.

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. Crucially, allocated metal is not a credit risk on the institution where

the account is held – it is simply an arrangement for storage. Clearly, institutions will have credit exposure to the clearing member where they maintain their unallocated account. This credit risk can be reduced, to zero if required, by the act of allocation.

Transfer instructions for members' own purposes and for client transfers may be made until 4.00pm London time on the day of settlement, although the earlier in the day that client transfer instructions are communicated to the clearer, the better. LPMCL members then have until 4.30pm to effect transfers or call for allocation for credit purposes between themselves.

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 are applicable for all four widely traded precious metals.

Vaulting

Certain members of the global OTC bullion market offer vaulting services. The updated list can be found on the LBMA's [website](#). They either use their own vaults for the storage of physical bullion or have the use of the storage facilities of a third-party provider. Some third-party vaults will be dedicated to the use of a single bullion clearer, whilst other vaults will be available to a number of bullion clearers and the vault's own customers. It is important that such third-party vault providers are able to meet LPMCL's timing requirements regarding giving/receiving allocations or physical delivery.

The Bank of England primarily offers gold accounts to central bank customers and to certain commercial firms that facilitate, either directly or indirectly, access for central banks to the liquidity of the OTC gold market. Further details can be found on the Bank of England's [website](#). In July 2017 the LBMA published for the first time the amount of gold and silver physically held in London vaults (published three months in arrears). As at end March 2017, there was 7,449 tonnes of gold valued at the time at \$298 billion and 32,078 tonnes of silver valued at \$19 billion.

The vaults of members used in the clearing process will primarily contain London Good Delivery bars, but coins, kilobars and so on may be also be stored in these facilities.

Costs for storage and insurance of bullion are subject to negotiation with each individual member of LPMCL.

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Vault Managers

To reiterate from earlier, a good delivery bar produced by an accredited refiner only becomes and remains London Good Delivery whilst it continues to be accepted by a London vault. Thus the London vault managers act as ‘gatekeepers’ to the Loco London market.

More formally, the vault managers are precious metals experts who manage the vaults approved by the individual members of LPMCL and who have achieved LBMA Approved Weigher status. They are the gatekeepers of the London market and, hence, they play a pivotal quality control role in maintaining and sustaining the Good Delivery standards across the market as metal moves in and out of their custody. They also play a quality assurance role in terms of the product invested in by the client whose metal is placed in their custody.

To ensure the integrity of this key role, the LBMA is in the process of developing the Vault Operators Accreditation Scheme. Until this scheme is finalised, the following provisional standards apply.

Vault Operators Accreditation Scheme

The LBMA has devised a comprehensive set of vault operator competencies in conjunction with participating vaults. In combination with the Good Delivery Rules, these act as a valuable benchmark for the knowledge and skills required of vault operators. The aim of this initiative is to provide an online platform to set out the learning resources and assessment tools to help each LBMA member ensure that their vault operators meet the required standards. To provide a flexible and effective learning and assessment environment, the aim is to integrate the following components:

- Online Managed Learning Environment – to act as the single online portal for vault staff to go through the programme, which will allow managers and external assessors to access and track the vault operator’s progress through the whole learning and assessment experience.
- The ability to upload evidence of operators meeting the competencies.
- E-learning modules to provide learning and guidance to help those undertaking the course acquire core knowledge to underpin their role as vault operators in line with the LBMA’s and the market’s standards.
- Multiple-choice tests designed to check operators’ knowledge on each topic.
- Guidance for managers on the knowledge to be tested and how to help vault operators gain the required knowledge.

Ultrasonic testing of a gold bar



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Weighing Gold

When a gold bar is weighed on a scale, the Dead Weight (A) is truncated (deducted) by 0.002 troy ounces to allow for scale turning (B). The subsequent weight is rounded down to the nearest 0.025 ounces (C) to define the Gross Weight (D). It is the gross weight that is multiplied by the Assay (E) to six decimals, with the final three decimals providing the rounding factor (F) determining whether the resultant weight is rounded up or down to the nearest 0.001 of a troy ounce (G). For example:

A Dead Weight	399.826
B Scale Turning	-0.002
C After Turning Deduction	399.824
D Gross weight	399.800 (Truncated to nearest 0.025 ounce)
E Assay	995.8
F Fine weight (6 decimals)	398.120 840
G Fine Weight	398.120 (The rounding factor of 840 is <900; therefore, round down 0.001 ounces)

If the Dead Weight had simply been multiplied by the assay then, in this case, it would deliver 398.146 fine ounces versus 398.120 fine ounces as per the above. Extrapolating the differential between the two methodologies over a 10,000 ounce trade, it would deliver a cost variance of approximately \$312,000 at \$1,200 per troy ounce.

Weighing Silver

Silver is a little less complex, but there is truncation to the nearest 0.1 ounce and a further rounding factor to take into account to determine the Gross Weight or Gross Troy Ounces (GTO). The key here is that silver is valued and traded at GTO, and the assay is not used in the weight calculation to determine the weight of metal on the metal account.

To reiterate, for gold, the trading unit is one fine troy ounce, but for silver 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, it represents one ounce of material, of which a minimum of 999 parts in every 1000 will be silver.

In essence, these calculations are applied to the weighing process that populates the bar list that is sent to the Bullion Operations Team at the accredited vault, which then credits the FTO (Fine Troy Ounces for gold) and the GTO (Gross Troy Ounces for silver) to the Metal Account. Once the vault has confirmed these weights, a trade can be settled, with the value of the trade determined as a multiple of the weights confirmed by the vault and the price agreed at the point of trade.

Traditional Weighing

Gold bars have been traditionally 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 must move 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 – the equivalent of a human hair.

For silver, the traditional methodology is a little different in that the bar weight is expressed in multiples of 0.1 of an ounce (which is the smallest weight used for a beam balance which is recognised as appropriate for weighing silver). Note that these scales are not as sensitive as those used for gold and other high-value metals, which for the purposes of this Guide means platinum and palladium.

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 must move 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.

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Weighing Platinum and Palladium

The rules regarding platinum and palladium are slightly different and are reproduced below from the LPPM [website](#).

The principle applied to the weighing of LPPM Good Delivery platinum and palladium plates or ingots is that the weight stamped on a plate or ingot should be the minimum weight. The producer/refiner should expect to be credited with the stamped weight, and any subsequent physical movement of such plate or ingot out of the clearing system should also reflect the stamped weight on the relevant weight list. The LPPM however accepts that there can be minor differences in weighing equipment, and for practical and clarity purposes has set out the following rules:

- Weight Stamping:** The weight in grams, kilograms or troy ounces (if in grams to one decimal place, if in kilograms to four decimal places and if in troy ounces to three decimal places).
- Rounding:** Weight lists shall be produced in troy ounces or converted from kilograms using a standard conversion rate from kilograms to troy ounces of 32.1507465 to produce a five-decimal figure. If upon conversion to troy ounces the last two digits are 75 or greater, the third decimal place should be rounded up and if the last two digits are 74 or less, the third decimal in the troy ounce weight should remain unchanged.
- Weight Tolerance:** For plates/ingots dated 2014 or before, once the troy ounce weight is established either by conversion or stamped on the plate/ingot, subsequent weighing tolerances shall be:
- Minus:** 0.006 troy ounces
- Plus:** no upward limit, the management of this upward limited is to be at the vault manager's discretion.
- For plates/ingots dated 2015 and onwards, once the troy ounce weight is established either by conversion or stamped on the plate/ingot, subsequent weighing tolerances shall be:
- Minus:** zero, the plate or ingot must weigh a minimum of the stamped weight
- Plus:** no upward limit, the management of this upward limited is to be at the vault manager's discretion.

Scales

While electronic scales have been existence and in widespread use for many years, traditionally, they have not been considered accurate enough for use within precious metal vaults given the precise measurements required. However, in 2010, it was determined that the technology had improved to the extent that electronic sales were considered to be as accurate as the Victorian engineering that underpins the beam balance scales.

Hence, in London's precious metal vaults, the electronic scales are now deemed the primary weighing methodology – particularly given the rapid results achieved. While there are no specific rules regarding which scales may be used, it is market practice to use Sartorius Gold Bullion Scale Model GBB 14202S-OCE electronic scales for gold, platinum and palladium. Given the lower value of silver, the scales used for this metal are not required to be as accurate. However, for all four metals, if there are any areas of dispute, the traditional beam balance scales are utilised.

It is worth emphasising that the requirements for accuracy are so demanding that even drafts from fans or air conditioning could affect the results from the scales and, hence, these are not used in areas where precious metals are weighed.



The traditional beam balance scales used to weigh gold bars



Sartorius electronic scales. This Sartorius balance, designed and produced in Germany is widely used to weigh gold bars in accordance with Good Delivery Rules of the LBMA

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SECTION 8

Precious Metal Accounts

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Precious Metal Accounts

The Metal not the Account

Clearly, gold, silver, platinum and palladium are all traded metals. It is an important distinction that it is not unallocated or allocated metal that is traded, but the metal itself. The allocated and unallocated terminology simply reflects the type of account over which the metal clears post trading.

Unallocated Accounts

Probably in excess of 90% of all precious metals traded on the interbank/wholesale/OTC market clear over unallocated Loco London accounts. Ultimately, this reflects a debit or credit over an account, and the account holder has a claim on the general pool of metal held by its clearer – rather than a specific bar. Therefore, a credit balance on an account means that the owner of the metal has credit exposure to the institution where the account is held. In this respect, it is analogous to a current/checking account held with a bank for a currency.

The advantage of settling precious metals over unallocated accounts is that it is quick, simple and a specific quantity of metal can be bought (or sold). For example, if an investor wishes to purchase \$1,000,000 worth of gold then this number could simply be divided by the spot price and the relevant amount of metal, calculated to three decimal places, could be credited to the unallocated account on the spot date with the US dollars also being paid on that day.

For investors that are used to transacting in the global foreign exchange market, this type of transaction is very familiar.

Allocated Accounts

Unlike unallocated accounts, an allocated account is backed by a specific bar of the precious metal. So that the investor would not see a simple credit on their account but instead 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 physical movements of bars, plates or ingots to or from the client's physical holding. An allocated account cannot, by definition, be overdrawn.

In this instance, the investor does not have a credit exposure to the institution where the account is maintained and, in the event that the

account operator is declared in default, then theoretically the creditor could simply drive to the vault and remove their bars physically – in practice this would be rather more complicated given that these facilities are very high security environments that do not welcome visitors. In this respect, it is analogous to a safe deposit box with the account operator simply acting as custodian.

When discussing the difference between these two types of account and particularly their credit profile, a common question is “why would anyone ever trade unallocated metal given the very different credit profile of each?” The answer is equally straightforward. Convenience.



Silver bars

For example, an investor looking to get exposure to precious metals would have to buy gold in approximate multiples of 400 ounces, silver in multiples of 1,000 ounces, and platinum and palladium 1-6 kilograms – these being the sizes of the Good Delivery bars which would exclusively be held in such facilities. A further complication is that a standard ‘400 ounce gold bar’ can weigh between 350 and 430 ounces, and will have a minimum purity of 995 (so called ‘two nines five’) or 99.5%.

So even if the seller manages to source a bar weighing exactly the 400 ounces that the investor required, they would be charged for the gross weight multiplied by the purity. For example, $400 \times 0.995 = 398$ ounces.

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Please see section 7 for more information regarding the weighing of bars.

Ultimately, any requirement to trade allocated metal is likely to be a two-stage process. The investor would initially purchase a quantity approximately divisible by 400 ounces, in the case of gold. This would then need to be adjusted later in the trading day to the specific quantity of gold contained in the allocated bars. Clearly, this can be both over and under the requested quantity – although most vault operators will endeavour to get as close to the required amount as possible.

For example, an investor wants to buy 10,000 ounces of gold and is actually allocated 9,993.213 ounces of fine gold. The investor would then need to sell 6.787 ounces (being 10,000 – 9,993.213) back to the market maker from which the gold had originally been purchased and at the prevailing market price. Alternatively, if the respective numbers were 10,000 and 10,012.345 then the investor would need to buy the additional 12.345 ounces. Clearly, this is possible for occasional trades, but if an institution is transacting hundreds of precious metal trades a day, it is not feasible both in terms of dedicating specific bars for each transaction as well as the myriad of small balancing trades required. However, as per the below, it is possible to switch account balances from unallocated to allocated and vice versa.

Unallocated versus Allocated

It is worth noting that if an investor purchases metal and places it in an unallocated account then this amount can be switched to an allocated account, or vice versa – should conditions/requirements change.

Generally, members of London Precious Metals Clearing Limited (LPMCL) would look to achieve this switch no later than on the spot date and, in most instances, on the day that the instruction is received. However, this can vary depending on market circumstances. Whether or not there is a charge for this service will once more depend on the individual clearer.

Charges

Investors will have to pay a maintenance fee for their unallocated account or a storage fee for their allocated account. Charges will vary between account operators.

Traditionally, a fee was levied on the basis of the number of bars held, with

no reference to the underlying price of the metal. However, more recently, charges have tended to be calculated as a certain number of basis points on the value of metal in the account. This is assessed daily and charged quarterly in arrears.

For example, if the levy was 25 basis points on an account containing 10,000 ounces of gold, where the spot price of the metal was \$1200 per ounce, then the charge for that particular day would be:

$$((10,000 \times \$1200 \times 0.25\%)/360) \times 1 = \$83.33$$

Given the lower value of silver compared to the other precious metals, the storage costs tend to be commensurately greater, while platinum and palladium storage fees tend to be higher than those for gold, but lower than those for silver. Fees will vary between clearers and as to whether the metal stored is in London or Zurich.

