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LBMA

Removing the Cloak

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EDITORIAL

BY EDEL TULLY, GLOBAL HEAD OF PRECIOUS METALS SALES, UBS INVESTMENT BANK

Ten years ago, as the Global Financial Crisis took hold, LBMA and LPPM held their first joint conference and, from that successful start, we have hosted many conferences and events together.

A decade on, LBMA and the precious metals markets look very different. The restructuring of the LBMA Board in 2016 strengthened the Association's capabilities and ability to promote its core values of trust, integrity and leadership. Trade reporting, whereby OTC market participants will report trades, is one positive outcome. Not only will it increase transparency for all, thus giving an accurate picture of the size and shape of the market, it will also encourage confidence in the liquidity and efficiency of the OTC market – essential ingredients required when defending or lobbying for or against fresh regulatory change.

2008 was a rollercoaster year for gold. 2018, in comparison, has been decidedly tame – a market out of vogue, as a strong US economy encourages two dominant investor preferences: being long US dollar and long US equities. The physical markets aren't stellar either. But markets move in cycles and gold will have its day again – we're a countercyclical industry after all.

LBMA/LPPM conference is our flagship event and the LBMA Executive along with the Public Affairs Committee spend many hours crafting the programme. Why Boston? Well, a trip State-side was due and where better on the East Coast? New York ticks all the boxes except one – it's too local for many. Boston, home to many institutional investors, has long had an interest in precious metals. It's no surprise therefore that the first three sessions of the conference will focus their lens on macroeconomics, politics and investing. Our keynote speeches – both quite different – will be given by Adam Posen of the Peterson Institute on his global macroeconomic assessment and Raghav Chawla of Fidelity on how crypto currencies and blockchain are changing financial markets.

It's quite handy that the Chairman of LBMA, Paul Fisher, is an ex-central banker as he will bring together Adam Posen, Gabriel Glockler of the ECB, Peter Zoellner from the BIS and Isabelle Strauss-Kahn, formerly of the World Bank, to muse on the topic of *Crash, Reflate, Repeat? Dissecting the Economic (Dis)order*.

I couldn't dodge a role this year and I've the formidable task of moderating the Investor panel, aptly named *Alibaba, Amazon….Gold? Why Should Investors Care About Precious Metals?* with David Chang of Wellington Management, Shayne McGuire of the Teacher Retirement System of Texas and David Seif from Point 72.

Platinum and palladium have regularly been the more interesting metals over the past 12 months. So a line-up that includes Johnson Matthey, General Motors, BASF and Sibanye-Stillwater should lend itself to a very dynamic PGM session.

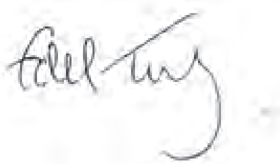
BUT MARKETS MOVE IN CYCLES AND GOLD WILL HAVE ITS DAY AGAIN – WE'RE A COUNTERCYCLICAL INDUSTRY AFTER ALL.

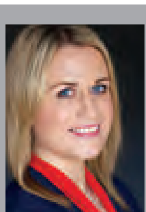
To wake everyone up following the Monday gala dinner, day two will kick off with two keynote addresses. To begin proceedings Mike Silva of the US Financial Services Regulatory Practise will look back at the 2008 Financial Crisis and assess what lessons we've learnt and whether we will see a repeat in the future. He will be swiftly followed by Elaine Dorward-King of Newmont who will be considering the environmental, social and governance developments in the mining industry.

We will stage a rerun of the very popular refining session of last year, as Asahi Refining, Perth Mint, Valcambi and MKS will follow up on some of the challenges, opportunities and threats facing refiners today. Neil Harby, Chief Technical Officer, will deliver his now annual update on the LBMA physical services, while Sakhila Mirza, General Counsel at LBMA, will then chair a panel of experts to discuss the topic of gold bar integrity and explore what opportunities technology can offer the market.

Session 7 will be our effort to go round the world in one hour and delve quickly into key topics including a silver market overview from Heraeus, a China perspective from China Citic Bank and an Indian market update from MMTC-PAMP. Batman and Robin, John Reade and David Jolie, will return to review the conference in the entertaining and insightful way that only they can.

We hope that this conference, for the industry, by the industry, will provide a platform for debate, and an opportunity to deepen old relationships and, importantly, build new ones.





Dr Edel Tully is a Managing Director and UBS Investment Bank's Global Head of Precious Metals Sales. Edel is a member of the LBMA Board and is the outgoing chair of the Public Affairs Committee, a role she held for 10 years.

INSIDE THIS ISSUE

The front cover image is taken in the Banque de France gold vault and is reproduced here by kind permission of the Banque de France.

Banque de France and Gold: Past and Future

BY SYLVIE GOULARD, DEPUTY GOVERNOR, BANQUE DE FRANCE

The Banque de France has always been a major player in the gold market. Since its creation in 1800, the Banque de France has held one of the largest gold and silver reserves in the world. The Napoleon (20 franc gold coin) was one of the iconic coins of the 19th and 20th centuries. It was on par with the British Sovereign and the American Eagle.

In the 19th century, Paris was a major gold centre (for incoming gold from Australia, South Africa, the United States, Russia, etc.). It co-operated closely with other central banks and notably with the Bank of England and the London market (see the cartoon from Punch 1860 on page 5).

Napoleon 20 franc gold coin.

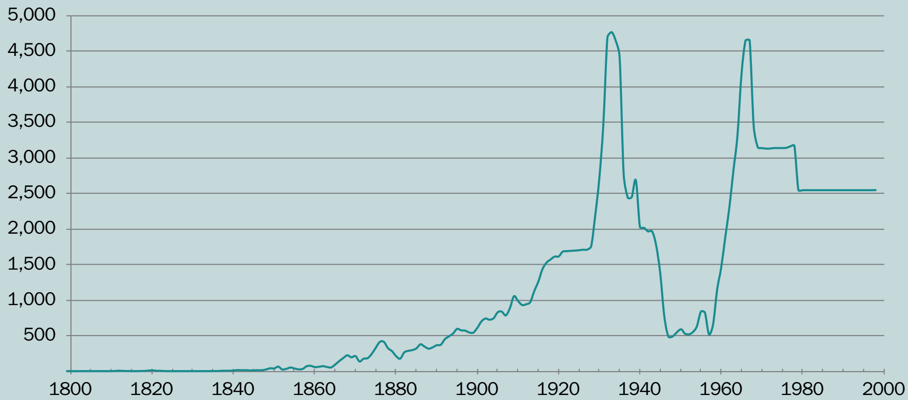
'LA SOUTERRAINE': THE CONSTRUCTION OF THE VAULT

During the gold standard period, gold balances were mainly settled in Paris, London or New York. The Banque de France kept its gold in vaults located under its head office in Paris. Up until the First World War, the gold reserves were stored in the former wine cellar of the Hôtel de Toulouse. However, following the war and the bombing of Paris, the French authorities realised that this was not a very secure location and decided to build a larger, deeper gold vault.

Between 1924 and 1927, 1,200 workers laboured night and day to construct the famous *Souterraine*. Built 29 metres below the level of the River Seine, this huge underground vault covers an area of 10,000 square metres (100m x 100m) and is supported by 720 pillars. The Austrian novelist and playwright Stefan Zweig asked the Governor of the Banque de France to grant him the privilege of visiting the *Souterraine*. After his visit, he published a short story in the Neue Frei Presse retracing his steps which is described on page 7. It became and still is the deepest and largest gold vault in the world.

BETWEEN 1924 AND 1927, 1,200 WORKERS LABOURED NIGHT AND DAY TO CONSTRUCT THE FAMOUS SOUTERRAINE.

The vault was state of the art for its time, with its own autonomous power supply, and was regularly upgraded to incorporate the latest technology. In the 1930s, it was fitted with an air filtering system and an independent oxygen supply. Ten years later, it was awarded the international prize for subterranean architecture.



THE 'GOLDEN AGE' OF PARIS BETWEEN THE TWO WARS

In the 1930s, when the UK went off the gold standard and the US dollar was hit by the Great Depression, the French franc remained the only major currency in the world still linked to gold and effectively convertible into gold. This prompted major incoming flows of gold into France. The Banque de France's gold reserves reached their highest ever level, at 5,000 tonnes.

After the Second World War and the introduction of the Bretton Woods system, the centre of gravity for gold shifted to Fort Knox and to the dollar, which was deemed to be "as good as gold".

As the French franc gradually recovered some of its lost splendour, the Banque de France's gold reserves began to increase again, returning almost to their 1932 level in the 1960s. Today, Banque de France is the fifth-largest holder of gold, with 2,436 tonnes as of September 2018.

After 1971 when President Richard Nixon decided to end the dollar's convertibility, gold lost its monetary role. Then came a slow decline and, by the time of the 2008 financial crisis, gold had become an ordinary metal commodity. The financial crisis acted as a wake-up call for gold – investors lost confidence in financial assets and wanted real, physical assets. This proved to be an opportunity for gold and for the Banque de France.

1940's

the vault was awarded the international prize for subterranean architecture.

MUTUAL ACCOMMODATION.

Madame La Banque and the Old Lady of Threadneedle Street.

ACTIVE GOLD CUSTODY POLICY

Since 2009, the Banque de France has been engaged in an ambitious programme to upgrade the quality of its gold reserves. The target is to ensure that all its bars comply with LBMA standards so that they can be traded on an international market.

In order to implement this upgrading strategy effectively, the Banque de France controls all stages of the process, from transportation to melting and/or refining, through to verification at the refinery.

This close monitoring is crucial in order to understand all the steps involved and analyse any weight gaps that might trigger accounting adjustments. The Banque de France has gained in efficiency over time. Initially, it only carried out the 'melting' process, but since 2014, the policy has evolved to include the 'refining' of all the materials to 999.9 fineness.

5th largest

Today, Banque de France is the fifth-largest holder of gold, with **2,436 tonnes** as of September 2018.