As has been mentioned earlier in this Guide, London is the dominant clearing centre for gold and silver, but the picture is more nuanced for platinum and palladium, with Zurich still playing an important role.

However, it is worth highlighting some important differences between the two centres. London has more clearing members and the Aurum electronic matching system operated by LPMCL is at its heart. Crucially, LPMCL provides the rules and structure to create an orderly market to settle Loco London transactions, all covered by Her Majesty's Revenue & Customs Terminal Market Order (HMRC TMO). HMRC considers Full Members of the LBMA as official members of the market that can therefore trade under the terms of the TMO (please refer to section 17 for further details).

In London, switching between unallocated and allocated account, as noted above, is generally easy and flexible. However, in Zurich there are fewer clearers, no matching system and Swiss VAT rules make allocations more challenging outside of bonded warehouses.

Insurance

The owner of allocated metal is, in the absence of express contrary agreement with the institution where the allocated account is maintained, responsible for arranging their own insurance.

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Lending and Borrowing Metal

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Lending and Borrowing Metal

It is often blithely asserted that precious metals have no interest rate. This is incorrect.

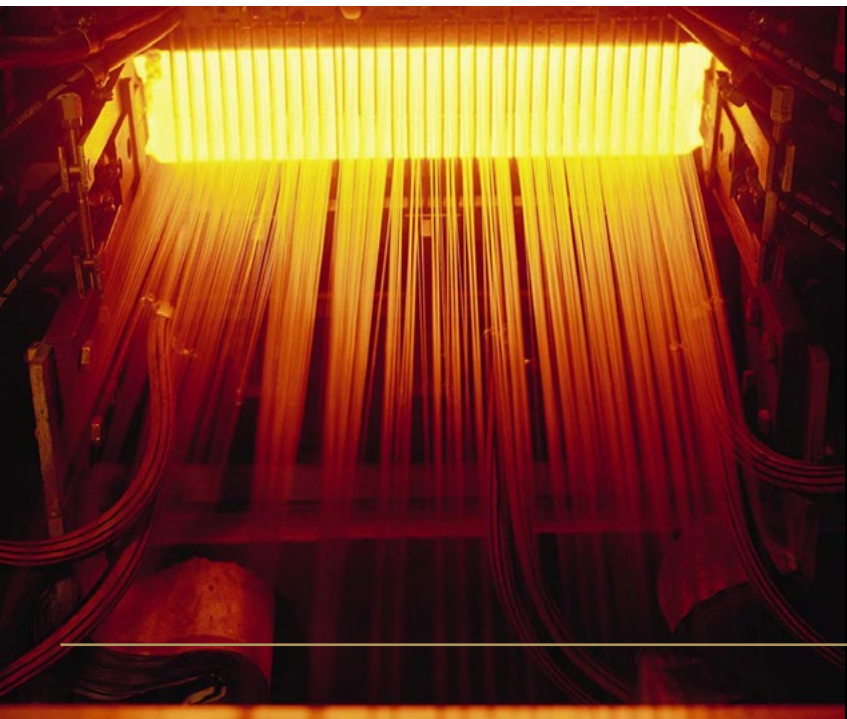
Deposits and Leases

The rationale for lending and, particularly, borrowing metal will vary between gold, silver, platinum and palladium. However, very broadly speaking, lenders of metals will be seeking a return on their investment, whereas the borrowers will have a variety of motives. These can range from miners seeking to hedge future output to industrial companies borrowing platinum and palladium that will be turned into catalytic converters before being installed in a petrochemical plant.

Clearly, the range of motivations is far wider than those listed above, but the calculation on deposits and leases remains the same.

For example, a fibreglass manufacturer wants to borrow 2,000 ounces of platinum for a year to use the metal in the industrial process. For illustrative purposes, if it is charged an interest rate of 4% and the day count is exactly 365, then the calculation for the interest owing at maturity is simply:

$$((2000 \times 4\%)/360) \times 365 = 81.111 \text{ ounces}$$



At maturity, the loan can be rolled over (depending on credit considerations), either with the existing lender or with another bank. The lender has full credit exposure to the borrower over the amount of the loan – the currency value of which will fluctuate as the underlying metal price increases or decreases.

However, it is unlikely that the fibreglass manufacturer will have ready access to additional platinum (save by buying it) to repay the interest and may not be willing to accept the unquantifiable risk in being effectively short platinum for a year. Therefore, the loan is likely to be converted from one where interest is payable in metal to one where it is payable in currency – on the basis that a manufacturer is more likely to have access to currency than metal – at the spot price at inception.

Using the same numbers and example, a fibreglass manufacturer wants to borrow 2,000 ounces of platinum for a year to use the metal in the industrial process. For illustrative purposes, if it is charged an interest rate of 4%, the platinum price is \$1000 per ounce and the day count is exactly 365, then the calculation for the interest owing at maturity is simply:

$$((2000 \times \$1000 \times 4\%)/360) \times 365 = \$81111.11$$

At maturity, the loan can be rolled over (depending on credit considerations), either with the existing lender or with another bank. The lender has full credit exposure to the borrower over the amount of the loan – the currency value of which will fluctuate as the underlying metal price increases or decreases. However, the manufacturer has certainty over the amount of interest owing at maturity – obviously, this could equally be priced in euros and so on.

Calculation Basis

The day count convention used in the above example calculation is known as actual/360 (actual over 360) – the total number of days for the loan divided by the theoretical length of a ‘year’. This applies for the metals whenever interest is to be paid in metal or in a currency and where the convention is for a 360-day year.

However, where interest is to be paid in a currency where there is a 365-day convention – in GBP (pounds sterling), AUD (Australian dollars) and ZAR (South African rand), for example – then the calculation becomes actual/365 (actual over 365).

Manufacture of fibreglass

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It is perhaps worth noting that a leap year would not result in the theoretical length of a year increasing to 361 or 366 days (from the 360 and 365 date conventions mentioned above, respectively).

Interest Paid in Currency or Metal

In a low interest rate environment, there is generally no difference in the rate as to whether the ultimate interest is to be paid in currency (US dollars as in the example above) or in the metal itself.

Indeed, it is unlikely that a fibreglass manufacturer would have the ability to pay 81.111 ounces of platinum in interest – it would also expose it to price movements in the value of platinum, which may well be undesirable from its point of view. Therefore, and as illustrated above, it is much simpler for the lender to translate the loan into USD equivalent and for the borrower to settle the interest charge in USD (or JPY, EUR, etc.). However, it is generally true that the principal – the 2,000 ounces in the example – will be repaid in metal.

The rationale, and impact on the rate levied, for whether interest is repayable in currency or commodity is dealt with later in this section.

Lending Allocated Metal

The simple answer is that it's not possible to lend allocated metal. Allocated metal is associated with specific bars in an account and, clearly, it is not possible to lend specific bars and expect to get the same ones back while receiving a return – in the same way that no one would be interested in a currency loan in which the requirement was to hand back the same banknotes as were originally lent.

Therefore, allocated metal becomes unallocated when it is lent but can be returned as allocated. Albeit, it will be returned with different bars and will likely be of a (slightly) different weight.

The single grouping with the greatest concentration of allocated metal is the world's central banks and the stocks of gold that they hold. Some of this stock will be held domestically, some may be held in the Federal Reserve in New York, while a major proportion is likely to be held in the vaults of the Bank of England in London. Indeed, its vaults held in excess of 163 million ounces of gold, equivalent to some 5,080 tonnes, as of March 2017. For the latest data, please see the Bank of England's [website](#). It should be noted that all gold held in the Bank of England is allocated – no metal other than gold is held at the Bank.



One of the Bank of England gold vaults

The role of the Bank of England in the market is dealt with at greater length in section 12. However, one of the primary functions of the Bank is as a custodian for the UK Government, central banks and certain commercial firms. To reiterate from section 7, the Bank of England primarily offers gold accounts to central bank customers and to certain commercial firms that facilitate, either directly or indirectly, access for central banks to the liquidity of the London gold market.

As of July 2017, it has been calculated by the World Gold Council (using data from the International Monetary Fund's International Financial Statistics) that the world's central banks hold 33,399.2 tonnes of gold. A listing appears in section 22. The most recent version of this data can be found on the World Gold Council's [website](#).

If a central bank wishes to lend its gold, it will source a deposit rate from a commercial bank and agree to lend the metal assuming the rate is acceptable. Implicit in this dialogue is that the central bank understands that it will not be returned the same gold bars that it lent out and that while it previously had no credit risk, with the metal having been held allocated at the Bank of England, it now has an exposure in the full amount of the deposit to the bank to which it lent the metal.

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The earlier example of platinum and the fibreglass manufacturer is replicated for the calculation for a central bank lending gold to a commercial bank with the interest payable in metal – although this need not be the case and a central bank could equally request interest to be accrued in a currency of its choosing and specified at the outset of the transaction.

Assuming that the amount being lent is approximately 2 tonnes of allocated gold from the central bank's account at the Bank of England for six months, with the interest to be paid in gold, then the calculation is:

$$((64,123.432 \times 0.5\%)/360) \times 183 = 162.980$$

Therefore, the commercial bank will be looking to return principal of 64,123.432 ounces of gold plus the interest of 162.980 ounces – a total of 64,286.412 troy ounces.

However, while the borrowing bank will attempt (via its clearer) to get as close as possible to this amount, it is not always possible to return the precise amount in terms of bars (containing approximately 400 ounces of fine gold), as well as to three decimal places. Therefore, there are a number of ways in which this can be resolved – generally, this will take place two business days prior to the deposit maturing.

The central bank will request an 'overweight'. If the commercial bank cannot return the exact amount then the central bank would prefer to get bars of gold as close as possible to but in excess of 64,286.412 ounces. The additional gold being bought by the central bank from the commercial bank and often basis the benchmark LBMA Gold Price auction.

Alternatively, the central bank requests an 'underweight'. If the commercial bank cannot return the exact amount then the central bank would prefer to get bars of gold as close as possible to but less than 64,286.412 ounces. The shortfall in gold being sold by the central bank to the commercial bank and often basis the benchmark LBMA Gold Price auction.

The central bank requests an overweight or an underweight but does not have the authority to buy or sell metal. If the commercial bank cannot return the exact amount then this conundrum will be resolved by utilising a 'side account' of unallocated gold that can either have a positive or negative balance on it. Hence, the total repaid to the allocated and unallocated accounts will be a net of 64,286.412 ounces of gold.

Forwards

Clearly, the types of transactions in the previous section all have full principal credit risk – plus any accrued interest – on the borrower from the lender. Given the strains that full principal-to-principal exposure would put on balance sheets and risk limits, there are a number of structures that have grown up to mitigate this.

The most obvious are where there is an exchange of metal and currency – so called forwards, swaps, repos (repurchases) and so on. Given that these are considerably more efficient in maximising effective use of risk limits, these tend to be the structures that are used for day-to-day trading, notwithstanding the examples given earlier in this section.

For leases and deposits, there is only one underlying that is lent or borrowed and, hence, only one interest rate. In the following examples, there are two underlyings, metal and currency, and therefore two interest rates are involved. This is a familiar scenario to traders of foreign exchange, base metals and so on. However, in those markets, the 'points' (to adjust the spot price to a forward price) are quoted. Therefore, if the base price is 100, for example, and the 'points' are a premium of 2, then the forward price is 102.

However, the precious metal markets do not quote in this manner. Instead, the forward price is quoted as the net of the currency interest rate and the metal interest rate. For example, if a theoretical USD one-year interest rate was 10% for borrowing USD and 3% for lending gold then the gold swap rate would be 10% - 3% = 7% for one year. Clearly, these rates are enormously out of line with the current market low-rate environment, but in the interests of illustrative clarity, extreme off-market rates are being used in the examples.

In this instance, a one-year gold swap could be quoted as 7% to 8%. If a counterpart traded at 7% then the quoting bank would 'sell and buy gold' (or 'lend'). On the other hand, if the institution requesting the quote traded at 8% then the bank making the price would 'buy and sell' gold (or 'borrow'). The principal is the same across all four precious metals. Obviously, the day count conventions continue to apply.

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In the first instance, the quoting bank trades gold at 7% where it sells and buys (lends) the metal:

Bank sells to its client 100,000 ounces of gold at **\$1200.00** value spot

Bank buys from its client 100,000 ounces of gold at **\$1285.167** value spot plus 365 days

The calculation for the price for one year forward is:

$$(\$1200 + ((\$1200 \times 7\%)/360) \times 365) = \$1200.00 + \$85.167 \\ = \$1285.167$$

The convention is that the number of decimal places for the forward price is one more than in a normal spot price. So that while gold, platinum and palladium prices are quoted to two decimal places (cents in other words) in the spot market, the forward prices are adjusted to three decimal places. For silver, however, the spot quoting convention is to four decimal places (to the quarter of a cent per ounce) and, hence, the forward price is adjusted to five decimal places.

In the second instance, the quoting bank trades gold at 8% where it buys and sells (borrows) the metal:

Bank buys from its client 100,000 ounces of gold at **\$1,200** per troy ounce value spot

Bank sells to its client 100,000 ounces of gold at **\$1297.333** per troy ounce value spot plus 365 days

The calculation for the price for one year forward is:

$$(\$1200 + ((\$1200 \times 8\%)/360) \times 365) = \$1200 + \$97.333 \\ = \$1297.333$$

Outright Forwards

In the previous example, the institutions were borrowing or lending metal, either because of business requirements or because they believe that metal interest rates would rise or fall and wished to transact their market view.

However, in the simplest case of a mining company wishing to sell gold today that will not be mined for another year then the calculation will be

one-sided – an ‘outright forward’. For example, the miner will sell gold spot at \$1,200 per troy ounce and then request for it to be ‘rolled’ for one year, with the day count 365. So the calculation, as above, is:

$$(\$1200 + ((\$1200 \times 7\%)/360) \times 365) = \$1200 + \$85.167 \\ = \$1285.167$$



The ore stockpile at AngloGold Ashanti's Cerro Vanguardia operation in Argentina

The volatile spot market tends to change rapidly, whereas the forward interest rate is likely to stay the same during the time that the transaction is being quoted. Hence, market convention is generally for the spot price to be quoted and then rolled, rather than an outright forward price to be requested – although the swap/forward interest rate will normally be agreed in advance of the transaction.

Although most of the examples that have been given are for gold, these conventions apply across all four metals.

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Forward Forwards

These are swaps that start on a future date – rather than spot – and can be for any period. For example, a ‘3s 9s’ or ‘3 x 9’ would be for a six-month swap starting in three months’ time and maturing in nine months.

However, it is worth noting that the front price, i.e. the basis price for the swap, would not be the spot price but instead the three-month outright forward price – as calculated in the section above.

For good order’s sake, it is worth mentioning that a six-month swap starting in three months is likely to be a different rate from a six-month swap out of spot.

Short Dated 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:

- Overnight:** From today till the next business day and generally only used in extremis.
- Tom-next:** Short hand for ‘tomorrow to the next business day’. In other words, 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 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, customers should not depend on being able to borrow metal on an ‘overnight’ (today until the next business day) basis.

Transaction Dates

Delivery of currency and metal is effected on the so-called ‘spot date’ for the first leg of the swap/forward transaction. Excluding public holidays, it means that a trade entered into on a Monday will settle on a Wednesday and a trade entered into on a Friday will not settle until the following Tuesday. Forward transactions will be quoted, unless specified to the contrary, from the spot date to the requested date.

As raised in section 4, while there must be two good London business days between trade date and spot, if a US holiday falls between the trade date and what would otherwise be the good spot date from the London holiday schedule, the US holiday is generally ignored. It is worth noting though that metal will not settle on US holidays.

Sometimes it can be the case that certain institutions will prefer to have two clear business days in each of London and New York to ensure that there is sufficient time for both currency and metal to settle. Therefore, it is worth clarifying with the quoting institution to ensure that any possibility of confusion is minimised.

The forward date of the transaction will need to be a good business day in London and New York. If it is not then it will be rolled forward to the next business day in both centres. Unless this means that the settlement date would fall into a new month. In which case the ‘End End convention’ applies.

‘End End’ Convention

Value dates for standard forward quotations are at calendar monthly intervals from spot. This means that if on 1 January, 3 January is the spot date, then the one-month date will be 3 February. Should that day be a non-business day (in either the metal or currency clearing centre), the value will be for the next good business day in both centres so that the date moves forward.

This is invariably the case except at month end, when the value date will be kept in the same 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.

If dealing spot for value 28 February (in a non leap year) and transacting a one-month trade then the maturity date should be 31 March. However, it may be sensible to clarify this is the case to avoid any confusion.

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Market Size

In the forward market, subject to credit limits, London's 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.

Contango or Backwardation

Gold is almost invariably a 'contango' market. Silver is generally a contango, and platinum and palladium vary between contango and backwardation.

In the examples above, the currency interest rate was above that of the gold interest rate. Hence, the swap figure – the net of the currency and metal interest rates – was positive. In turn, this means that the forward price is greater than the spot price, which is the definition of a contango market.

Clearly, then, a backwardation is the opposite – where the forward price is below the spot price. The calculations are exactly the same with the swap rate as the net of the currency and metal interest rates.

To partly rework the gold example used earlier in this section for PGMs, if a theoretical USD one-year interest rate was 10% for borrowing USD and 14% for lending platinum, then the platinum swap rate would be 10% - 14% = -4% for one year. Clearly, these rates are enormously out of line with the current market low-rate environment, but in the interests of clarity, extreme off-market rates are once more being used.

In this instance, a one-year platinum swap could be quoted as -4% to -3% (so the lower number is always quoted first). If a counterpart traded at -4% then the quoting bank would sell and buy platinum – in other words, lend metal. On the other hand, if the institution requesting the quote traded at -3% then the bank making the price would buy and sell platinum – in other words, borrow metal.

In the first instance, the quoting bank lends platinum at -4% where it sells and buys the metal:

Bank sells to its client 10,000 ounces of platinum at **\$1000** per troy ounce value spot

Bank buys from its client 10,000 ounces of platinum at **\$959.444** per troy ounce value spot plus 365 days

The calculation for the price for one-year forward is:

$$(\$1000 + ((\$1000 \times -4\%)/360) \times 365) = \$1000 + -\$40.556 = \$959.444$$

In the second instance, the quoting bank borrows platinum at -3% where it buys and sells the metal:

Bank buys from its client 10,000 ounces of platinum at **\$1000** per troy ounce value spot

Bank sells to its client 10,000 ounces of platinum at **\$969.583** per troy ounce value spot plus 365 days

The calculation for the price for one-year forward is:

$$(\$1000 + ((\$1000 \times -3\%)/360) \times 365) = \$1000 + -\$30.417 = \$969.583$$

What Determines Metal Interest Rates

Interest rates for currencies are generally determined by a combination of the actions of the relevant monetary authorities plus the transactions of key players in the global financial markets.

For precious metals, the scenario is somewhat different in that there are no monetary authorities that seek to set, or even influence, interest rates for precious metals. Hence, supply and demand tend to be the overwhelming defining factors. For gold, the perception is that there are sufficient above-ground stocks (mainly those owned by central banks) to prevent metal rates spiking above those for the US dollar and so gold is almost inevitably in contango.

The PGMs (platinum and palladium are, as throughout this Guide, the PGMs referred to) are primarily industrial metals. There are very few above-ground stocks and, hence, there can be a premium required for immediate delivery – if needed to create catalytic converters for the auto industry, for example. Therefore, depending on market circumstances, it is not unusual for platinum and palladium to trade in a backwardation.

Silver, being a form of hybrid in having industrial uses as well as being a widely desired investment, generally spends more time than gold in backwardation but less time than platinum and palladium.

Given the predominance of swaps being traded, rather than deposits or leases, due to their more advantageous credit treatment, it is these transactions that will determine the overall level of metal interest rates.

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Receiving Interest on a Deposit

Earlier in this section, it was mentioned that in a low interest rate environment, there would be little, if any, difference on whether interest is paid in metal or in currency. However, this is not the case in an environment where interest rates are high for currencies but low for metals – in other words, when there is a large contango (greater premium for forward rather than spot sales).

For example:

Central Bank lends Commercial Bank 100,000 ounces of gold at 0.50% for 12 months.

The interest earned in gold would be:

$$((100,000 \times 0.5\%)/360) \times 365 = 506.944 \text{ ounces}$$

If this was monetised at the spot price of **\$1200** for example, then the central bank would receive **\$1200** x 506.944 = **\$608332.80** in interest at maturity.

However, by the same token, the central bank would know that in 12 months' time it would be receiving 506.944 ounces of gold as interest. Therefore, instead it could elect to sell that gold on an outright forward basis. Continuing to assume rates that are enormously out of line with the current market environment for purely illustrative purposes, then if the 12-month rate for USD deposits is 10%, this would give a theoretical swap rate of 9.5% (10% minus the cost of borrowing gold, which is 0.5% in this example). Thus, the central bank could sell the 506.944 ounces of gold at:

$$(\$1200 + ((\$1200 \times 9.5\%)/360) \times 365) = \$1200 + \$115.583 = \$1315.583$$

This would then equate to **506.944 x \$1315.583 = \$666926.91** in interest – an increase of **\$58594.11** (being **\$666926.91** minus **\$608332.80**) for an identical trade except for the basis on which the interest earned would be paid. Hence, deposit and lease rates will differ in more extreme rate environments depending on whether interest is to be paid in metal or currency.

Options

Due to the relative paucity of data, there are no options on precious metal interest rates themselves.

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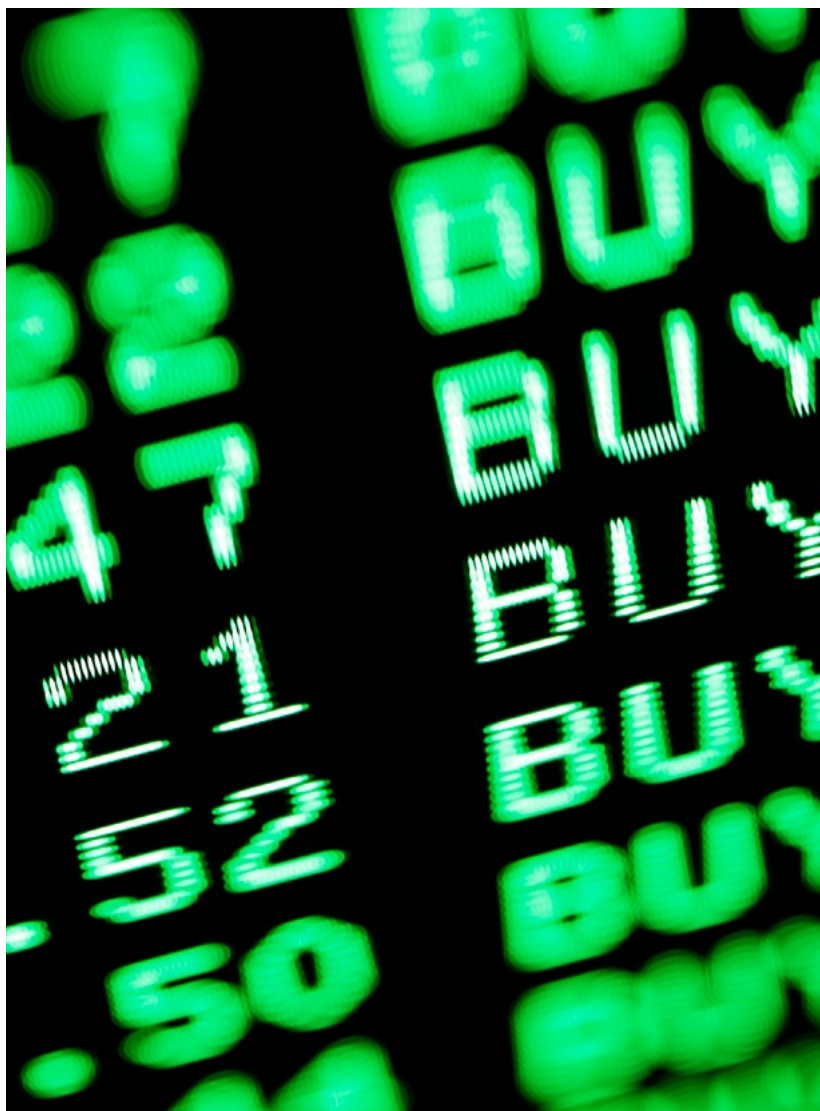
It is not the purpose of this Guide to teach option theory and trading, but simply to explain the workings of the precious metals markets. Therefore, there are no definitions of puts, calls, Asians, Americans, barriers, path dependant options and so on.

However, it is worth noting that the majority of the option products that are available in the foreign exchange markets can be quoted in the precious metals markets as well. Gold, silver, platinum and palladium options are normally expressed, as in other markets, in terms of volatility in discussions between market makers. If a customer has a preference, this can instead be quoted in terms of USD per ounce – or, indeed, in whatever currency the strike price is set in. The standard, if not specified, will be for a European option.

Precious metals options are normally quoted with a ‘New York’ cut – in other words, they expire at 9.30am New York time (note that this is not always the same as 2.30pm London time). However, traders in Asia may prefer a time during their normal business day, in which case a ‘Tokyo’ cut may be used. These expire at 3pm Tokyo time. The standard expiry date for interbank options is two business days, in London and New York, prior to the end of the month for USD denominated Loco London options – in other words, when the spot date is the final day of the month. Clearly, customers can express other days as their preference, given that this is an OTC market, as well as the currency that the metal option is quoted against.

‘Cash-settled’ options are those where the investor does not wish to take, or make, delivery of precious metals, in which case, at expiry, the option is immediately closed out against the spot market. In the majority of cases, it is preferable to do this against a benchmark – in other words, the various LBMA precious metal official benchmarks/auctions, which will not generally be at the same time that the regular options themselves expire. Hence, it should be clarified prior to trading whether the option is intended to be cash settled at maturity.

Due to the relative paucity of data, there are no options on precious metal interest rates.

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SECTION 11

Precious Metal Benchmarks

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Precious Metal Benchmarks

LBMA Prices

The LBMA Gold, Silver, Platinum and Palladium price auctions are recognised as the international global benchmarks for precious metals as defined in documentation for the International Swap Dealers Association (ISDA).

For example, in ISDA's Commodity Definitions, "GOLD-LBMA PRICE-AM" means that the price for a Pricing Date will be that day's morning London Gold Price per troy ounce of gold for delivery in London through a member of the LBMA authorised to effect such a delivery. The price will be stated in US dollars, as calculated and administered by independent service provider(s), pursuant to an agreement with the LBMA, and published by the LBMA on its [website](#) that displays prices effective on that Pricing Date."