As well as upgrading its stock, the Banque de France is taking various other steps to ensure it meets LBMA criteria. All large bars are weighed on electronic scales which allow the Banque to check that the weight meets the LBMA standards for accounting purposes. The renovation of the historical vaults housing the gold reserves has nearly been completed: the floor will be able to support heavy forklift trucks, and intermediary shelves have been inserted between the existing shelves to ensure the gold is only stacked five bars high, making handling easier. Other storage facilities will be available soon: either strong rooms for storing bare bars on shelves or large vaults to store sealed pallets, facilitate handling, transportation and auditing. By the end of the year, a new IT system will be in place to improve our ability to respond to market operation needs and other custody services.

GOLD SERVICES FOR RESERVE MANAGERS

Since the 2008 financial crisis, there has been renewed interest in gold from reserve managers. Indeed, gold confirmed its status as a safe haven and also emerged as a very good asset for diversification, given its low correlation to other asset classes.

Building on its long experience in managing its gold reserves, in 2012, the Banque de France began to extend its range of gold services to reserve managers. In addition to offering custody of physical gold in its vault in Paris, the Banque de France can buy and sell gold on the spot markets for its institutional customers, using its execution expertise. It can also offer gold swaps either for the purpose of using gold as collateral for deposits, which has been happening more and more since the Basel III framework recognised gold as eligible collateral, or for the purpose of raising foreign currency cash against gold. Finally, foreign central banks can engage in gold lease transactions with the Banque de France as principal, in order to increase the return on their gold holdings without increasing their counterparty risk. Demand for gold deposits for maturities from one week to one year picked up when interest rates went below zero for a number of reserve currencies, thereby prompting central banks to look for alternative sources of return.

THE TARGET IS TO ENSURE THAT ALL ITS BARS COMPLY WITH LBMA STANDARDS SO THAT THEY CAN BE TRADED ON AN INTERNATIONAL MARKET.

While these gold investment services have until now only been offered from London, it recently became possible for the Banque de France to offer them also from Paris, thanks to a partnership with a large commercial bank that is active in the gold market. As a result, with the improvements in the Banque de France's vaults, and the innovations in its service offering, Paris could gradually re-emerge as a key marketplace for gold.

To perpetuate traditional activities while being a key player of the eurosystem illustrates the ambitions of the Banque de France.

Sylvie Goulard, Second Deputy Governor of the Banque de France.

Born in 1964, Sylvie Goulard holds a law degree from the University of Aix-en-Provence (1984). She then graduated from the Institut d'études politiques in Paris (1986) and the Ecole nationale d'administration (1989). Upon leaving the ENA, she worked at the Ministry of Foreign Affairs (Legal Affairs Directorate, then the Centre for Analysis and Forecasting) and at the Conseil d'Etat. She has been an associate researcher at Sciences Po's Centre de recherches internationales (CERI). Between 2001 and 2004 she was political adviser to the President of the European Commission, Romano Prodi. From 2004 to 2006, she taught at Sciences Po Paris, in the framework of the joint degree course with the London School of Economics and the College of Europe in Bruges.

From 2009, she devoted herself to her mandate as MEP. As a member of the Alliance of Liberals and Democrats for Europe (ALDE) group, she sat on the Parliamentary Committee on Economic and Monetary Affairs (ECON) where she served as coordinator/spokesperson for the ALDE group.

She was rapporteur or co-rapporteur for various legislative texts notably on:

- European financial supervision (creation of the systemic risk committee and of supervisory authorities for the banking and insurance sectors and for financial markets);
- reform of the stability and growth pact/euro area governance ("6 pack", "2 pack");
- banking union (creation of the Single Supervisory Mechanism; creation of the Single Resolution Board; bank structural reforms; deposit guarantee fund);
- solvency rules for insurers;
- the Common Consolidated Corporate Tax Base

She was also rapporteur for two own-initiative non-legislative reports on eurobonds and the role of the EU in global finance, and a member of temporary commissions on the financial crisis and tax matters (following LuxLeaks and the Panama Papers). From 2010 to 2017, she chaired the European Parliament Intergroup against Extreme Poverty.

She served as Minister of the Armed Forces (May-June 2017) in the first government of Édouard Philippe.

Sylvie Goulard is the author of L'Europe pour les Nuls (2007), De la démocratie en Europe (2012), co-written with Mario Monti, Europe, amour ou chambre à part? (2013), Goodbye Europe (2016).

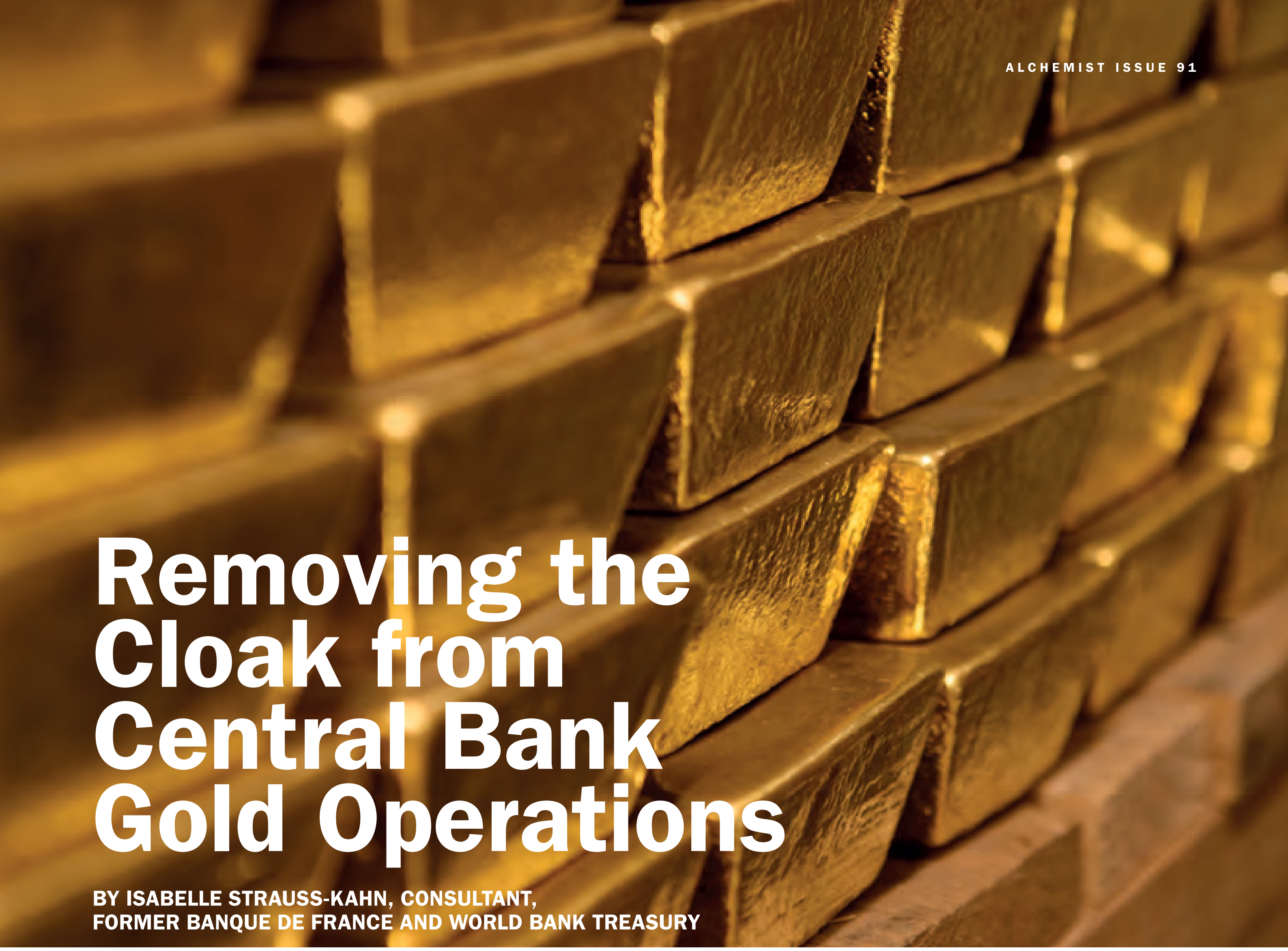
A Visit to the Banque de France Vaults

The Austrian novelist and playwright Stefan Zweig asked the Governor of the Banque de France to grant him the privilege of visiting the Souterraine. After his visit, he published a short story in the Neue Frei Presse retracing his steps and transforming what could have been an ordinary visit to a central bank vault into an adventure akin to Jason's quest for the Golden Fleece:

A hall as big as a church or a theatre, the ceiling supported by hundreds of short, sturdy cement columns, a forest of stone columns reminiscent of the mosque in Cordoba or the temple in Madras carved into the rock; only, whereas those shimmer dark and mysterious, this hall is filled with light and is therefore seven times as mysterious in its perfect emptiness…

The technologically most up-to-date, most remarkable and currently most important building in Paris is, strange as it may seem, entirely invisible from the outside. Every day, thousands, nay tens of thousands of people walk past it without a glance: they walk along the narrow Rue Montpensier or along the Rue des Petits Champs and do not notice anything other next to the old, imposing building of the Banque de France, the erstwhile Hôtel de La Vrillière, than a large empty, square, flat area, fenced in by boards, apparently just a building site awaiting workmen and their orders. In reality, the building has long been completed. Only this remarkable construction, this armoured casemate, this fortress is not raised up as elsewhere with steeply climbing walls on its ground beams but is invisibly buried six storeys deep below the ground.

Beneath this innocently empty, sandy site in the middle of Paris lies pressed within steel and cement the mightiest goldmine of our modern world; down here, the famous underground vaults of the Banque de France stretch out undreamt-of and mysterious with today seventy and soon perhaps eighty billion, that is to say, with seventy or eighty thousand million francs-worth of minted or unminted gold, a physically unimaginable quantity, and in any case a hoard the like of which has been seen by neither Caesar nor Croesus, Cortés nor Napoleon, nor any of this world's emperors and dynasties nor any mortal since the beginning of time. Here in this mysterious place is the geometrical point about which the whole of the economic universe turns in agitated circulation. Here the magical metal from which all of the world's troubles springs sleeps its dangerously motionless and at once magnetic sleep.