Similar conventions apply throughout the ISDA Commodity Definitions for silver, platinum and palladium.

The guiding principle behind the auctions is that all business, whether for large or small amounts, is conducted solely on the basis of a single published price. Clients around the world wishing to buy or sell precious metals may all do so at this price. 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 forward and option transactions, and are fully IOSCO compliant. Orders executed at the auctions are currently conducted as principal-to-principal transactions between the client and the dealer through whom the order is placed. In April 2017, clearing was introduced for the LBMA Gold Price to allow for greater participation.

It is important to restate that the price of all four precious metal benchmarks are set when transactions between buyers and sellers are matched within a certain defined and published tolerance. This is true both currently and historically.



The winning design, from the Royal Mint, in the LBMA's Medallion competition to commemorate the LBMA's silver anniversary

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History

The first official global precious metal benchmark was adopted for silver in 1897 and for gold in 1919. The London Platinum Quotation was introduced in 1973 (a forerunner of the fixings) and was a twice-daily indication of the market price for spot platinum, reported by some of the principal companies dealing in the metal. The London Palladium Quotation was introduced subsequently. In 1989, the London Platinum and Palladium Quotations were expanded and upgraded to full fixings.

These benchmarks were generically known as the ‘fixings’ for gold, silver, platinum and palladium, but now are known as the LBMA metal prices for each of these four metals.

This change started in May 2014, when the LBMA was tasked with the ultimate responsibility for ensuring that there was no market disruption after the Silver Fixing Company announced that it would wind down its administration of the ‘Silver Fix’ on 14 August 2014. The LBMA worked closely with the market, the Silver Fixing Company Limited, as well as the relevant regulators updating them on the progress of the launch of the new LBMA Silver Price. Following that successful launch, the London Platinum and Palladium Fixing Company also announced its intention to relinquish its role and move the administration over to an independent third party. The LBMA worked closely with the newly appointed independent administrator and successfully launched the LBMA Platinum and Palladium Prices on 1 December 2014. The LBMA went through the same process for gold as it did for silver, with the revised Gold Price auction launched on 20 March 2015. Ultimately, all the former “fixings” for the precious metal spot price benchmarks have been transferred to independent third-party administrators.

LBMA Gold Price

The LBMA Gold Price is set twice daily (at 10.30am and 3pm London time) in US dollars per fine troy ounce of 995 gold. The price formation for the gold auction is in US dollars, with the final price is converted into the benchmark in multiple currencies, including Australian dollars, British pounds, Canadian dollars, euros, onshore and offshore yuan, Indian rupees, Japanese yen, Singapore dollars, South African rand and Swiss francs. The benchmark is available both in prices per ounce and in prices per gram.

A set of Frequently Asked Questions can also be found on the LBMA’s [website](#).

LBMA Silver Price

On 15 August 2014, the historic Silver Fixing, which had been in existence since 1897, was replaced by the LBMA Silver Price.

The price continues to be set each business day at 12:00 (London time) in US dollars per 999 (three nines) fine ounce.

A set of Frequently Asked Questions can also be found on the LBMA’s [website](#).

LBMA Platinum and Palladium Prices

The LBMA Platinum and Palladium Prices are independently administered. The prices are set twice daily at 09:45 and 14:00 (London time) in US dollars per 999.5 (three nines five) fine ounce. Sterling and euro prices are available, but these are indicative prices for settlement only. Further details can be found on the LBMA’s [website](#).

Intellectual Property

The intellectual property for all four global precious metal benchmarks is held by Precious Metals Prices Limited, which is a subsidiary company of the LBMA and was incorporated at Companies House on 1 December 2014.

The LBMA auction prices for gold, silver, platinum and palladium are published following setting by the various data vendors such as Bloomberg, Thomson Reuters, etc. They are also available on the LBMA website but with a time delay.

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SECTION 12

Bank of England

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An Ongoing Role



Bank of England

Background

The Bank of England has been the focal point of gold trading in London for much of the last three hundred years and traces its involvement back to the earliest days of the London market.

The Bank was founded in 1694. In 1697, the first gold rush brought metal from Brazil into London, partly transported on ships owned by the East India Company, which had been granted a Royal Charter from Queen Elizabeth I on 31 December 1600. This inflow of gold led to demand for a purpose-built London vault, which the Bank of England duly set up. Its ‘bullion warehouse’ served the whole of the European market and was further stocked by the influx of gold into London from the subsequent gold rushes in California, Australia and South Africa. For a significant portion of that time, the majority of imports of gold and silver into Britain were sent for delivery to the Bank of England’s Bullion Office.

The refineries that were set up to process this gold were located close to the Bank of England (which owned the St Luke’s refinery). This played a key role in it being a custodian, regulator and facilitator of lending and selling of gold by other banks.

In 1750, the Bank set up the London Good Delivery List, which formally recognised those refineries which produced gold bars of a certain standard and could therefore be allowed to enter the London market. Today, this list is regarded as the only globally accepted accreditation for the bullion market, ensuring that the wholesale bullion bars traded in the market meet the standards and quality required by Good Delivery.

Only after the great expansion of the bullion business following the Californian and Australian gold rushes in the 1850s was the Bullion Office bypassed by brokers in the London market, weighing and storing gold independently. The Bank also had responsibility throughout the period that Britain was on the gold standard of buying gold and sending it to the Mint for coinage – the Bank was bound to redeem the notes that it issued in gold coin. When the gold standard was suspended in 1914, the Bank continued to take much gold, including all South African production, for Britain’s reserves.

The Bank of England, the ‘Old Lady’ of Threadneedle Street

After the establishment of the daily ‘Gold Fixing’ in London in 1919, the Bank soon became the agent for the South African Reserve Bank for marketing its gold at the fix – a task it continued until March 1968. After this, its pivotal role diminished with the establishment of the free market.

By the 1980s, the development of the market was such that the Bank of England recognised that the custody, maintenance and regulation of the Good Delivery List required an independent body. This was the catalyst for the founding of the London Bullion Market Association in 1987.

Custodian

The Bank of England is one of the largest gold custodians in the world. The most up-to-date information can be seen on the Bank’s [website](#).

The Bank provides safe custody for the United Kingdom’s gold reserves (owned by Her Majesty’s Treasury) and for other central banks. This supports financial stability by providing central banks with access to the liquidity of the London gold market. It also provides gold accounts to certain commercial firms (including members of the LBMA) that facilitate access for central banks to the global OTC gold market.

The gold that the Bank holds on behalf of its customers does not appear on its balance sheet. This is because the Bank provides gold storage on an allocated basis, meaning that the customer retains the title to specific gold bars in its vaults, rather than a claim on the Bank for a certain weight of gold.



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The UK Government is a customer of the Bank of England. The Bank itself only owns two London Good Delivery bars, both of which are on display in the Bank’s museum. The Bank holds a small foreign exchange reserve, but the gold reserves of the United Kingdom are the property of HM Treasury. The Bank of England manages this reserve on its behalf.

Regulator

In common with a number of other financial markets, the Bank of England was historically the regulator of the London bullion market. However, the Bank has not regulated the gold market since 2000, when the Financial Services Authority (FSA) was formed. Responsibility for certain aspects of gold market regulation was then transferred to the Financial Conduct Authority (FCA) after the passage of the Financial Markets Act (2012). The Bank is the prudential regulator of some of the institutions that participate in the gold market because they undertake banking, insurance or investment activities.

Gold in one of the Bank of England’s gold vaults



An Ongoing Role

The Bank of England still maintains close links with the market for gold and is a major custodian for gold owned by many of the world’s central banks, the UK Government and certain commercial firms. The Bank of England publishes the amount of gold held in its vaults, the first monthly release was for July 2016 (approximately 159 million ounces), for the most up to date data please see the Bank’s [website](#).

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SECTION 13

Futures Markets and Exchange Traded Products

Futures Markets

Exchange Traded Products



Futures Markets and Exchange Traded Products

While this Guide is concerned with the operation of the global Over The Counter trading of precious metals markets, it would be remiss to ignore other methods by which investors look to gain exposure to precious metals and how they relate to the OTC market.

Futures Markets

Precious metals trade on a large number of futures exchanges around the world. As mentioned earlier in this Guide, in an exchange-traded environment, transactions will be for standard quantities (or their multiples), purities and for delivery on set dates. However, in the OTC market, 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 locations. Thus, OTC markets offer far greater flexibility for clients compared to a futures exchange that operates within standardised parameters.

While there are different delivery locations and dates, and contract specifications (potentially including metal purity and bar size) between the OTC market and the various futures exchanges, it is often possible to switch positions between the two relatively simply. However, this comes with the important proviso that it will depend on applicable laws and the requirements of the various exchanges themselves.

The mechanism for switching a position in gold from/to a futures exchange (CMEs Globex, for example) to/from Loco London OTC gold would be an Exchange For Physical trade – less commonly called an Exchange Futures for Physical trade. However, in both cases, the acronym is simply EFP.

The calculation of the EFP – differential between an OTC spot transaction and a longer-dated futures contract – will vary depending on a number of factors:

- The number of days between spot delivery and futures delivery
- The level of currency and metal interest rates

- The ease, cost and time taken to transport metals between London and the requisite futures location
- The cost of exchanging 995 London Good Delivery Gold to the requisite futures exchange purity and bar size.
- Having bars created by refiners that are on the Good Delivery Lists of the LBMA (or LPPM) or the relevant futures exchange
- Complying with relevant laws and any taxes

Of course, not all futures exchanges quote the precious metals in terms of US dollars. Therefore, there may also be currency exchange rates to take into account.

Exchange Traded Products

More commonly referred to simply as Exchange Traded Funds (ETFs); however, Exchange Traded Products (ETPs) is the wider nomenclature.

These were launched into the precious metal investor community in 2004 and rapidly rose to become one of the largest vehicles for gold ownership, in particular addressing a need for investors who were only allowed to invest in equities but who wanted exposure to gold directly rather than having to invest via mining shares. Thus, the ETFs have given them a vehicle to take a view on precious metal prices without having to analyse the geology of a particular mine, the state of labour relations, the particular political circumstances of where the metal is mined, the expertise of senior management at a mining company and so on.

Following the rapid success of the gold ETFs, the market has launched ETFs in silver, platinum and palladium. The success of these initial funds spawned a large number of variations from the original allocated Loco London. However, those that have achieved some sort of momentum are almost exclusively backed by allocated metal in London or Zurich.

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As in the EFPs and the futures market, it is possible to swap positions between an OTC Loco London position and an ETP. Once again, this will depend on the various laws, taxes and the requirements of the various stock exchanges regarding purity, location, bar size and so on. However, there is an added issue. In general, the majority of commercial banks will trade OTC and metal futures via the same legal entity. However, for a significant number of institutions transacting the equivalent of EFPs between the OTC and equity markets (where the ETFs are generally traded)

is not possible – primarily because they trade equities and metals under different legal entities and the cost of regulatory capital in trying to hold an equity position in a commodities trading unit (or vice versa) might either be extremely expensive or forbidden under the regulations.

However, there are still sufficient institutions that can arbitrage any market anomalies to ensure that both the main traded ETFs and futures exchanges do not get out of line for any extended period with the global OTC market.

Looking down from the podium onto the NYSE trading floor as the LBMA Executive and guests prepare to ring the closing bell



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SECTION 14

Physical Metal

Background

Consignment Stocks

Inventory Financing



Physical Metal

Background

Until 2008, the physical business – which was mainly gold related – relied more or less wholly on supplying those countries that had traditional domestic consumer business. They tended to be India, the Middle East, Turkey and some of the smaller Asian economies. Since the global financial crisis, the physical business has been a fundamental part of the investment market, where beside the off-take from India and more recently China, there have also been a number of European countries focusing on this asset class.

However, unlike Loco London trading, the physical market can require knowledge of a myriad of specific country requirements, the logistics and costs of moving precious metal around the world in various forms prior to fabrication, the manufacturing costs at the various refineries and sourcing refining/manufacturing capacity. There are also the location premiums and discounts, the arbitrage between certain locations, the forward and lease markets, and so on, which all need to be considered as well as the local laws in different jurisdictions.

Consignment Stocks

Primarily, this involves transacting with jewellers and banks generally located in the Far East, Middle East and India. A ‘traditional’ metal consignment was metal stored in the vaults of the customer, which priced down (bought) the stock as required. The risk in this instance was primarily theft or fraud, but that could be mitigated by insurance. However, currently, consignments tend to be stored with a third-party custodian and only released to the customer after pricing – either immediately (carrying a two-day risk) or upon confirmation of receipt of payment.

Consignment stocks generally carry a fee similar to a lease fee (although there may be a limited fee free period) until the metal is priced. Details of how interest is calculated are covered in some depth in section 9.

The LBMA’s generic Consignment Agreement is available on the members’ area of its website.

Inventory Financing

There are various types of inventory financing, from the very basic financing of small bar stocks at a precious metal refinery, or a gold jewellers, to the highly technical financing of platinum and palladium used in various forms in manufacturing processes where the issue of co-mingling may well arise.

Basically, for gold held in bar form in a retail outlet, it is easy to see the asset, but if the metal, particularly in the case of PGMs, is in the form of a catalytic converter in a major oil/chemical refinery then not only is it difficult to distinguish each individual lenders’ metal (due to co-mingling) but also where in the enormous expanse of the industrial plant the catalyst is located.

In general, all financing of inventory will carry credit exposure, but there are various ways to mitigate this exposure for the lender, although precise details will obviously depend on the requirements of the institution advancing currency against a lien, or equivalent, over the metal.



Kilobars on their way to India

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Documentation



Documentation

Given the variety of products provided by members of the market, and in order to avoid the problems inherent in a multiplicity of bilateral agreements to cover the transactions involved, the LBMA, and where appropriate assisted by LPMCL, 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.

The major advantage of standard documentation is that it defines market practice. 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:

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.

Copies of the IBMA may be obtained in print format only from the LBMA – this publication is not available electronically. There is a charge if you are not an LBMA member. Please contact the LBMA if you are interested in obtaining a copy.

The 1997 ISDA Bullion Definitions

The LBMA co-operated with the International Swaps and Derivatives Association to produce these definitions. They 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.

The above information is available on the LBMA's [website](#).

The ISDA Bullion Definitions and the Standard Forms of Confirmation for IRS and FRA transactions are not available from the LBMA. Further information is available on the ISDA [website](#).

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Market Regulation

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Market Regulation

Background

Over The Counter precious metals are traded in a wholesale market for professionals; hence, like the foreign exchange market, it is not directly regulated as a market, although the various products, firms and activities are subject to a number of regulations.

The major participants in the London market are, broadly speaking, authorised banks and investment firms, which are dual-regulated: most are supervised for prudential concerns by the UK's Prudential Regulation Authority (part of the Bank of England) and, for conduct, consumer protection and competition purposes, by the UK's Financial Conduct Authority (FCA).

The PRA and the FCA (and foreign supervisory bodies) work closely together, with the FCA generally taking the lead on UK market-wide issues, and both are represented on the UK's Financial Stability Committee.

The LBMA does not have financial regulatory responsibilities for the OTC precious metal market, but obviously it maintains a close working relationship with the regulators.

Codes of Conduct

Trading in spot, forwards and wholesale deposits in the bullion market was, until recently, underpinned by the Non-Investment Products (NIPs) Code, which was drawn up by participants in the UK foreign exchange, money and bullion markets. Although the provisions under the NIPs code were intended only as guidance on what was believed to constitute good practice in these markets, in practice, the LBMA required all members to comply with it on a mandatory basis.

In 2015, the Bank of England, FCA and HM Treasury provided a number of recommendations under their Fair Effective Markets Review (FEMR). Under this Review, it was decided that the NIPs code would be replaced by a new global Foreign Exchange Code to be published by the Bank of International Settlements, and also that the Bullion annex of the NIPs code would be superseded by the Global Precious Metals Code, which was published by the LBMA on 25 May 2017.

Global Precious Metals Code

The Global Precious Metals Code covers all precious metals and, as with the NIPs Code, compliance with the Precious Metals Code is mandatory for all LBMA members.

The new Code sets out best practice in the precious metals market in a high level of detail and is therefore more comprehensive than the NIPs Code that it has replaced. In addition to market conventions, the Code covers principles that should be adopted by members, including compliance, governance, risk management, and pre and post trade execution. Illustrative examples of acceptable practices are included in the Code.

Printed copies of the Code are available, but the latest version is available on the LBMA's [website](#).



The LBMA's Global Precious Metals Code

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Responsible Sourcing Programme

The LBMA's Responsible Sourcing Programme was set up to consolidate, strengthen, and formalise existing standards of refiners' due diligence. The Responsible Gold Guidance (RGG) has been mandatory for all gold Good Delivery refiners since 2012, and the LBMA has recently expanded the scope of its responsible sourcing framework to include silver which becomes a mandatory requirement for all Silver GDL refiners from 1 January 2018.

Responsible Silver

To reinforce the LBMA's commitment to responsible sourcing practices within the Good Delivery Lists, from 1 January 2018, compliance to the new LBMA Responsible Silver Guidance (RSG) becomes a mandatory requirement for all refiners wishing to sell into the London Bullion Market, and is intended to assure investors and consumers that all London silver stocks are responsibly sourced.

To minimise the additional resources required by refiners who produce both gold and silver GDL bars the silver guidance is aligned with the existing LBMA RGG facilitating the concept of multi-metal audits. The introduction of the new RSG aligns the requirements for both Gold and Silver GDL refiners adding a further layer of credibility to the GDL system.

LBMA Toolkit

Refiners should use the LBMA Toolkit (available on the LBMA [website](#)) to implement the requirements within this Guidance. Refiners may be asked to justify any substantive deviations from the Toolkit (comply or explain).

Governance

The Compliance Officer is responsible for the day to day running of the programme, when non-conformances arise these are escalated to the Audit Review Panel (ARP) for review and action. The ARP report to the Executive Committee (ExCom) on all matters relating to the management, governance and development of the Responsible Sourcing programme. The Physical Committee will be notified of the ARP action. The Regulatory Affairs Committee oversees the policy development and implementation of the Responsible Sourcing programme for example the complaints mechanism and incident handling procedure.

Continuous Improvement

The LBMA regularly reviews the content of its responsible sourcing guidelines to take into account emerging trends, new or amended regulation, ensuring they remain relevant, accurate and provide the correct level of protection to the Good Delivery System.

Annual Audit

It is mandatory for all refiners to use an auditor that has been approved by the LBMA. A list of Approved Service Providers is available on our website and updated on a regular basis.

Incident Review Process

The Incident Review Process is invoked in response to a particular stimulus of a reputational nature, information can come from a variety of sources (trade associations, law enforcement agencies, market intelligence etc.) and the LBMA will seek corroboration wherever possible as part of the process. Due to the sensitivities involved, the LBMA may keep the process confidential until the issue has been resolved. Refiners can raise concerns about the process directly with the LBMA, complaints must be made in writing and accompanied by supporting evidence, examples could be:

- Conduct of an auditor
- Disagreement over the outcome of an audit

The Compliance Officer will review the details of the complaint and the outcome will be formally communicated to all interested parties.

Whistleblowing Policy

Refiners should develop and publicise a mechanism allowing any employee or external stakeholder to anonymously voice concerns over the gold supply chain or any newly identified risk. Similarly people involved in the gold supply chain are encouraged to contact the LBMA with any legitimate concerns they may have over the gold supply chain, a refiners activities or any newly identified risk.

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OECD Due Diligence Guidance and Implementation

The OECD Due Diligence Guidance is seeking to establish a global framework to help companies to manage their mineral supply chains. The objective is to enable companies, through due diligence, to put in risk-based processes that will enable continued sourcing of minerals from high risk locations if the appropriate processes and controls are in place.

The LBMA encourages refiners to go beyond the minimum requirements of due diligence and demonstrate “Best Practice” in sourcing responsibly.

The LBMA also encourages refiners to develop systems and processes that develop and enhance supply chain flexibility and adaptability.

LBMA Members as well as refiners have contributed to this work. Ruth Crowell, the LBMA’s Chief Executive also acted as the co-facilitator of the OECD Gold Supplement Drafting Committee and Vice-Chair of the OECD Multi-stakeholder Governance Group.

Responsible Sourcing Summary

The LBMA Guidance documents should be interpreted as a minimum threshold upon which Refiners should build and continually improve their due diligence practices across each of the key areas. The concept of continual improvement is an integral component of the LBMA responsible sourcing programmes and underpins the spirit of the LBMA’s five step framework.

The LBMA also supports initiatives facilitating responsible supply chains for all forms of mining in areas of conflict or human rights abuse high-risk.

Benchmarks

This topic is dealt with extensively in section 11. However, since December 2014, the LBMA’s wholly owned subsidiary, Precious Metals Prices Ltd, has owned the daily spot price benchmarks for gold, silver, platinum and palladium. Prior to this, the LBMA had no formal role in the precious metals benchmarks as the administration and distribution was overseen by three separate Fixing Companies.

Platinum Group Metals

The principal-to-principal platinum and palladium market is not in itself FCA-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 FCA-regulated by virtue of other aspects of their business.

The open pit at AngloGold Ashanti’s Sunrise Dam operation in Western Australia



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SECTION 17

Taxation



Taxation

Her Majesty's Revenue & Customs (HMRC) considers Full Members of the LBMA to be official members of the market that can therefore trade under the terms of the Terminal Market Order (TMO).

The TMO, the oldest part of the UK's Value Added Tax (VAT) legislation, was intended to be VAT neutral. It was put in place to minimise the VAT administration burden as far as the UK commodity markets were concerned in order to maintain their competitiveness, particularly in regard to non-EU markets.

A Memorandum of Understanding (MOU) has been signed between HM Revenue & Customs and the LBMA and the LPPM. It is intended to assist members of both associations to:

- understand the transactions that take place on the London bullion market
- determine the supplies that take place for VAT purposes
- determine the liability to VAT of those supplies in respect of the different precious metals and markets
- confirm those transactions that need to be reported on quarterly statistical reports of cross-border services.

The purpose of the MOU is to provide background information on trades typically effected by LBMA and LPPM members, their current treatment for VAT purposes and where greater clarity and certainty can be introduced. The MOU is available on the [LBMA](#) and [LPPM](#) websites.

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.

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SECTION 18

Conversion Table



Conversion Table

The table below lists the amount of fine gold in troy ounces in bars of a given size and purity.

	995.0	999.0	999.9
1 kilo	31.99	32.119	32.148
½ kilo	15.995	16.059	16.074
¼ kilo	7.998	8.03	8.037
200 grams	6.398	6.424	6.43
100 grams	3.199	3.212	3.215
50 grams	1.6	1.607	1.608
20 grams	0.64	0.643	0.643
10 grams	0.321	0.322	0.322
5 grams	0.161	0.161	0.161
100 ounces	99.5	99.9	99.99
50 ounces	49.75	49.95	49.995
25 ounces	24.875	24.975	24.998
10 ounces	9.95	9.99	9.999
5 ounces	4.975	4.995	5
1 ounce	0.995	0.999	1
10 tolas	3.731	3.746	3.75
5 taels	5.987	6.011	6.017

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SECTION 19

Key Facts about Precious Metals

Gold

Silver

Platinum

Palladium



Key Facts about Precious Metals



Gold (Source: Thomson Reuters)

- Total world mine supply for 2016 was 3,222 tonnes
- All-in sustaining mining costs were \$818 per ounce as against total cash costs of \$630 per ounce
- China is the world's largest producer of gold, mining 453.5 tonnes in 2016
- Total scrap supply for 2016 was 1,268 tonnes
- The largest demand component for gold in 2016 was for jewellery, which comprised 1,891.5 tonnes
- Industrial fabrication only accounted for a total of 353.8 tonnes, for which electronics was the largest component
- Total identifiable investment demand was 1,579 tonnes in 2016
- India imported 510.6 tonnes of gold in 2016
- China's total gold demand (excluding central bank purchases) was 968 tonnes in 2016



Platinum (Source: Johnson Matthey)

- Total mine supply for 2016 was 6.1 million ounces (189 tonnes)
- South Africa produced 4.392 million ounces (136.6 tonnes or 72% of the total)
- The balance was from Russia (22.5 tonnes) and others (30.7 tonnes)
- Global autocatalyst demand for platinum reached 3.32 million ounces (103.2 tonnes) in 2016. This was over 40% of the total global demand for platinum
- While autocatalysts are the primary usage for platinum, jewellery is second at 2.45 million ounces (76 tonnes)
- China dwarfs the rest of the world in terms of platinum jewellery demand, with some 47 tonnes being required in 2016 – nearly 5 times its nearest rival (Japan)



Silver (Source: Metal Focus)

- Total mine supply for 2016 was 889.5 million ounces (27,666 tonnes)
- Total recycled supply for 2016 was 161.5 million ounces (5,023 tonnes)
- The largest demand component for silver was industrial fabrication of 487.4 million ounces (15,160 tonnes), and the largest section within this was electrical and electronics at 292.7 million ounces (9,103 tonnes)
- Mexico was once again the largest producing country with a total 184.8 million ounces (5,747 tonnes) of silver produced in 2016
- The world's largest mining company was Fresnillo, with 45.7 million ounces (1,421 tonnes) of silver produced in 2016
- Production by source metal included 68% by-product production from lead/zinc, copper and gold mines, with production from primary silver operations at 31%
- All-in sustaining costs (AISC) at primary silver producers averaged \$8.97 per ounce in 2016 (including by-product credits). Total cash costs (TCC) averaged \$4.79 per ounce
- In 2016, silver jewellery fabrication was dominated by India which accounted for 53.9 million ounces (1,677 tonnes), almost double compared to China which accounted for 28.7 million ounces (893 tonnes)



Palladium (Source: Johnson Matthey)

- Total mine supply for 2016 was 6.76 million ounces (210 tonnes)
- Russia was the largest producer at 2.77 million ounces (86 tonnes), with South Africa second at 2.57 million ounces (80 tonnes)
- Global autocatalyst demand for palladium was 7.94 million ounces (247 tonnes). This was over 84% of total global demand for palladium
- While autocatalysts are the primary usage for palladium, electrical is second at 953,000 ounces (29.6 tonnes)
- In 2016, world consumption of palladium in jewellery alloys was 189,000 ounces (5.9 tonnes)

Except where stated, the information outlined on this page comes from the following sources:

GFMS Gold Survey 2017

Produced by Thomson Reuters

Metal Focus Silver Focus 2017

Produced by Metal Focus

PGM Market Report May 2017

Produced by Johnson Matthey

The word 'tonne' always denotes a metric tonne of 1,000 kilograms.