Removing the Cloak from Central Bank Gold Operations

BY ISABELLE STRAUSS-KAHN, CONSULTANT, FORMER BANQUE DE FRANCE AND WORLD BANK TREASURY

Four periods of the gold market, when I worked at the Banque de France (BdF) and the World Bank, strike me the most. They all relate to what Stefan Zweig, writing in 1932 about a visit to the gold storage under the BdF, called poetically *"the epicentre of invisible waves that shake stock exchanges and banks".*

MARKET RUMOURS

The first period, in the mid-90s, illustrates perfectly Zweig's metaphor. In 1995, I was invited to speak at a conference in New York organised by an investment bank. The price of gold was around $380 per ounce at the time and the market was quite bearish. My speech was not controversial and presented the stance of the BdF as a big and conservative holder of gold, but it triggered passionate reactions and debates within the audience. I could feel the anxiety and opposing views of producers and investment banks, which were all scrutinising central banks' behaviour. Some were even accusing the authorities of manipulating the market.

THE SALE PROCESS USED BY THE BOE CERTAINLY COULD NOT BE ACCUSED OF OPACITY, BUT THE UK SALES HAD A HUGE IMPACT IN DIFFERENT WAYS.

In 1998, Frank Venoroso published the *Gold Book Annual*, questioning the accuracy of the widely respected and independent (GFMS) gold statistics. Rumours abounded – even those of conspiracy. Needless to say, these irrational times made for a very interesting start for me in the international gold market!

SALE OF UK GOLD RESERVES

The second period began on 7 May 1999, when Gordon Brown, Chancellor of the Exchequer, announced the sale of more than half of the UK's gold reserves in a series of auctions to be operated by the Bank of England (BoE). The price of gold was then $282.40. By the time of the first auction, the gold price had dropped by 10% and ultimately reached a low point of $252 on 20 July. This price reaction was actually not so surprising in a market which was dominated by quite substantial short-selling positions. The sale process used by the BoE certainly could not be accused of opacity, but the UK sales had a huge impact in different ways:

- The sales exacerbated the fear that some big gold holders, especially European central banks, would follow and the price of gold would collapse. Indeed, the Swiss National Bank (SNB) had started to modify its legal framework in order to be allowed to sell gold prior to Gordon Brown's announcement. In June 1999, the SNB decided that half of its 2,590 tonnes of gold reserves were no longer required for monetary purposes. There also were discussions about the IMF selling part of its gold holdings. Furthermore, with the introduction of the euro, intense political debate was spurred as to whether national central banks had to keep on holding so much foreign reserves, both in currencies and in gold. The argument was that the ECB had already been endowed with reserves and the euro was replacing national currencies. I remember having written several memoranda to counter multiple requests from parliament and government members to sell reserves and return the proceeds to the government, which would have been a breach of the principle of non-monetary financing enshrined in most laws of central banks.

- In this context of uncertainty, the first Central Bank Gold Agreement (CBGA) was signed in Washington DC on 26 September 1999[1]. The ECB, comprising 11 national central banks from the euro area, as well as the Swedish, Swiss and British central banks, signed the statement. Even if not part of the Agreement, the Fed and the Bank of Japan implicitly endorsed the aims.
- True, the Agreement took the market by surprise and financially hurt some participants – those who had sold gold short as well as the producers who had initiated quite major hedging programmes in the belief that the gold price could only go one way, meaning downwards.
- The reasons behind the CBGA are, in my view, two-fold. First, the UK sales evidenced that central banks were in a prisoner's dilemma situation: they would be better off cooperating, not only in their own interests but also by allowing a more efficient functioning of the gold market. However, I remember that central banks' opinions about the impact of their operations were far from consensual. In 2000, the European System of Central Banks set up a working group to write a report on the gold market. I chaired that panel. The debates we had were very lively: the question of whether gold lending by central banks had a negative impact on the spot gold price divided us. I was among those arguing that, in the context of the gold market at that time, gold lending by central banks did have a depressive impact on the gold price. This concern explains why the CBGA specifically stated that there was to be a block on increasing gold leasing and the usage of futures and options. The second reason behind the Agreement was the recognition of the unique position of central banks in the market as a major player and, more importantly, as a significant holder of gold. Being transparent as to their intentions would stabilise the market by reducing uncertainty. But in no way, as some intimated, was there an intention to manipulate the gold price. The initial CBGA, and the subsequent versions, fully achieved these objectives, in my opinion.

I WAS AMONG THOSE ARGUING THAT, IN THE CONTEXT OF THE GOLD MARKET AT THAT TIME, GOLD LENDING BY CENTRAL BANKS DID HAVE A DEPRESSIVE IMPACT ON THE GOLD PRICE.

BANQUE DE FRANCE GOLD SALES

The third milestone in my gold market experience corresponds to the gold sales by the BdF, which I had the privilege to conduct as Director of Market Operations in the mid-2000s. The price of gold was then around $400 per ounce. This programme was determined in full compliance with the second CBGA signed in March 2004. It took the form of an agreement between the BdF and the French Treasury, which was signed on 19 November 2004. This agreement stated in particular that there would be no direct payment of the proceeds (not even the profits) to the French government. Only the return on the reinvested proceeds were to go to the Treasury via the dividend. The main reason behind the sales was to enhance the risk/reward profile on the whole reserves portfolio.

From an operational perspective, the sales programme was a great opportunity to increase our knowledge of the gold market in all its facets:

- The sale strategy was decided at the highest level. In order to be fully accountable vis-à-vis the stakeholders, the decision of using the London Fixing as a benchmark was made – with the aim of beating the benchmark of course. That is why, gradually, more instruments were used such as options, which required setting up the whole operational framework to process these transactions (legal contracts, front office, risk management and back-office procedures).
- Shipping and refining: part of the BdF gold holdings was London Good Delivery (LGD), and hence easy to sell, but part of it was not. Thus, it was necessary to refine some non-LGD gold.

Inside the Golden gallery of the Banque de France @ Banque de France Pascal Assailly.

- Sometimes BdF found it useful to employ location swaps and thus to fully understand the characteristics of that market.

BEATING THE BENCHMARK

This was a very exciting period from which I draw two lessons. First, beating the benchmark is not easy; second, the diversification impact can be evaluated by the fact that gold represented 17% of the assets of the balance sheet in 2004, 11% in 2009 (and 8% in 2017, partly because of the resort to unconventional monetary policy operations).

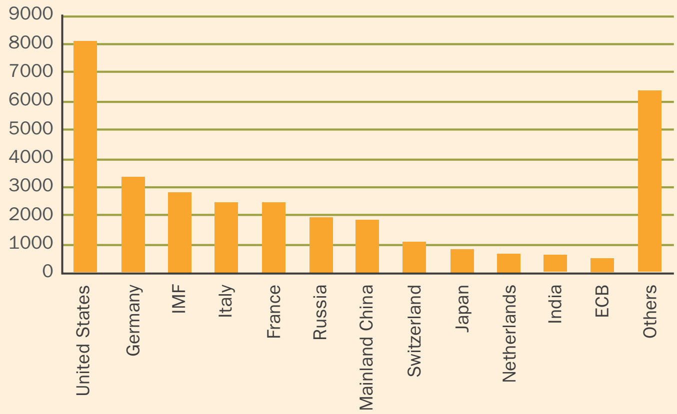
The fourth and last period is more recent. I was no longer involved in the operational aspects of the gold market, but I provided technical assistance in reserve management on behalf of the World Bank Treasury and had contacts with many central banks. I would like to highlight two main observations:

- Central banks still do consider gold as a reserve asset which is useful to hold. I have seen a lot of central banks keeping a very

1. South Africa was the top gold-producing country in the world until 2006 and presently ranked seventh.

Isabelle Strauss-Kahn is a consultant, expert in financial issues, particularly governance, policies and asset management. She worked at the World Bank Treasury (Lead Financial Officer: 2008-2018), the Banque de France (Market Operations Director: 2003-08; Deputy: 1999-2003; Head of Risk Management: 1995-99) and the Bank for International Settlements (Head of Middle Office: 1990-95). She has participated in various technical assistance missions with the International Monetary Fund, the World Bank and the Banque de France. She has been a member of numerous international committees, a speaker in many conferences and has written articles on reserve management. She received her MBA in France and graduated in Economics at the University of Chicago. She is a Board member of non-profit organisations.

WORLD OFFICIAL GOLD HOLDINGS TONNES (SEPTEMBER 2018)



Source: IMF International Financial Statistics

GOLD PRICE – US DOLLARS

Based on the pm LBMA gold price at end month.

small portion in gold, but they want to keep it even if it does not pay back a high return and contravenes the pure principles of an asset allocation exercise.

- Transparency remains vital for markets. Interest in central banks' reserve operations in gold surges from time to time, especially when China and Russia are supposed to be active. The various rounds of CBGAs have been quite helpful in promoting an increasing transparency of central banks' activity in the gold market and in dispelling rumours that central banks are somehow interested in manipulating its price. Furthermore, more and more central banks are subscribing to the IMF Special Data Dissemination Scheme template where they declare their gold holdings (PBOC is one of those).

In conclusion, while central banks may not disclose everything and must preserve some mystique, as evoked by Stefan Zweig, they should be as open and transparent as possible, and should not seek to be shrouded in mystery just for the sake of it.

RECESSION, RATES & THE US RETAIL INVESTOR

BY SUKI COOPER, PRECIOUS METALS ANALYST, GLOBAL RESEARCH, STANDARD CHARTERED BANK

US retail investment demand has diverged from the heightened demand in Asia and stable demand in Europe, but will it continue?

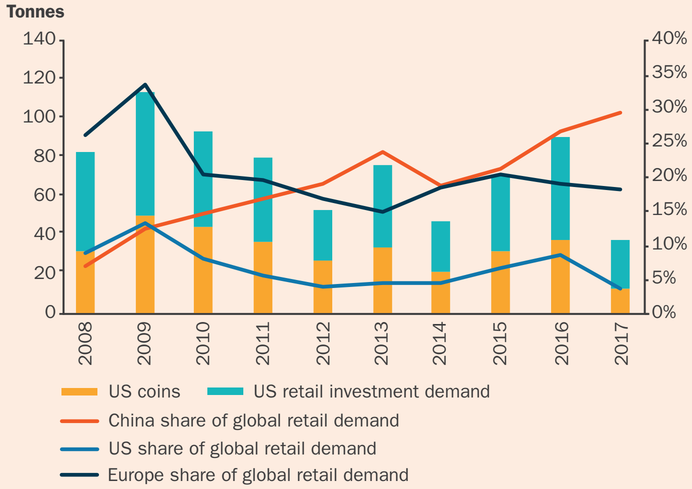
OPPOSING MARKET VIEWS DRIVE US RETAIL INVESTMENT DEMAND FOR GOLD AND SILVER TO EIGHT-YEAR LOWS

We believe the chief culprit behind gold's inability to trade meaningfully above $1,350/oz and silver's above $18/oz, over the past couple of years is the absence of the retail investor. Retail demand in the US has more than halved over the past decade and, in 2017, global retail investment demand in both gold and silver fell to levels last seen in 2009, and it remains in the doldrums. Meanwhile, gold prices have recently tested lows last seen in early 2017 and silver has tested early 2016 lows.

However, we note over the last ten years, retail investment demand has grown by more than one-third in Asia, led by more than a trebling of demand in China, and has been broadly stable in Europe. US gold retail demand is important because it is indicative of market sentiment, despite making up a small share of global demand,; for silver, US investors accounted for 40% of global retail demand at its peak, and over 10% of total global demand.

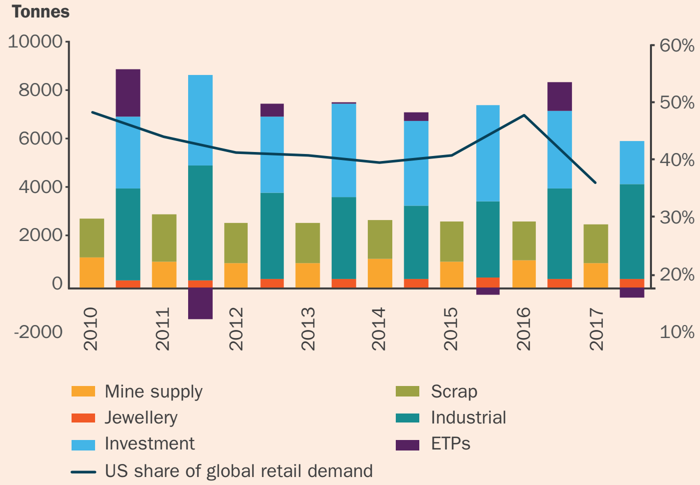
US gold coin sales fell by two-thirds in 2017 and silver coin sales by half, to their lowest levels since 2007. For the year to date, gold is down a further 3% year on year and silver is down 29% year on year. Speculative positioning in gold has swung into net short territory and is at its lowest position since 2001, while net short speculative positioning in silver has hit record lows in 2018.

US RETAIL INVESTMENT DEMAND FELL BY ALMOST 60% Y/Y IN 2017



Source: Metals Focus, GFMS, Standard Chartered

SILVER RETAIL INVESTMENT DEMAND ACCOUNTED FOR ALMOST HALF OF THE GLOBAL SHARE AT ITS PEAK



Source: Metals Focus, Standard Chartered

Physically backed gold ETF holdings are around one-fifth below their peak reached at the end of 2012, while silver holdings are around 10% shy of their peak reached only last year. While gold ETF flows have swung to net redemptions in 2018, silver ETFs are still up for the year to date. Gold tends to outperform when it garners support from broad-based investment demand. The broader investment picture has wilted over the past year, with the US retail investor continuing to take a backseat.

SILVER ETF HOLDINGS HAVE A GREATER SHARE OF RETAIL INVESTORS THAN GOLD, WHERE THE MAJORITY ARE INSTITUTIONAL INVESTORS.

THE GLOBAL PICTURE REVEALS POCKETS OF STRENGTH

As geopolitical and political tensions escalate, gold's safe-haven status continues to be debated. It could be argued that numerous risks should have reignited a flight to safety in gold; namely, risks surrounding Brexit and subsequent European elections threatening the status quo; imposition of sanctions on Iran; tensions across the Middle East and Korea; heightened trade tensions; and uncertainty surrounding the Trump administration. Instead, the US dollar has benefitted, and in turn weighed on gold.

Outside of the US, global tensions have been perceived as a significant but not a systemic risk, and not sufficient to threaten the global economy yet. Indeed, one-month implied volatility has tested record lows over the past couple of years. Meanwhile, gold has benefitted from localised demand, and the appetite to buy gold in countries such as Germany remains healthy and has grown over the past decade as new markets such as in China have been developed.

THE US RETAIL INVESTOR VIEW

Precious metals analysts have the opportunity to speak to a range of investors around the world, and US retail investors have been singing a different tune to the rest of the world for the past two years.

Individual investors and private wealth managers had assumed a much more upbeat view of the US economy compared to consensus and, on numerous occasions, investors called for much higher interest rates than the Fed funds futures curve implied. An optimistic outlook on equity markets led those who had a preference for natural resources to express their views through gold and silver stocks rather than the underlying commodity. Many individual investors found renewed political confidence in the Trump administration and felt little need to seek a safe haven. Coupled with range-bound gold and silver price action, and in some instances market saturation, investors shunned the refuge offered by precious metals. While cryptocurrencies dominated the headlines, there was little material evidence that it had cannibalised gold demand.

OUR BASE-CASE SCENARIO IS THAT WE ARE UNLIKELY TO SEE A RECESSION IN 2019 IN THE US.

WILL US RETAIL INVESTOR DEMAND REMAIN FRAGILE?

US silver coin sales and US retail demand both marked their strongest year in 2015, whereas US gold coin sales peaked in 2009, but US investor demand picked up in 2010 and 2016 according to MetalsFocus. Price expectations play a significant role in driving investment demand but so do the macro-environment and market conviction.

What happens next is likely to be driven by (1) the resilience of physical ETF holders; (2) the risk of recession; and (3) how gold fares in an environment of US interest rates above 2%.

HOW 'STICKY' IS THE RESILIENT INVESTOR?

The silver ETF investor has proved to be resilient even during periods of weak price performance, whereas gold ETF investors tend to manage loss-making exposure on a more timely basis. This is partly driven by the type of investor holding the two ETFs.

Silver ETF holdings have a greater share of retail investors than gold, where the majority are institutional investors. More than two-thirds of the silver ETF holdings were acquired at prices trading above $15/oz and holdings peaked in July 2017. Metal held in trust in the largest US (and the largest globally) ETF, iShares Silver (SLV), peaked in Q3 2016. However, a closer look at its prior peak when silver prices closed in on $50/oz in 2011 reveals the resilience of silver ETF investors.

The top 15 holders of SLV represented 10% of global silver ETF holdings and 18% of SLV in 2011. Those same holders maintain a 9% share of SLV today, but only 5% of the global market share. Two of the top 15 maintain a larger exposure to silver than they did seven years ago and four have exited their positions entirely. Overall, they maintain half of their peak exposure. Today's top 15 holders represent 7% of global holdings and 12% of SLV.

In contrast, at its peak in December 2012, metal held by the top 15 investors in GLD, the largest gold ETF globally and in the US, represented 17% of global holdings and one-third of GLD. Today, these investors represent 7% and 19% of global and GLD holdings, respectively. Three investors maintain a larger holding today than they did at the peak and two have no exposure at all.

We can deduce two trends from this data. First, that the silver ETF has a lower concentration at the institutional level and emphasises the more retail-heavy exposure in silver. Second, and perhaps more importantly, the majority of investors still maintain some exposure to precious metals, albeit smaller in most cases, underscoring the resilience of ETF investors.

BUT NOT ALL INVESTORS ARE EQUAL

While silver ETF investors are prepared to hold on to a loss-making position for longer, gold investors are more likely to liquidate loss-making exposure, suggesting an element of tactical positions. Notably, prices trading below $1,200/oz for the first time since early 2017 meant that more than 200 tonnes of holdings accumulated since the start of 2017 moved into loss-making territory, pressuring prices to the downside in the near term.

WILL THE RISK OF RECESSION SPARK RENEWED INTEREST IN GOLD?

There has been much discussion that an inverted US yield curve is a precursor for a recession. While gold has broadly tended to outperform during periods of negative growth (silver's industrial exposure has resulted in a weaker price performance), our base-case scenario is that we are unlikely to see a recession in 2019 in the US. We forecast US GDP growth to slow to 2.6% in 2019 (from 2.9% in 2018), EUR-USD to close 2018 at 1.15 and 2019 at 1.20. We expect that US inflation will not rise much above 2% and the US Treasury yield curve will flatten to 0 bps by the end of 2018.

While market positioning suggests that a steeper US yield curve could be led by the long end, we think the curve will start to steepen only once the market believes the Fed is close to the end of its rate-hiking cycle and starts to hint at cutting. We believe the curve is likely to flatten/remain flat for the coming quarters, in turn suggesting a 'steady as she goes' economy and that less stimulus will be needed as conditions improve. However, the market is currently pricing in fewer hikes for 2019 than the Fed funds futures curve is implying, and anticipation that the hiking cycle is drawing to a close may be sufficient to reawaken retail interest in gold.

CAN GOLD PRICES GAIN TRACTION IN A RISING RATES ENVIRONMENT?

Interest rates are still relatively low, but gold prices have gained upward momentum in an environment where the market believes the Fed will soon approach the peak of the hiking cycle. Escalating trade tensions have given cause for concern over rising inflation: while a 10% tariff could be absorbed by the market, a 25% tariff is likely to push inflation higher.