Please note that in the data above, brevity has been prioritised and so headline statistics have been used. The information provided is not intended to replace the full reports from Thomson Reuters, Metal Focus, Johnson Matthey and other sources of research into precious metals. For example, the fact that, for palladium, mine supply was only 210 tonnes and yet autocatalyst demand was 247 tonnes is not a misprint, but a reflection that recycling and stockpile reduction have not been listed above.

The most up to the date information should be sourced directly from the various companies engaged in producing research into precious metals.

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Clearing Statistics



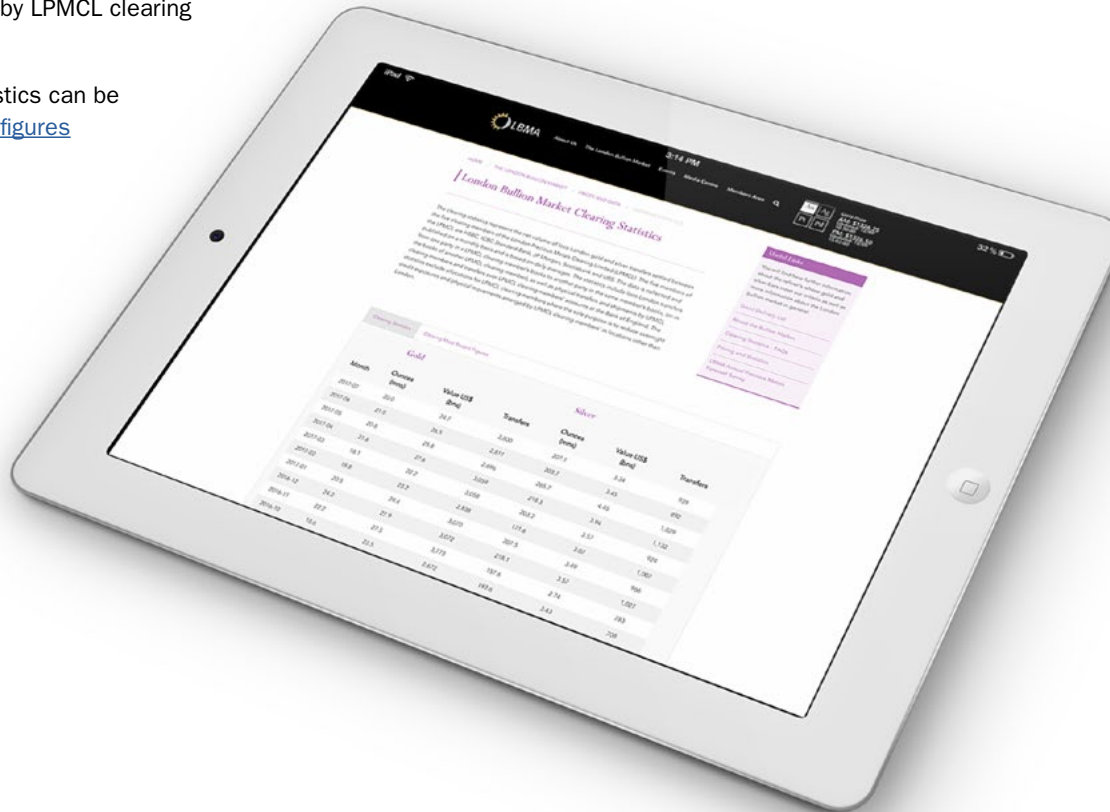
Clearing Statistics

Full details can be found on the LBMA's [website](#).

The clearing statistics have historically represented the net volume of Loco London gold and silver transfers settled between the clearing members of the London Precious Metals Clearing Limited (LPMCL – www.lpmcl.com).

The members of LPMCL are: HSBC, ICBC Standard Bank, JP Morgan, Scotiabank and UBS. The data is collected and published on a monthly basis and is based on daily averages. The statistics include Loco London transfers from one party in a LPMCL clearing member's books to another party in the same member's books (or in the books of another LPMCL clearing member), as well as physical transfers and shipments by LPMCL clearing members and transfers over LPMCL clearing members' accounts at the Bank of England. The statistics exclude allocations for LPMCL clearing members where the sole purpose is to reduce overnight credit exposures and physical movements arranged by LPMCL clearing members in locations other than London.

The latest information including monthly statistics can be found on the LBMA's website for [most recent figures](#) and [clearing statistics](#).



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Market Trade Statistics



Market Trade Statistics

Because clearers will generally try and net payments between themselves and their clients, clearing statistics can never be a complete picture of the depth of the global Over The Counter market for precious metals. In October 2016, the LBMA announced that Boat Services Ltd (a fully owned subsidiary of Cinnober), in a joint submission with Autilla, had been selected as the chosen provider for trade reporting.

The purpose of trade reporting is to enhance transparency within the market and give interested parties a much clearer picture of the size of the international precious metal markets. The Fair and Effective Markets Review (FEMR) Implementation Report of July 2016 also acknowledged that the LBMA has been “focusing on trade reporting as a priority in response to the market commitment by LBMA members to enhance transparency”.

The LBMA has introduced a new system under which OTC market participants will report trades. The initiative has three clear benefits: it will create an accurate picture of the size and shape of the market; it will promote transparency for existing and potential investors; and it will engender confidence in the liquidity and efficiency of the OTC market.

Initially, all trading members will report their OTC trades. Once the dataset is live in 2018, reporting requirements will be extended to ensure that the data ultimately reflects the size of the global OTC market.

The system is capturing trades through a hub known as LBMA-i, which is powered by financial technology operator Autilla. LBMA Market-Makers have already started reporting, followed by other trading members later in 2017. Following a period of quality checking, it is expected that the first set of data will be published in 2018.

Silver bars held in a vault



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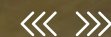
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Central Bank and Governmental Ownership of Gold



Central Bank and Governmental Ownership of Gold

There is a great deal of interest in the precious metals holdings of governments and central banks. Central banks generally report their holdings to the International Monetary Fund (IMF) on a monthly basis. However, Sovereign Wealth Funds (SWFs) and other government entities may not be required to report in the same way. So, where these holdings might exist, they are likely to be additional to the figures below.

The information on page 78 and 79 was updated in February 2017 by the World Gold Council and data reports available at that time. Data is taken from the International Monetary Fund’s International Financial Statistics (IFS), February 2017 edition, and other sources where applicable. IFS data is two months in arrears, so holdings are as of December 2016 for most countries, and November 2016 or earlier for late reporters. The table does not list all gold holders: countries which have not reported their gold holdings to the IMF in the last six months are not included, while other countries are known to hold gold but do not report their holdings publicly. Where the WGC knows of movements that are not reported to the IMF or misprints, changes have been made.

Full details can be found on the WGC [website](#).



The Bank of England in springtime

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World Official Gold Holdings

International Financial Statistics, February 2017

		Tonnes	% of reserves*
1	United States	8,133.5	73.8%
2	Germany	3,377.9	67.6%
3	IMF	2,814.0	
4	Italy	2,451.8	66.8%
5	France	2,435.8	61.5%
6	China	1,842.6	2.2%
7	Russia	1,615.2	15.2%
8	Switzerland	1,040.0	5.6%
9	Japan	765.2	2.3%
10	Netherlands	612.5	62.8%
11	India	557.8	5.7%
12	ECB	504.8	25.6%
13	Taiwan	423.6	3.5%
14	Portugal	382.5	56.4%
15	Turkey	377.1	13.1%
16	Saudi Arabia	322.9	2.2%
17	United Kingdom	310.3	8.5%
18	Lebanon	286.8	19.8%
19	Spain	281.6	16.5%
20	Austria	280.0	44.4%
21	Kazakhstan	258.1	32.1%
22	Belgium	227.4	35.7%
23	Philippines	196.3	8.9%
24	Venezuela	187.5	63.5%
25	Algeria	173.6	5.1%
26	Thailand	152.4	3.3%
27	Singapore	127.4	1.9%

28	Sweden	125.7	7.8%
29	South Africa	125.3	9.9%
30	Mexico	120.5	2.5%
31	Libya	116.6	5.9%
32	Greece	112.8	60.7%
33	Korea	104.4	1.0%
34	BIS	104.0	
35	Romania	103.7	9.6%
36	Poland	103.0	3.3%
37	Iraq	89.8	7.0%
38	Australia	79.9	5.3%
39	Kuwait	79.0	8.3%
40	Indonesia	78.1	2.6%
41	Egypt	75.6	15.3%
42	Brazil	67.3	0.7%
43	Denmark	66.5	3.8%
44	Pakistan	64.5	10.8%
45	Argentina	56.8	5.4%
46	Finland	49.1	17.3%
47	Belarus	46.2	34.7%
48	Bolivia	42.5	15.2%
49	Bulgaria	40.3	5.9%
50	Jordan	38.3	9.7%
51	Malaysia	38.3	1.5%
52	WAEMU ³	36.5	10.8%
53	Peru	34.7	2.1%
54	Qatar	32.2	3.4%
55	Slovakia	31.7	40.5%
56	Syria	25.8	5.4%
57	Ukraine	25.5	6.0%
58	Sri Lanka	22.3	15.9%

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World Official Gold Holdings

International Financial Statistics, February 2017

		Tonnes	% of reserves*
59	Morocco	22.0	3.2%
60	Azerbaijan	22.0	12.5%
61	Afghanistan	21.9	11.3%
62	Nigeria	21.4	2.5%
63	Serbia	18.6	6.6%
64	Tajikistan	14.4	80.5%
65	Cyprus	13.9	63.0%
66	Bangladesh	13.8	1.6%
67	Cambodia	12.4	5.1%
68	Mauritius	12.4	9.2%
69	Ecuador	11.8	11.3%
70	Czech Republic	9.8	0.4%
71	Ghana	8.7	7.0%
72	Paraguay	8.2	4.4%
73	United Arab Emirates	7.6	0.4%
74	Myanmar	7.3	3.6%
75	Guatemala	6.9	2.8%
76	Macedonia	6.9	9.2%
77	Tunisia	6.8	3.4%
78	Latvia	6.6	6.9%
79	Nepal	6.1	2.7%
80	Ireland	6.0	6.2%
81	Lithuania	5.8	8.2%
82	Colombia	5.3	0.4%
83	Bahrain	4.7	2.9%
84	Kyrgyz Republic	4.6	8.6%
85	Mozambique	4.4	7.6%

86	Brunei Darussalam	3.8	3.9%
87	Slovenia	3.2	15.8%
88	Aruba	3.1	12.1%
89	Hungary	3.1	0.4%
90	Bosnia and Herzegovina	3.0	2.1%
91	Luxembourg	2.2	8.5%
92	Hong Kong	2.1	0.0%
93	Iceland	2.0	1.0%
94	Papua New Guinea	2.0	4.4%
95	Trinidad and Tobago	1.9	0.7%
96	Haiti	1.8	3.1%
97	Mongolia	1.7	4.9%
98	Albania	1.6	2.0%
99	Yemen	1.6	1.1%
100	El Salvador	1.4	1.6%

	Other	Tonnes	% of reserves*
	World	33,259.2	
	Euro Area (incl. ECB)	10,786.0	53.6%
	CBGA 4 signatories ⁵	11,951.8	29.7%

*The percentage share held in gold of total foreign reserves, as calculated by the World Gold Council. The value of gold holdings is calculated using the end-of-month LBMA Gold Price published daily by ICE Benchmark Administration. In December 2016 the end-of-month gold price was \$1145.90. Data for the value of other reserves is taken from IFS, table 'Total Reserves minus Gold'.

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SECTION 23

Properties of Precious Metals

Gold

Silver

Platinum

Palladium



Properties of Precious Metals



Gold (courtesy of the World Gold Council)

- Gold's ability to conduct electricity makes it an indispensable component in electronics. Completely resistant to corrosion, it is the undisputed material of choice to guarantee reliability in a broad range of high-performance and safety-critical applications. Indeed, in recent years, the electronics sector alone has accounted for more than 300 tonnes of global annual demand, underlining its value in these applications.
- Exceptionally malleable and ductile, one ounce of gold can be beaten into a translucent sheet 0.000018 cm thick and covering 9 square metres, or pulled into a wire 80 km (50 miles) long. At 5 microns in diameter, the wire would be 20 times thinner than a human hair.
- Gold's catalytic properties – it accelerates the rate of chemical reactions without being consumed – means that it is becoming an important component in many industrial processes. It is a proven material for use in catalytic converters, which reduce the toxicity of exhaust fumes, and plays a role in the production of a range of chemicals we all use on a day-to-day basis. The new gold catalysts that are currently being developed could reduce the impact of airborne and water-borne pollution, and the importance of gold in fuel cells puts the metal at the heart of technologies for a cleaner energy future.
- These unique qualities mean there are many industrial uses of gold, including for engineers in the aerospace and construction industries. NASA protects its astronauts and equipment from radiation and heat with a layer of gold, while a film of the metal coats all 14,000 windows of the Royal Bank Plaza building in Toronto, Canada.
- Because it does not corrode, gold has been used in dentistry for centuries, and gold alloys are still used today. The metal's biocompatibility – it rarely has any negative effects when placed in contact with the human body and resists infection – makes it a natural choice for other sensitive implants, such as those in the inner ear or eyelids.

- The medical applications of gold are wider still. Gold-based drugs have been developed and used to treat illnesses such as rheumatoid arthritis. Research is currently ongoing into the role that gold can play in cancer treatment.
- As understanding of nanotechnology reveals gold's unique qualities at the nano-scale, further biomedical uses are being found for the metal. It has been deployed in a range of cutting-edge techniques for diagnosing diseases.