Gold tends to perform well as an inflation hedge if it is bought before inflation picks up and during prolonged periods of high inflation. In the 1970s and 1980s, gold consistently outperformed during periods when core PCE inflation rose above 5%, with annualised returns of 16%-24%. When core PCE reached 2%-5%, gold's performance was patchier, with negative returns in some periods and strong outperformance in others. During periods when US CPI inflation rose above 2%, an average annualised return of 6% masked volatile performance ranging between -28% and +23%.

WE MAINTAIN OUR POSITIVE OUTLOOK FOR GOLD PRICES AND EXPECT THEM TO TRADE TOWARDS $1,300/OZ OVER THE COMING MONTHS.

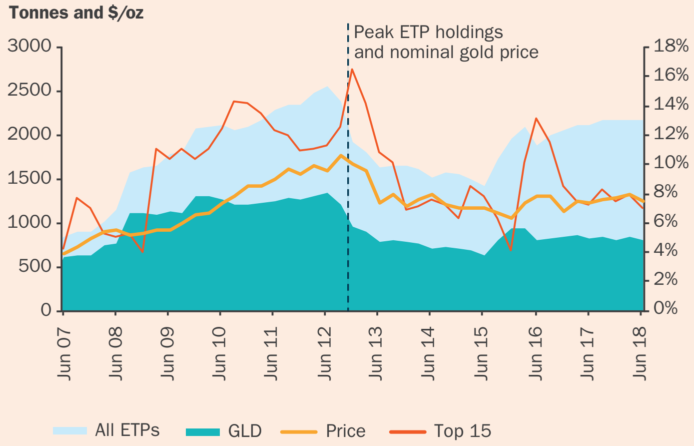
While the potential for the Fed to continue hiking in 2019 is a significant headwind to gold, the low US unemployment rate and rising inflation are supportive, perhaps more so if the Fed falls behind the curve and does not hike rates fast enough to keep pace with inflation.

US RETAIL INVESTMENT DEMAND COULD TURN A CORNER NEXT YEAR

We maintain our positive outlook for gold prices and expect them to trade towards $1,300/oz over the coming months. The physical market should offer a better cushion for prices at more attractive entry levels, the Fed should enter the final stages of its hiking cycle and central banks remain net buyers of gold. We believe the drag from the strengthening US dollar should start to fade towards the end of the year and view the dollar as overvalued, with cyclical factors and global risk aversion providing support; therefore it may not weaken until capital returns to emerging markets.

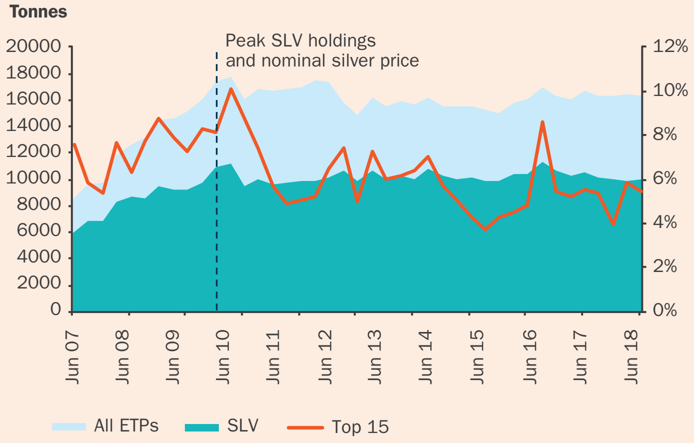
The scope for short covering activity poses an upside risk to gold and silver prices, given the extreme short positioning. Importantly, in our view, the US retail investor is likely to reinvest in gold as the low-hanging fruit in other markets dwindles, particularly if the US equity market softens and the market starts to anticipate a weaker US dollar and rising inflation. Indeed, gold coin sales have started to pick up, albeit from a low base.

THE LARGEST GOLD ETP INVESTORS STILL MAINTAIN AN EXPOSURE TO GOLD



Source: Various ETPs, Bloomberg, Standard Chartered.

THE LARGEST SILVER ETP DOMINATES MARKET SHARE BUT IS LESS CONCENTRATED



Source: Various ETPs, Bloomberg, Standard Chartered.

GOLD TENDS TO BROADLY OUTPERFORM DURING RECESSIONARY PERIODS

Rate hiking cycles	Annualised gold return	Annualised silver return	Recessions	Annualised gold return	Annualised silver return
Current hiking cycle	5%	1%	2007	7%	**-5%**
2004-2006	23%	37%	2001	10%	**-4%**
1999-2000	6%	**-3%**	1990	**-7%**	**-30%**
1994-1995	**-3%**	**-14%**	1981	5%	9%
1988-1989	**-16%**	**-11%**	1980	**-12%**	**-80%**
1986-1987	26%	62%	1973	61%	33%
1983-1984	**-15%**	**-30%**			

Source: Bloomberg, Standard Chartered.

Suki Cooper, Precious Metals Analyst, Global Research, Standard Chartered Bank. Suki is based in New York and covers the markets for gold, silver, platinum, palladium and other platinum-group metals, along with the key producing countries and consuming sectors. She joined Standard Chartered in 2015 from Barclays, where she spent 11 years, most recently as Head of Metals Research. Previously, she was a Chartered Accountant at PriceWaterhouseCoopers. She is a member of the Public Affairs Committee of LBMA, and regularly features in the media. She is an ACA Fellow of the Institute of Chartered Accountants in England and Wales.

BULLION **REDEFINED.**

THE MOST SECURE BULLION COIN WORLDWIDE NOW FEATURES THE WORLD'S FIRST AND ONLY ADVANCED SURFACE PROTECTION.

Every Silver Maple Leaf bullion coin from the Royal Canadian Mint dated 2018 and later now features MINTSHIELD™ surface protection, the world's only proven technique for significantly reducing the appearance of white spots on silver bullion coins. Combined with the Royal Canadian Mint's market-leading BULLION DNA™ anti-counterfeiting technology, micro-engraved laser marking and radial lines, Silver Maple Leaf coins now offer even stronger protection for your bullion investment.

WWW.MINT.CA/MINTSHIELD

LBMA NEWS

RESPONSIBLE SOURCING INITIATIVES

On 1 January 2019, version 8 of the RGG will be launched to expand the scope of the guidance to include environmental and social issues, and strengthen the interaction with producers further up the supply chain.

Following close consultation with the LPPM, the Responsible Platinum and Palladium Guidance was launched in early August and will become effective from 1 January 2019.

100 CENTENARY OF THE FIRST GOLD FIX

On 12 September 1919 the Bank of England made arrangements with NM Rothschild & Sons for the formation of a free gold market and the establishment of a daily gold price, which became known as the "gold fix". To celebrate the centenary of this historic occasion, LBMA is proposing to arrange an event in London towards the end of 2019. LBMA is also contemplating arranging an exhibition and would welcome the support from members in this respect and/or would be open to other ideas and suggestions as to how we could mark this momentous occasion. Please get in touch with LBMA Executive at: events@lbma.org.uk

2018 LBMA CHARITABLE DONATIONS

LBMA would like to invite members to nominate charities that could benefit from the annual fund that the LBMA sets aside each year for charitable donations, particularly those charities that members may be directly associated with. LBMA usually splits the fund between more than one charity. Please send your nominations by 9 November to: mail@lbma.org.uk

100 ACCREDITED REFINERS

We now have 100 refiners on the Good Delivery Lists, with 68 listed for gold, 83 listed for silver and 51 refiners on both lists.

CURRENT APPLICATIONS

There are currently 10 active Good Delivery List applications.

LBMA MEMBERS

We currently have 145 member companies – 89 Full Members (including 13 Market Making Members and three Exchange Affiliates) and 56 Associates located in more than 30 countries.

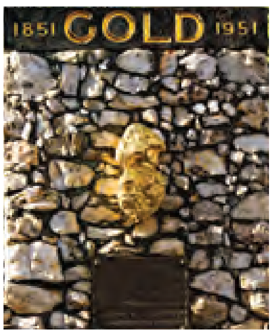
Any companies including refiners, miners or central banks that may be interested in applying for membership are invited to contact the LBMA Executive at: mail@lbma.org.uk.

Gold and Silver Held in London Vaults

As at end June 2018, there were 7,684 tonnes of gold, valued at $308.9 billion and 34,901 tonnes of silver valued at $18 billion. This equates to approximately 614,712 gold bars and 1,163,365 silver bars.

GOLDEN NUGGETS DISCOVERED

The article in Alchemist 89 ('Golden Cities of the World – Ballarat'), featured reference to the 'Welcome Stranger' (pictured), the largest golden nugget ever discovered.



More recently in September 2018, two nuggets weighing 2,300 oz and 1,600 oz respectively were discovered near Perth in Australia. They are estimated to be worth £2 million and £1.5 million.

Musical Chairs

As reported in the last edition of the Alchemist, at the AGM in July, Edel Tully was voted onto the LBMA Board. This prompted an election to replace her as Chair of LBMA's Public Affairs Committee (PAC). Following a vote at the PAC meeting on 19 September, Tom Kendall, Head of Metals Strategy, ICBC Standard Bank, was elected the new Chair. Jon Butler, Precious Metals Strategist & Business Development Manager, Mitsubishi Corporation RtM (Europe), was elected as Vice-Chair. Congratulations to them both.

Tom Kendall, Chair

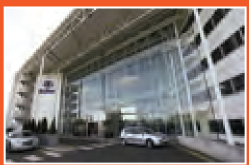
Jon Butler, Vice Chair

We Welcome a **New Member** of the Team

LBMA is delighted that Emily Brough has joined the team as our Events Executive. Emily supports the Head of Communications with the co-ordination of LBMA events, including the conferences, seminars, forums, webinars and social events.

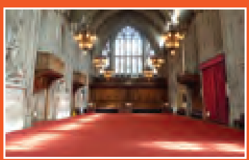
LBMA OUTREACH AND INDUSTRY EVENTS

12-13 November 2018
IPMI European Chapter Seminar, '8 Metals'
Hilton Hotel, Budapest



14-15 November 2018
Electrical and Electronic Equipment and the Environment Conference,
London Hilton, Heathrow, TW6 3AF
www.rina.org/en/media/events/ 2018/11/14/eee-conference

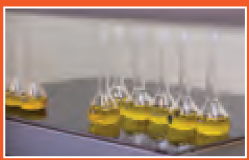
Sakhila Mirza will be speaking at the event on *Tracing Gold in Supply Chains* to explain how to trace metals in supply chains responsibly and the issues faced by the gold sector, how we have addressed them and how we continue to develop LBMA's responsible sourcing programme.



5 December 2018
LBMA Biennial Dinner
Guildhall, London

LBMA would like to organise a seminar on the afternoon of 5 December, prior to the dinner. We would welcome suggestions for speakers and topics. Please email events@lbma.org.uk with your ideas.

5 December 2018
European Precious Metals Federation (EPMF) 'Conflict and Opportunity: Chemical Management, the Circular Economy and Precious Metals'
14:00 to 17:00, Radisson Blue Hotel, Brussels



17-20 March 2019
LBMA Assaying and Refining Conference
The Royal Garden Hotel, Kensington, London

THE CALIFORNIA GOLD RUSH

BY JAMES STEEL, CHIEF PRECIOUS METALS STRATEGIST, HSBC

Other than the Civil War, few historical events of the 19th century in the United States command such interest and captivate the imagination as the California Gold Rush.

The California Gold Rush began with the discovery of significant gold deposits near Sacramento in 1848. It proved to be the first in a series of modern gold rushes in the latter half of the 19th century. The California Rush stimulated such interest in gold that it led to rushes in Australia, New Zealand, South Africa, the Klondike, Alaska and South America over the course of the next 50 years. Only two other rushes in that period however rival California's in size and economic impact – Australia in 1851 and South Africa in 1886. In both cases, the rushes contributed significantly to these territories gaining a greater sense of their independence from Great Britain, eventually leading to nationhood. The rushes occurred in often sparsely populated sections of the globe and, in turn, promoted settlement and economic and political development at a pace that, in the absence of gold, would not have occurred. But it started in California first.

ONLY TWO OTHER RUSHES IN THAT PERIOD HOWEVER RIVAL CALIFORNIA'S IN SIZE AND ECONOMIC IMPACT – AUSTRALIA IN 1851 AND SOUTH AFRICA IN 1886.

Subsequent production levels, especially since 1900, make California's contribution to world gold supply seem modest, but at the time, it was immense. From 1792 through to 1847, cumulative US gold production was only around 37t, according to the United States Geological Service. California's production in 1849 alone exceeded this number – it produced an average of 76t of gold a year in the first decade of the Gold Rush, from 1848 to 1857. Thus each year's output was almost double what the nation mined cumulatively from 1792 through to 1847. Robert Whaples of Wake Forest University estimates that, during that same decade, California's gold production equalled US$550m, nearly 2% of US GDP. Profits were enormous. Early on, claims yielding as much as US$400 in a day were not uncommon, the equivalent of US$12,500 today. Of course, prices also rose: fresh eggs were sold for hundreds of dollars and there were reports in San Francisco newspapers of boots that sold for more than US$2,000. As wind of what prices merchants could command reached the East Coast, goods began to flood into the region, leading to more stable, but still very high, prices.

The Mexican-American war, which was largely fought for control of California, ended on 2 February 1848. According to the terms of the Treaty of Guadalupe Hidalgo, in exchange for US$15m and the forgiveness of US$3.3m in US claims against the Mexican government, Mexico ceded California, New Mexico, Utah, Nevada, Arizona and disputed parts of Texas to the United States. In one of history's ironies, neither side was aware of the discovery of gold just two weeks earlier.


FOR
CALIFORNIA!
DIRECT
EXTRAORDINARY INDUCEMENTS!!
THIRTY-FIVE DAYS TO GOLD REGIONS!
The "California Steam Navigation Co."
STEAM SHIP!
NICARAGUA
On FRIDAY, MARCH 23d, 1849,
200 JACK ASSES!
The Quickest, Safest and Cheapest!!
Price of Passage Through Ninety Dollars!

THE WIDER ECONOMIC IMPACT

The Gold Rush helped develop the state of California. Demand from miners stimulated agricultural production and California became a major exporter of foodstuffs, with San Francisco the commercial and naval hub of the Western Pacific.

Each year's output was almost **DOUBLE** what the nation mined cumulatively from 1792 through to 1847.

Levi Strauss established a jeans manufacturing business in San Francisco aimed at providing miners with working gear, and other manufacturing concerns sprouted up. The Gold Rush also led to the start of modern banking in California, notably but not exclusively by Wells Fargo, which set up the famed pony express to increase mail flow to California. Profits from gold allowed the banks to fund the Central Pacific Railroad in 1861 and thus helped allow for the settling of the continent.

THE GOLD RUSH ALSO LED TO THE START OF MODERN BANKING IN CALIFORNIA.

Economic activity was stimulated around the Pacific as demand for manufactured products, goods and materials rose. US trade with China, Japan, New Zealand and Australia increased noticeably in this period. The Gold Rush had a truly international impact.

LABOUR RULES

The California Gold Rush was an unexpected economic shock of such size and magnitude that it prompted a massive reallocation of labour all along the American frontier, which in turn brought in migration from the American East Coast and around the world. The demand for labour rocketed in northern California. Labour shortages were reported in such diverse places as Germany and Hawaii due to the Rush. In Hawaii, the shortage was so severe that planters began bringing in Chinese and Japanese labour for the first time to harvest sugar cane. Demand for labour was the highest in the world as workers deserted traditional jobs for mining. This combination pushed up the real wages of working men in California by an astounding 500% in the early years of the Rush, from 1848 to 1853, according to Robert Margo in a paper on labour in the California Gold Rush (2000). Wages declined abruptly as mass migration met demand but remained higher than in the rest of the US. Although it occurred over a relatively brief time, the Rush left California wages permanently higher, according to Margo – a phenomenon which continues to this day.

GLOBAL MONETARY IMPACT

The United Sates, like much of the world, was on the gold standard at the time of the Rush, having switched from a bimetallic standard in 1834. The rapid and unchecked increase in the gold supply acted as a positive monetary supply shock to the US. Such a large gold discovery effectively had the same impact as an abrupt but sustained monetary easing by a central bank. Also, the global monetary dimension of the California Gold Rush should not be overlooked. The California Rush, followed by other rushes in the Americas, Australasia and Africa, provided significant – if uneven and volatile – increases in gold supplies, which acted as a positive monetary stimulus to the global economy. New gold discoveries which started in California, greased the wheels of the global economy, allowing for rapid industrialisation and expansion across the world. Arguably, without the increases in gold supply furnished by the California Gold Rush, the Gold Standard would have become unworkable or at least unable to deliver the necessary monetary stimulus for global expansion that it achieved up to World War One.

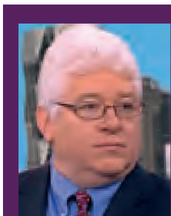
NEW GOLD DISCOVERIES WHICH STARTED IN CALIFORNIA, GREASED THE WHEELS OF THE GLOBAL ECONOMY, ALLOWING FOR RAPID INDUSTRIALISATION AND EXPANSION ACROSS THE WORLD.

Such an expansion in the money supply – which is what the new gold supply from California effectively was under the Gold Standard – had an impact on prices, not just in California and the US, but in the world. Because precious metals were at the base of the monetary system, rushes increased the money supply, which resulted in inflation. According to Robert Whaples, increased gold output from the Californian and Australian gold rushes is linked to a 30% increase in wholesale prices between 1850 and 1855.

The Gold Rush was of immense benefit to the expansion of the US economy. Californian gold exports were key in helping to create a positive balance of trade for the US. The state produced more than half of all the gold produced in the US from 1850 to 1900. More importantly, gold produced from California paid for 10% of the Union's war effort in the American Civil War. The Confederates, on the other hand, had no such access to bullion supplies.

CONCLUSION

Modern California – 'The Golden State' – has its beginnings in the Gold Rush. It created the state, brought in people, and stimulated industry and agriculture, effectively cementing it to the rest of the United States. It made California a net contributor to the US in terms of international trade and GDP, and played a crucial role in financing the Union's efforts in the Civil War. At the same time, the rush played a major role in international development by stimulating demand, especially in the Pacific region. The addition of gold supply also made the Gold Standard practical, effectively greasing the wheels of global trade finance and development far beyond the shores of California.



James Steel is HSBC's Chief Precious Metals Analyst with specific responsibilities for precious metals. He joined HSBC in May 2006 and previously he ran the New York research department for Refco, a large US commodities brokerage house. He has also worked for The Economist in the Intelligence Unit as an economist specialising in commodity producing nations. Jim's primary duties at HSBC include the production of daily market reports, including long term outlooks for both precious and base metals. His responsibilities include supply/demand and price forecasts, as well as qualitative analyses. He is a frequent speaker at commodities related conferences and events. He is often quoted in the financial media and frequently appears on CNBC. He studied economics in London and New York.

MARK BARNARD OBITUARY

BY RICHARD LOWISH

Mark Barnard's career spanned three decades, encompassed all precious metals and included positions at three different companies.

In 1983, he started his professional life in precious metals as one of a cohort of characters in the then nascent trading subsidiary of the Engelhard Corporation. From there, he moved to Morgan Stanley, where he concentrated on marketing gold and silver services out of the firm's New York commodities dealing room. He then moved to Mitsui and its trading operation in the US. Ultimately, he returned to Engelhard in New Jersey and was made responsible for precious metals business development in China and India. Mark retired in May 2015 and, after having been ill with cancer for several months, he passed away on 24 June 2018.