Silver (courtesy of the Silver Institute)

- Of all the elements, silver is the best conductor of electricity. On a scale of 0-100, silver ranks at 100, with copper at 97 and gold at 76. As such, it has a number of important applications in the electronics industry.
- Silver has excellent antimicrobial properties, and is commonly used in various health and environmental applications, including wound treatments and water purification.
- Like many other metals, silver is an effective chemical catalyst. It is central to the production of ethylene oxide, which is the chemical 'building block' of a range of plastics. Hundreds of millions of ounces of silver reside in chemical plants around the world for this reason.
- Silver pastes are critical in the manufacture of photovoltaic cells, which are used for the production of solar energy.
- Many lightweight, high-capacity batteries employ silver oxides or silver-zinc alloys in their design.

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Platinum (courtesy of Johnson Matthey)

- One of the densest metals (ca. 20 g cm⁻³).
- Genuinely rare, annual production is less than a tenth of that of gold.
- Precious: it was used by the ancient Incas to make ornaments and today is very popular for wedding rings, particularly in Asian countries.
- Its melting point is so high (1,768°C) that it was impossible to melt until the invention of the oxygen flame and it was melted for the first time in 1782 in France.
- It is very inert: biomedical devices used inside a living body, from pacemakers to very simple bone pins to help broken bones heal correctly, use platinum so that they do not harm the tissues around them.
- Platinum does not corrode even at high temperatures, so it is used in equipment to make fibreglass and to make extremely pure glass for flat screen TVs and mobile phones.
- The largest use of platinum in the present day is in automobile exhaust catalysts, which remove harmful pollutants from vehicles.
- A cure for cancer: cisplatin contains platinum and is still one of the most effective anticancer agents of modern times.
- A platinum rod 10 cm long and 1 cm in diameter can be drawn into a wire approximately 2,777 km long – making platinum theoretically seven times more ductile than gold.



Palladium (courtesy of Johnson Matthey)

- A precious metal that does not tarnish and is naturally 'white'.
- Named after Pallas, the ancient Greek goddess of wisdom.
- Russia is the biggest producer and it is also produced in North America and South Africa.
- It is about half as dense as platinum or gold, which means that it can be used to make larger but lighter jewellery.
- Palladium can absorb an astonishing 900 times its own volume of hydrogen – making it great for storing hydrogen safely.
- Silver-palladium tubes are used in hydrogen generators and utilised for such diverse applications as the manufacture of semiconductors, annealing of stainless steel and cooling of power station alternators.
- The 2010 Nobel Prize in Chemistry was for palladium-catalysed cross-coupling, a process used today all over the world to manufacture products from edible oils to painkillers and novel drugs.
- Dental alloys with palladium contents of between 40% and 60% are used to make crowns and bridges with a 'white' colour that are compatible with currently used dental porcelains.
- Used in three-way catalysts for super ultra low emission vehicles (SULEVs), with astonishing performance and durability using relatively low loadings.

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SECTION 24

Frequently Asked Questions



Frequently Asked Questions

1. What is the LBMA?

The London Bullion Market Association (LBMA) is an international trade association, representing the global market for gold and silver bullion which has a global client base. This includes the majority of the gold-holding central banks, private sector investors, mining companies, producers, refiners and fabricators. The on-going work of the Association covers a number of areas, among them refining standards, trading documentation and the development of good trading practices.

The maintenance of the Good Delivery List, including the accreditation of new refiners and the regular retesting of listed refiners, is the most important core activity of the LBMA. The LBMA Brochure provides further information about the LBMA.

The LBMA website is: www.lbma.org.

2. What is the LPPM?

The London Platinum and Palladium (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 & Customs. It ensures the continued evolution and health of a marketplace for platinum and palladium in which all participants can operate with confidence.

The LPPM website is: www.lppm.com

3. What is LPMCL?

Most global OTC gold and silver trading and to a lesser extent platinum and palladium is cleared through the London clearing system, managed by the London Precious Metal Clearing Limited (LPMCL), which operates a central electronic metal clearing hub, with deals between parties throughout the world settled and cleared in London.

The most widely traded market for bullion dealing globally is for delivery of metal in London. Consequently, the volume of Loco London metal settlements between counterparties requires an effective and efficient daily clearing system of paper transfers, which avoids the security risks and costs inherent in the physical movement of metal. LPMCL, which is operated by its members, provides an electronic matching system to effect the daily settlements in gold, silver, platinum and palladium.

The LPMCL website is: www.lpmcl.com

4. What does OTC mean?

OTC stands for Over The Counter as opposed to an exchange traded environment. While transactions between members of the LBMA and LPPM 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 locations. Thus, OTC markets offer far greater flexibility for clients compared to a futures exchange that operates with standardised contract sizes, delivery dates and settlement locations.

5. Are there benchmark metal prices?

There are daily benchmarks for gold (twice daily at 10.30am and 3pm), silver (once daily at noon) as well as platinum and palladium (twice daily at 9.45am and 2pm). The palladium auction follows immediately after the auction for platinum. All times referred to are London time not GMT.

Details of the LBMA prices for all four metals can be found in section 11.

6. Who is responsible for the metal benchmarks?

The intellectual property for all four global precious metal benchmarks is held by Precious Metals Prices Limited, subsidiary company of the LBMA. However, the auctions themselves are independently administered by third party providers. Full details of the benchmarks can be found on the LBMA's [website](http://www.lbma.org).

Details of the LBMA prices for all four metals can be found in section 11.

7. How much gold is held in London vaults?

As at end March 2017, there was 7,449 tonnes of gold valued at the time at \$298 billion.

8. How much silver is held in London vaults?

As at end March 2017, there was 32,078 tonnes of silver valued at the time at \$19 billion.

9. What is an EFP?

EFP stands for Exchange For Physical. It is the mechanism by which Loco London OTC positions are switched with those on futures exchanges.

Further details are provided in section 13.

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10. What is an ETP/ETF?

Exchange Traded Product (ETP) and Exchange Traded Fund (ETF) are two terms used for investments in metals, as well as other assets, that are traded as individual securities on a stock exchange.

Further details are provided in section 13.

11. What does Loco London mean?

Loco London is simply a metal trade where the metal part of the transaction settles over accounts held in London.

12. What does Loco Zurich mean?

Loco Zurich is simply a metal trade where the metal part of the transaction settles over accounts held in Zurich.

13. What is a Loco swap?

A Loco (location) swap is an agreement to exchange equivalent quantities of metal in two separate locations. One location will almost invariably be London. The other could be a variety of places but perhaps most commonly will be Zurich.

The trade is booked as the purchase of metal in one location and the sale of an equivalent amount in another. The price differential will be a reflection of the demand for metal in each location, but at its simplest, may be nothing more than the cost of shipping the metal into London, plus refining costs if appropriate. Conventionally, this transaction will take place on the spot date with the currency aspect net settled. Obviously, the metal part of the transaction cannot be offset as the deliveries are for different locations.

14. What is a troy ounce?

The troy ounce is the standard unit of measurement for precious metals. In everyday life, we use avoirdupois ounces, which are smaller than troy ounces, or 'ounces troy', which is the correct terminology but is almost never used. The term is thought to originate from a medieval gold fair that was held in the French town of Troies. A troy ounce is 1.09714 avoirdupois ounces.

There is more information on troy ounces in section 4 and a conversion table appears in section 18.

15. What are PGMs?

PGMs stands for Platinum Group Metals. By market convention, this term is generally used to solely refer to platinum and palladium, rather than the wider group which appears on the periodic table – namely, platinum and palladium plus rhodium, osmium, ruthenium and iridium.

16. What is an unallocated metal 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. A common analogy is having a current or checking account at a bank.

More information is provided in section 8.

17. What is an allocated metal account?

An account where specific bars are set aside and the account holder knows the precise bars that they own. The account operator is basically a custodian of the metal. A common analogy is having a safe deposit box.

More information is provided in section 8.

18. What is the conversion factor between...?

Tables of the various conversion factors are provided in section 18.

19. What is contango?

A contango market is when the forward price – the price for delivery of metal further ahead than two business days – is higher than the spot price.

More information is provided in section 9.

20. What is backwardation?

Backwardation is the opposite of contango and is when the forward price – the price for delivery of metal further ahead than two business days – is lower than the spot price.

More information is provided in section 9.

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21. Do metals have interest rates?

Yes is the simple answer, with the level of the rates set by relative interest in borrowing or lending for the relevant metal.

More details are provided in section 9.

22. How much gold has ever been mined?

It has been estimated (by GFMS Thomson Reuters) that by 2016, approximately 187,200 tonnes, or roughly 6 billion ounces, has been recovered in human history.

23. Is a gold kilobar London Good Delivery?

As kilobars do not meet all the criteria for London Good Delivery, they are not regarded as Good Delivery bars.

However, as the LBMA has become the de facto authority on quality standards applied to gold and silver bullion, it will, when appropriate, collaborate with geographically relevant organisations to ensure the highest possible standards are maintained and the appropriate level of support is provided to the Good Delivery List (GDL) refiners.

Further information is provided in section 5.

24. What is RGG?

RGG stands for Responsible Gold Guidance. In order to respond to US Conflict Mineral legislation, the LBMA took its role as accreditor of the world's gold refiners very seriously by expanding the scope of its requirements, to include corporate social responsibility, by the creation of the Responsible Gold Guidance (RGG). Ultimately, it will be superseded by Responsible Sourcing Guidance (RMG), which will encompass silver, platinum and palladium as well.

See section 16 for more information.

25. What is RSG?

RSG stands for Responsible Sourcing Guidance. While the LBMA originally put in place a robust framework to ensure compliance with its Responsible Gold Guidance scheme, it has subsequently responded to industry demands to broaden the scope of the Guidance to include precious metals other than gold.

See section 16 for more information.

26. How much gold do central banks own?

33,259.2 tonnes of gold – according to data compiled by the World Gold Council using information taken from the International Monetary Fund's International Financial Statistics (IFS), February 2017 edition, and other sources where applicable.

See section 21 plus the World Gold Council's [website](#) for the most up-to-date information.

27. Where do central banks hold their gold?

It will generally be a combination of their own domestic vaults, the Bank of England in London and the Federal Reserve in New York.

28. Which country's government or central bank holds the most gold?

The USA held 8,133.50 tonnes of gold as of February 2017, according to data compiled by the WGC using information taken from the IMF's International Financial Statistics (IFS) and other sources where applicable.

This is over twice as much as the second in the list, which is Germany's Bundesbank with 3,380.20 tonnes.

Details are provided in section 21, also see the WGC's [website](#) for the most up-to-date information.

29. What is the deepest gold mine?

AngloGold Ashanti's Mponeng is one of the world's deepest of any type of mine, mining at depths of between 2,400m and 3,900m. To go any deeper produces further significant challenges. As AngloGold Ashanti notes:

- Increased costs: It would require more development work, including infrastructure at times, which increases costs.
- Low productivity: It poses increased distances to mine face which reduces productivity due to longer travel time before starting to do the actual work.
- Safety: the deeper we go the greater the technical difficulty – rock stress, ambient rock temperature, etc.
- The AngloGold Ashanti Technology Innovation Consortium is aimed at dealing with these challenges – specifically in the development of key technologies to achieve the project's core objective to "Safely Mine, All the Gold, Only the Gold, All the Time" from our deep-level underground mines in South Africa.

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30. What is the 'standard' price for precious metals?

The Loco London spot price is the standard for gold and silver. Metal to be delivered to any other date, bar size, purity or location will be quoted as a premium or discount to this price.

The picture for platinum and palladium is more nuanced between Loco London and Loco Zurich.

See sections 4 and 11 for more information.

31. What are the Good Delivery Lists?

The quality assurance work undertaken by the LBMA and the LPPM means that the maintenance and publication of the Good Delivery Lists for gold, silver, platinum and palladium are universally acknowledged as the de facto international standard for precious metals.

In the refining industry, accreditation to these Good Delivery Lists is globally recognised as the benchmark standard for bars, due to the stringent criteria that an applicant must satisfy. The Lists are also used by many precious metals exchanges around the world to define in whole, or in part, the refiners whose bars are accepted in their own markets.

See sections 5 and 6 for more details.

32. What is the World Gold Council?

"The World Gold Council is the market development organisation for the gold industry. Our purpose is to stimulate and sustain demand for gold, provide industry leadership, and be the global authority on the gold market. We develop gold-backed solutions, services and products, based on authoritative market insight and we work with a range of partners to put our ideas into action. As a result, we create structural shifts in demand for gold across key market sectors. We provide insights into the international gold markets, helping people to understand the wealth preservation qualities of gold and its role in meeting the social and environmental needs of society. Based in the UK, with operations in India, the Far East and the US, the World Gold Council is an association whose members comprise the world's leading gold mining companies."

The World Gold Council website is: www.gold.org

33. Who is the Goldsmiths' Company?

"One of the Twelve Great Livery Companies of the City of London, the Goldsmiths' Company received its first Royal Charter in 1327. The Company's Assay Office has been responsible since 1300 for testing the quality of precious metals.

The Company is the principal patron of modern jewellers and silversmiths, continuing to play an important role in support of the craft, funding apprenticeships and assisting with the technical training of aspiring designer-makers. 2012 saw the opening of the Goldsmiths' Centre in Clerkenwell, a state-of-the-art home for the Goldsmiths' Institute comprising workshops, exhibition space and conference facilities. The Company supports a wide range of other charitable causes and pursues a number of educational projects with schools.