I came to know Mark when I joined Engelhard in 1983. He worked in the New Jersey office while I was employed by Engelhard Metals Limited in London. We met often and our telephone conversations were frequent. He was a conscientious employee who wished to garner as much knowledge of precious metals as he could from both his work and the marketplace, and this resulted in his being asked on many occasions to make presentations about precious metals and the vagaries and caprices of the precious metals markets. In 1989, Mark, along with Alan Austin and G.E. Haslam, edited a publication entitled Platinum Group Metals and the Quality of Life. However, as much as he was a sound, productive and dependable employee, he was even more a steadfast and reliable colleague, who united in himself those qualities that together make up a good friend.

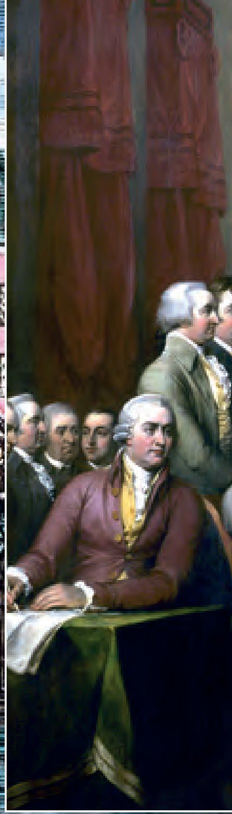
When we were first introduced, I can recall our exchanging half-witted barbs and sophomoric slights about where each of us went to undergraduate school. Whereas I attended a small college in a very obscure part of rural Ohio, Mark studied at the University of Arizona, which is about 2,400 miles or a good three-day drive from where he grew up. And when he regaled me with stories of his undergraduate days and the sleepless sojourns he had to make to get from New Jersey to Tucson, I was convinced that he showed more imagination and less high-hat parochialism than I ever did at the age of 18.

He also had a sense of humour that he often attempted to hide by affecting an adult look of disdain while standing straight in his idiosyncratic tripod stance, with his arms folded over his stomach. His moustache could hide his grin for a bit, but the sham demeanour would succumb to his need to laugh at and sometimes participate in the puerile pranks and half-witted exchanges that often occur on trading floors. His humour though was never malign. On a number of occasions, we played golf together and I can remember how he would look away when I was about to strike the ball. The temptation to fall over into a furious fit of laughter while having to watch me attempt to play a game that he played well must have been of biblical quality. He would betray his feelings at each tee by obviously trying to limit his emotions to a subtle, but nonetheless discernible, sardonic grin. I am certain he thought that I was some sort of berserker who was blundering around the course while swinging a scythe and a mallet. He would just smile, suffer and persevere – even when I would egregiously disregard the rules and throw the ball out of a sand trap or kick the ball out of the rough. And I wasn't a customer.

Mark was resolutely polite and always made an effort to greet and talk to all when he visited us in London at Engelhard Metals Limited, and never were his manners facile or his conversations perfunctory. He was liked because he was straight and sincere, and thus he was always welcome in the UK subsidiary. Geographic distance did not diminish his loyalty or prove a barrier to friendship. I know he travelled privately to the depths of provincial France and to the Upper Austrian Alps in order to visit former colleagues and friends, and their families. Furthermore, he was often a host to others in New York, where he would frequently bring along his wife and son to dinner in order that they could meet those with whom he worked and with whom he was acquainted.

Above all, Mark was devoted to and proud of his wife Felicia and his son Alex. They constituted the two poles around which his life revolved. They made the quotidian grind bearable and, in the last weeks of his life, they kept the irrational at bay.

I and many others will miss Mark. He was one of the good guys.



BOSTON TEA PARTY

BY AELRED CONNELLY, LBMA PR EXECUTIVE

The Boston Tea Party, 16 December 1773. Wood engraving, c1850.

Throughout history, from the earliest rebellions against the agricultural tax levied in Ancient Egypt, societies have revolted against the imposition of taxes.

Indeed, opposition to taxation has led to the collapse of whole empires (Egyptian, Aztec and Roman) and spurned the overthrow of monarchies (French Revolution). But with the 2018 LBMA/LPPM annual precious metals conference rolling into Boston, it would be amiss not to mention what is arguably the most famous tax rebellion in world history – the Boston Tea Party. It may not have strictly been a party nor was it all about tea, but it certainly did take place in Boston.

The introduction in 1773 of the Tea Act by the British Government into its American colonies was designed to give the East India company (EIC) a monopoly over the tea market. The tea tax imposed by Britain on the American colonists was not in itself that punitive, but it followed a succession of other taxes and, as such, was probably the straw that broke the camel's back.

On 16 December 1773, at Griffin's Wharf in Boston, American colonists, angry at Britain for imposing "taxation without representation", dumped 45 tonnes of tea (equivalent to the weight of 3,600 gold bars) into the harbour. The incident became known as the Boston Tea Party.

IT WAS THE CATALYST FOR THE AMERICAN REVOLUTION, WHICH ULTIMATELY GIVE RISE TO THE GREAT AMERICAN DREAM.

The event was significant in that it was the first major act of defiance by the colonists to British rule. It also demonstrated to Britain that the Americans wouldn't take taxation lightly and prompted the colonists across the 13 colonies to begin their fight for independence. It was the catalyst for the American Revolution, which ultimately give rise to the great American dream.

ORIGINS

In the 1760s, Britain was deep in debt (some things never change) and in an effort to balance the books, the British Parliament imposed a series of taxes on American colonists. The first of many taxes was the Stamp Act of 1765, which taxed colonists on virtually every piece of printed paper they used, swiftly followed by the Townshend Acts of 1767, which imposed taxes on a range of staple items including paint, paper and glass.

Britain felt justified in levying the taxes because of growing debts as a result of fighting wars on behalf of the colonists. This, unsurprisingly, was not well received by the colonists, who objected largely on the grounds that they did not have a voice in the British Parliament nor indeed any representation.

BOSTON MASSACRE

On 5 March 1770, annoyed and frustrated with the presence of British soldiers in their streets, a group of American colonists began throwing snowballs at the British soldiers guarding the Boston Customs House and a street brawl broke out. Reinforcements were called and opened fire, killing five. The incident became known as the Boston Massacre.

IMPOSITION OF THE TEA ACT

To appease the colonists, Britain repealed many of the taxes that it had imposed, with the exception the tea tax. In protest, the colonists boycotted tea sold by the EIC and smuggled in Dutch tea, leaving the EIC with millions of pounds of surplus stock and facing the prospect of bankruptcy.

IT MAY NOT HAVE STRICTLY BEEN A PARTY NOR WAS IT ALL ABOUT TEA, BUT IT CERTAINLY DID TAKE PLACE IN BOSTON.

In May 1773, the British Parliament passed the Tea Act, which allowed the EIC to sell tea to the colonies duty-free and much cheaper than other tea companies, but still tax the tea when it reached colonial ports. Tea smuggling in the colonies increased, although the cost of the smuggled tea soon surpassed that of tea from the EIC.

SONS OF LIBERTY

A group of colonial rebels, known as the Sons of Liberty, held a series of meetings protesting against the tax. The EIC tried to bring three ships (Dartmouth, Beaver and Eleanor) loaded with tea into the Boston harbour, but the colonists voted not to pay taxes and refused to allow the tea to be unloaded. In return, Governor Thomas Hutchison refused to allow the ships to return to Britain and ordered the tea tariff be paid and the tea unloaded.

DISGUISED AS NATIVE AMERICANS, A LARGE GROUP OF MEN BOARDED THE DOCKED SHIPS, BROKE OPEN 342 CHESTS OF TEA AND DUMPED 45 TONNES OF TEA INTO THE HARBOUR.

Declaration of Independence, July 4, 1776.

THE FIRST BOSTON TEA PARTY

On the evening of 16 December 1773, a large group of men – many reportedly members of the Sons of Liberty – disguised themselves as native Americans, boarded the docked ships, broke open 342 chests of tea and dumped 45 tonnes of tea into the harbour. All the time, the British ships looked on but made no attempt to intervene.

BOSTON TEA PARTY AFTERMATH

As things go, it was a relatively peaceful incident, no one was hurt and no property was damaged. The participants even allegedly swept the ships' decks clean before they left. Largely as a result of the disguises that they had used, only one of the colonists, Francis Akeley, was actually arrested and imprisoned.

COERCIVE ACTS

But despite the lack of violence, the Boston Tea Party was met with fierce retribution by the British government, with Parliament passing the Coercive Acts (later known as the Intolerable Acts), which served to:

- close Boston Harbor, until the value of the tea lost in the Boston Tea Party was repaid
- end the Massachusetts Constitution and free elections of town officials
- move judicial authority to Britain and British judges, basically creating martial law in Massachusetts
- require colonists to house British troops on demand
- extend freedom of worship to French-Canadian Catholics under British rule (which naturally upset the mainly Protestant colonists).

Britain hoped the Coercive Acts would help to suppress resistance from the colonists and prevent them from uniting against British rule. However, it only served to increase resistance. The other states stood shoulder to shoulder with Boston and sent messages of support as well as supplies.

TEA FOR TWO

A second Boston Tea Party took place in March 1774, when around 60 Bostonians boarded the ship Fortune and dumped nearly 30 chests of tea into the harbour. This event did not gain as much notoriety as the first one the previous year, but it did encourage other tea-dumping demonstrations in other parts of the colonies.

FIRST CONTINENTAL CONGRESS IS CONVENED

Many colonists felt Britain's Coercive Acts were a step too far. On 5 September 1774, elected delegates from 12 of the 13 colonies (except Georgia) met in Carpenter's Hall in Philadelphia for the First Continental Congress to consider how they should resist the British acts of oppression.

Opinion was divided on how best to achieve their aims, but the events of the Boston Tea Party had certainly united them in their determination for independence. Within a matter of weeks, they'd written The Declaration which set out a series of demands:

- repeal of the Coercive Acts
- boycott of British goods
- right to govern independently
- formation of a colonial militia.

Britain retaliated by refusing to pander to their demands and, within months, the American Revolutionary War had begun.

LEGACY

The Boston Tea Party laid the foundations for the colonists to issue the Declaration of Independence, adopted by the Continental Congress on 4 July 1776, when the 13 American colonies severed their political connections to Britain. The American War of Independence which ensued finally ended in 1783 with the signing of the Treaty of Paris on 3 September 1783, in which Britain acknowledged the American colonies as independent. King George III became known as the King who lost America.