The Goldsmiths' Company's private collection of silver is one of the largest in the UK, comprising 8,000 items dating from 1300 to the present day. Its contemporary collections are world renowned."

The Goldsmiths' Company website is: www.thegoldsmiths.co.uk

34. Who are GFMS and Thomson Reuters?

"The GFMS metals research and analysis body has 50 years' continuous experience in the bullion market, especially gold, dating back to the publication of the first annual "Gold Survey" by then mining giant Consolidated Gold Fields in 1967. Through careful handling of continuity the organisation has a reputation for integrity and confidentiality that gives GFMS unparalleled relationships with stakeholders across all levels of the global precious metals markets. GFMS was acquired by Thomson Reuters in 2011 and sits in the Financial & Risk division of the group, as distinct from the News gathering service."

"Thomson Reuters is the world's leading source of news and information for professional markets. Our customers rely on us to deliver the intelligence, technology and expertise they need to find trusted answers. The business has operated in more than 100 countries for more than 100 years. Thomson Reuters shares are listed on the Toronto and New York Stock Exchanges."

The Thomson Reuters website is: www.thomsonreuters.com

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35. Who is Metals Focus?

Metals Focus is one of the world's leading independent precious metals consultancies. We specialise in delivering research into the global gold, silver, platinum and palladium markets, producing short and long-dated forecasts, mine production costs as well as doré flows services. We also produce three annual reports in English (featuring country-by-country analysis) and, working with the China Gold Association, we also publish these three flagship reports in Chinese. In addition, Metals Focus provides the World Gold Council with the quarterly statistics for their Gold Demand Trends report. Finally, our historic supply/demand series, across the four precious metals, are all available on Bloomberg.

The Metals Focus website is: www.metalsfocus.com

36. Who is Johnson Matthey?

At Johnson Matthey our history with Platinum Group Metals goes back more than 150 years. In that time we've innovated many products and technologies from these amazing metals – from catalysts that prevent toxic emissions and make processes more efficient to anticancer drugs and micromachined medical device components that improve lives. These innovations are underpinned by our ongoing investment in R&D. Around 13% of our people work in R&D and in 2015/16 we upped our R&D spend by 11% to £188 million. With the best scientists and world class facilities, we partner with customers to discover solutions to their challenges.

The Johnson Matthey website is: www.matthey.com

37. What is the Silver Institute?

The Silver Institute is a non-profit international association that draws its membership from across the breadth of the silver industry. This includes leading silver mining houses, refiners, bullion suppliers, manufacturers of silver products and wholesalers of silver investment products. Established in 1971, the Institute serves as the industry's voice in increasing public understanding of the many uses and values of silver.

The goals of The Silver Institute are to:

- Encourage the development and uses of silver and silver products
- Help develop markets for silver and its products
- Foster research and development related to the present and prospective uses of silver
- Collect and publish statistics and other information about production, distribution, marketing, consumption and the uses of silver and silver products
- Spread knowledge and understanding of the uses of silver
- Develop methods for improving the welfare of the silver industry.

The Silver Institute website is: www.silverinstitute.org

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SECTION 25

Annexes

Glossary of Terms

Basic Market Definitions

Conventions



Annexes

The following annexes have been taken from the Precious Metal Code which was published by the LBMA on 25 May 2017. To avoid confusion the numbering of these sections has remained as it is in the Code. Further information on the Code can be found in section 16. For the latest, and full, version of this important document the LBMA's [website](#) should be consulted.

Glossary of Terms

Agent

A Market Participant that transacts on behalf of and for the account of a Client.

Axe

An interest that a Market Participant might have to transact in a given product at a price that may be better than the prevailing market rate.

Benchmark

Includes LBMA Gold Price, LBMA Silver Price, LBMA Platinum Price, LBMA Palladium Price.

Benchmark Process

The methodology used to determine the Benchmark, for example, but not limited to, an auction.

Clients

Market Participants making requests, placing orders and subsequently executing trades through a dealer.

Confidential Information

Information that is treated as confidential, including Precious Metals Trading Information and Designated Confidential Information:

- Precious Metals Trading Information. This can take various forms, including information relating to the past, present and future trading activity or positions of the Market Participant itself or of its Clients, as well as related information that is sensitive and is received or produced in the course of such activity. Examples include but are not limited to:
 - details of a Market Participant's order book;
 - other Market Participants' Axes;
 - spread matrices provided by Market Participants to their Clients; and
 - orders for and during the Benchmark Process.

Designated Confidential Information

Confidential, proprietary and other information for which Market Participants may agree to a higher standard of non-disclosure, which at their discretion, may be formalised in a written non-disclosure or similar confidentiality agreement.

Mark Up

The spread or charge that may be included in the final price of a transaction in order to compensate the Market Participant for a number of considerations, which might include risks taken, costs incurred and services rendered to a particular Client.

Market Colour

A view shared by Market Participants on the general state of and trends in the market

Market Maker

A Market Participant that has been granted the status of Market Maker by the LBMA.

Market Order

A counterparty instructs a Market Participant to execute a Precious Metals transaction at the current available level. A Market Order is placed without any limit price, and the entire order is executed at a fair and transparent price and in a reasonable time frame.

Market Participant

Entity participating in the wholesale Precious Metals market.

Personal Dealing

Where staff deal for their personal or indirect benefit (e.g. for their immediate family members or other close parties).

Precious Metals

In the context of this Code, this term refers to gold, silver, platinum, and platinum.

Precious Metals Code

The global set of principles for good practice in the wholesale Precious Metals market.

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Precious Metals Trading

Can take various forms, including information relating to the past, present and future trading activity or positions of the Market Participant itself or its Clients, as well as related information that is sensitive and is received in the course of such activity.

Pre-Hedging

Hedging of an expected Client transaction.

Principal

A Market Participant that transacts for its own account.

Responsible Sourcing

Responsible Sourcing requires Market Participants to have management systems and controls in place to address identified risks in the supply chain. This includes the LBMA Responsible Gold Guidance (RGG), based on the OECD Due Diligence Guidance, as well as the US and Swiss Know Your Client, Anti-Money Laundering and Combating Terrorist Financing regulations..

Stop Loss Orders

A contingent order, which triggers a buy or sell order for a specified notional amount when a reference price has reached or passed a predefined trigger level. There are different variants of Stop Loss Orders, depending on the execution relationship between counterparties, reference price, trigger and nature of the triggered order. A series of parameters are required to fully define a Stop Loss Order, including the reference price, order amount, time period and trigger, etc. Inappropriately trading to trigger or defend Stop Losses or option barriers is prohibited.

Basic Market Definitions

Allocated Accounts

These accounts are opened when a customer requires metal to be physically segregated and needs a detailed list of bar weights and assets. The Client has full title to this metal, with the Dealer holding it on the Client’s behalf as custodian.

Fine Content

Represents the actual quantity of Precious Metals in a bar. For example, a Good Delivery Bar may have a gross weight of 403.775 ounces. If it were of a fineness of say 996.4 fine, the fine Gold content or net weight of Gold would be 403.775 x 0.9964 = 402.321 fine ounces.

Forwards

This could be for a simple purchase or sale of metal for settlement beyond spot, an outright forward or for forward swap transactions. Forward swaps are a simultaneous purchase and sale in which one leg of the transaction is generally for spot value and the other forward, conducted at an agreed differential to the spot leg of the deal. This leads to the terms “borrowing on the swap”, in the case where the spot is purchased and the forward sold, or “lending on the swap” where the spot is sold and the forward purchased, in order to differentiate from leasing metal.

Leases

Precious Metals may be placed on deposit, borrowed, leased or lent on unallocated or allocated terms.

Loco London

Refers to Precious Metals that are physically held in London and comply with LBMA or LPPM Good Delivery standards.

Loco Zurich

Refers to Precious Metals that are physically held in Zurich and comply with LBMA or LPPM Good Delivery standards.

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Settlement and Delivery

The basis for settlement and delivery of the Loco London quotation is for delivery of a standard Good Delivery Bar at the London vault nominated by the Dealer who made the sale.

While settlement or payment for a transaction will generally be in US dollars over an account in a New York bank, delivery of metal against transactions in Gold and Silver are made in a number of ways. These include physical delivery at the vault of the Dealer or elsewhere, by credit to an allocated or unallocated account with the Dealer or through the London Precious Metals Clearing to the unallocated account of any third party.

The basic unit for delivery of Platinum and Palladium

The physical settlement of a Loco London/Zurich Platinum trade is a plate or ingot conforming to the following specifications:

- Weight: minimum permitted weight is 1 kilogram (32.151 troy ounces) and the maximum permitted weight is 6 kilograms (192.904 troy ounces)
- The gross weight of a plate or ingot if expressed in grams should be shown to one decimal place; if expressed in kilograms shown to four decimal places; and if expressed in troy ounces shown to three decimal places. Weights should never be rounded up.
- Fineness: the minimum acceptable fineness is 99.95 per cent.

The physical settlement of a Loco London/Zurich Palladium trade is a plate or ingot conforming to the following specifications:

- Weight: minimum permitted weight is 1 kilogram (32.151 troy ounces) and the maximum permitted weight is 6 kilograms (192.904 troy ounces)
- The gross weight of a plate or ingot if expressed in grams should be shown to one decimal place; if expressed in kilograms shown to four decimal places; and if expressed in troy ounces shown to three decimal places. Weights should never be rounded up.
- Fineness: the minimum acceptable fineness is 99.95 per cent.

Both Platinum and Palladium Good Delivery plates and ingots must conform to the specifications for Good Delivery set by the London Platinum and Palladium Market Association (LPPM).

The London Good Delivery (LGD) Lists

These are the lists, maintained by the LBMA for Gold and Silver, and by the LPPM for Platinum and Palladium, of refiners of Precious Metals whose standards of production and assaying are such that their bars are acceptable in settlement against transactions conducted between LBMA/LPPM members and with their Clients. The lists are widely accepted as the international Benchmark, providing the reliable standard for bars traded and delivered around the world. Assessment of applications for inclusion in the lists, together with their ongoing maintenance, is one of the core functions of the LBMA/LPPM.

The Troy Ounce

The traditional unit of weight used for Precious Metals. One troy ounce is equal to 1.0971428 ounces avoirdupois. The accepted conversion factors between troy and metric are that one kilogram equals 32.1507465 Troy Ounces, and one Troy Ounce equals 31.1034768 grams.

The unit for delivery of Gold

The London Good Delivery Gold Bar. This must have a minimum fineness of 995 parts per thousand and must have a Gold content of not less than 350 and at most 430 fine troy ounces. The gross troy ounce weight is rounded down to the net lowest 0.025 troy ounce interval, but the weight in fine troy ounces is expressed to three decimal places as calculated. Bars are generally close to 400 ounces or 12.5 kilograms.

The unit for delivery of Silver

The London Good Delivery Silver Bar. This must be of a minimum fineness of 999 parts per thousand and, for bars produced after 1 January 2000, weigh between 750 and 1,100 ounces. Bars produced prior to 1 January 2000 must weigh between 500 and 1,250 ounces. The weight of bars must be expressed in multiples of 0.1 of an ounce. Bars generally weigh around 1,000 ounces.

Both Gold and Silver Good Delivery Bars must conform to the specifications for Good Delivery set by the London Bullion Market Association (LBMA).

Unallocated Accounts

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.

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Quoting Conventions

Prices are expressed in US dollars per fine troy ounce for Gold and per troy ounce for Silver. Prices against other currencies or in units of weight other than troy ounces are available on request.

Marketable Amounts

In the spot market, the standard dealing amounts between Market Makers are 5,000 fine ounces in Gold and 100,000 ounces in Silver. The usual minimum size of a transaction is 2,000 troy ounces for Gold and 50,000 troy ounces for Silver, while Dealers are willing to offer competitive prices for much larger volumes for Clients.

In the forward market, subject to credit limits, London’s Market Makers quote for at least 50,000 fine ounces for Gold swaps versus US dollars, and for at least one million ounces of Silver.

Spot and Forward Value Dates

The date agreed between parties for one settlement of a transaction.

Gold and Silver Deposits

Market convention is for the interest payable on loans of Gold or Silver to be calculated in terms of ounces of metal which are converted to US dollars based on a US dollar price for the metal agreed at the inception of the lease transaction. The interest basis for Gold and Silver is a 360-day year.

Interest therefore equals: $B \times (R/100) \times (d/360) \times P$. Where B is ounces of Precious Metals, R is the lease rate, d is the number of days and P is the price of Gold or Silver agreed for calculation of interest.

Outright Forwards and Swaps

Market convention is for forward prices in Gold and Silver to be quoted in interest rate terms on the basis at which a Dealer will borrow or lend metal on the swap.

A Dealer therefore may quote three months forward at, say, 0.40 per cent to 0.50 per cent. This means that he will lend on the swap, i.e. sell spot and buy forward, and pay on the basis of 0.40 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 0.50 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 0.40 per cent and the spot price were, say, \$1265 to \$1265.50, the Dealer would, in accordance with market practice, base the deal at the middle of the spread. They would therefore sell the spot at \$1265.25 and buy the forward at a premium calculated as: $\$1265.25 \times 90/360 \times 0.4/100 = \1.26 . The forward price would therefore equal: $\$1265.25 + \$1.26 = \$1266.51$.

The outright forward purchase price is calculated as the spot bid price plus the forward swap bid and the forward sale price as the spot offered price plus the forward swap offer.

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