Aelred Connelly, PR Executive, LBMA

Aelred joined the LBMA in September 2011. He provides support to the Chief Executive in the administration and organisation of the Association's Public Affairs. He is responsible for Press enquiries, is the editor of the *Alchemist* as well as contributing to other LBMA publications, provision of the website and support for LBMA events.

Prior to joining the LBMA, he worked at the Bank of England for more than twenty-five years, the last five as an analyst in the Bank's gold bullion department.

Blockchain: The Innovation Machine

BY RACHEL HART, TRAINEE LAWYER, LBMA

In 2015, the front page of The Economist labelled blockchain as the trust machine. With the benefit of hindsight, Editor Anne McElvoy suggests a brand refresh for what is arguably the kingpin of the fourth industrial revolution. But amongst a flurry of fad technology, is blockchain our latest hammer and everything we see a nail?

This article highlights the lessons learned from the OECD Blockchain Policy Forum in September, particularly on regulation and implementation before exploring how LBMA's Gold BAR Integrity initiative considers harnessing the technology's momentum.

BLOCKCHAIN THE BUZZWORD

"Blockchain is not a policy. Blockchain is not a regulation. Blockchain is a tool which can be used everywhere." The pertinence of such rhetoric from the Secretary-General of the OECD, praising the ubiquitous status of this technology, is not to be taken lightly.

If you remain sceptical about blockchain's viability, perhaps the fact that the OECD hosted a dedicated two-day event in Paris will convince you otherwise. With policy as the underlying theme (naturally), the Forum provided a platform for government leaders to celebrate the proven and potential use cases for blockchain. With assistance from an audience of blockchain pioneers, leading academics and global corporates, the OECD promised to help governments adopt and adapt to the technology, safely disrupting existing order under the mantra "better policies for better lives". Over a thousand attendees from 70 countries suggests this subject is not one to overlook.

IF YOU REMAIN SCEPTICAL ABOUT BLOCKCHAIN'S VIABILITY, PERHAPS THE FACT THAT THE OECD HOSTED A DEDICATED TWO-DAY EVENT IN PARIS WILL CONVINCE YOU OTHERWISE.

As the Master of Ceremonies, McElvoy cheered and challenged the heavyweights of technologically-progressive societies, including the leaders of Mauritius, Serbia, Bermuda and Slovenia. Listing existing use cases of blockchain at a governmental level could have filled the two-day agenda in itself. The land registry in Sweden, voting systems in Kenya and cashless payments in China were amongst the plethora of evidence for blockchain's feasibility.

'TRUTH' & 'PROOF'

TRULY ATTAINABLE THROUGH A *NOUVEAU ARRIVÉ* SOLUTION?

Blockchain's sales pitch nomenclature was also deconstructed at length: "disruption" (and its newly-positive semantics), "truth" and "proof". Are these timeless concepts truly attainable through a nouveau arrivé solution? While phrases such as "trust, transparency and traceability" are often trotted out at the mention of blockchain, I was keen to hear more about its realistic potential for change in this fourth industrial revolution.

REGULATING BLOCKCHAIN

So, will the regulatory landscape adapt to include blockchain? The short answer I took from the Forum was "…not yet". Many felt the technology and what we consider standard was not yet mature. Regulating blockchain could risk the technology's iterations steaming ahead of any legislative process, therefore leaving ill-fitting frameworks in its wake.

Nonetheless, some regulators appear keen to harness blockchain's momentum. Regulatory sandboxes, such as those in the UK and Singapore, enable technologists to test their developments under the supervision of these watchdogs, encouraging wider adoption if successful and redevelopment if not.

IMPLEMENTING AND INNOVATING

When contemplating examples of blockchain's real-life implementation, including self-sovereign identity systems, tokenisation of plastic waste and prevention of counterfeit products, I struggled to see why blockchain would be the panacea to such prevalent international problems. Why not cloud computing or simple online hosting of digitalised records?

Taking a step back, let's explore what exactly blockchain entails. Blockchain is a subset of distributed ledger technology and was originally invented to underpin Bitcoin. Blockchain involves a network of networks, like a giant database, into which permissioned parties can enter permissioned data. Thanks to cryptography, a footprint of each input is safely recorded. The footprint is then verified by several other parties, therefore ensuring the integrity of the information stored on the chain. Its decentralised nature means it has no central point of failure, which significantly reduces (but does not eliminate) its 'hackability' – a huge upsell against other technology offerings.

While public policies can be launched, the cornerstone of the blockchain's implementation relies on significant take-up by private companies. It is no secret that blockchain is expensive – the demand for expertise exceeds supply. But with a community uniting pioneers from technology, sociology, cryptology and economics, amongst many others, is the risk of not participating higher?

BLOCKCHAIN AND PRECIOUS METALS

So, what's next for blockchain? At LBMA, we are exploring the potential of blockchain to uphold the highest levels of integrity and transparency for precious metals. For supply chain provenance, can such technology help to mitigate risk faced throughout the life cycle of the bar, such as fraudulent and erroneous data entries?

WHILE PUBLIC POLICIES CAN BE LAUNCHED, THE CORNERSTONE OF THE BLOCKCHAIN'S IMPLEMENTATION RELIES ON SIGNIFICANT TAKE-UP BY PRIVATE COMPANIES.

Looking at the simple supply chain from mine to refiner to vault, we are considering how data can be stored on-chain. Throughout the life cycle of the bar, data including brand, origin, custody and location could be tracked and traced on a permissioned basis. By using blockchain to host provenance data, LBMA hopes to maximise the technology's defining tamper-proof feature once the input has been verified. This immutability, by way of a cryptographic 'footprint', of data could allow a bar's unique features to be forever recorded with upmost security.

As part of our Gold Bar Integrity initiative, a working group has been formed to unpack the benefits of blockchain in the context of precious metals and draft a standard against which LBMA could potentially recognise blockchain solutions. This principles-based approach would enable technologists to build a blockchain which securely records the provenance data of precious metals. This could involve the digitalisation of precious metals and interoperability with pioneering security features and other blockchains. By exploring the potential of this technology, LBMA hopes to incentivise supply chain parties to engage in collaborative efforts to achieve the primary goal of blockchain innovation.

If you require further information, please contact Rachel Hart, rachel.hart@lbma.org.uk.

Rachel Hart, Trainee Lawyer, LBMA.
Deals with legal and compliance matters affecting the precious metals market, including financial regulation and the Responsible Sourcing Programme. She has taken responsibility on a number of initiatives and helps to manage any relevant legal work on behalf of LPMCL, as well as support the market on the application of REACH and the Global Precious Metals Code.

Before joining the LBMA, Rachel worked as a Finance Knowledge Assistant at Freshfields Bruckhaus Deringer, specialising in structured finance and debt capital markets. She read law at University of York and University of Law, London.

MARKET MOVES

RBC EXPANDS LONDON PRECIOUS METALS TRADING ACTIVITY WITH KEY HIRES

Anton Down joined RBC in September 2018 as Director, Precious Metals. He brings over 25 years' specialist industry experience to RBC, with the last 13 years at Scotiabank, on the Precious Metals desk. Prior to this he was at Mitsui and Mitsubishi.

Ian Penney joined RBC in August 2018 as Director, Precious Metals Trading, overseeing the Global PGM (Platinum Group Metals) Trading books. He has over 13 years' experience in Commodities, previously working at Standard Chartered Bank, Mitsui, Natixis and latterly Scotiabank where he was Head of the Platinum Group Metals Trading.

They will both assist in expanding RBC's precious metals business in Europe across a broad base of clients covering Producers and the petrochemical, refining, automotive and electronic sectors.

DEBAJIT SAHA JOINS THOMSON REUTERS GFMS

Debajit Saha has been appointed as Senior Precious Metals Analyst for Thomson Reuters GFMS in India. He replaces Sudheesh Nambiath who after a distinguished period as part of the team has left to become the Head of the India Gold Policy Centre.

He has considerable experience in the sector. He comes from Bullion Bulletin, where he was the Editor for some years. With his expertise in the precious metals markets and in risk management plus his extensive range of contacts we are looking forward to working benefiting greatly from his analysis and understanding of the gold markets, particularly in India and the UAE.

NATALIA TYBELWSKA JOINS METALS FOCUS

Natalia Tybelwska joined Metals Focus in August 2018 as a Regional Sales Director. She will focus on client relationships and developing new business in Europe and Africa. She has over 8 years experience in the metals markets having previously worked for InfoMine, Intierra and S&P Global.

ISABELLE GARREAU JOINS STANDARD CHARTERED BANK

Isabelle Garreau joins the Metals trading team at Standard Chartered Bank in New York. She will be responsible for helping to grow the Commodities franchise across the region. She has 15 years experience in Commodities markets including structuring and trading, starting her career at ANZ before moving to Bank of Nova Scotia London and most recently she was at Unicredit where she set up their physical metals trading business.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RAYMOND CHAN OBITUARY

BY PHILIP KLAPWIJK

Raymond Chan Fat-chu, a legend in the Hong Kong and global gold markets, passed away on 4 September 2018.

In recent years, while maintaining a lower profile, he was still active behind the scenes doing business in China and promoting the Hong Kong-Qianhai project on behalf of the Chinese Gold and Silver Exchange Society, of which he was a past President. However, this was rather small beer for the man whom the local press had once dubbed Hong Kong's 'King of Gold'.

Raymond was indeed one of the key players in the Hong Kong gold market in its heyday in the 1980s, when the former British colony was the fourth-largest trading centre for the precious metal after London, New York and Zurich. He was an early adaptor, for instance, in the operation of gold consignments and cross-border trade from Hong Kong.

In 1990, he publicly listed Tem Fat Hing Fung (Holdings) Ltd, the property and gold trading company that his father had established in 1949. As his activities expanded, in 1996, Raymond spun off the gold business from Tem Fat Hing Fung (Holdings) Ltd. and publicly listed this in the name of RNA Holdings Ltd, the corporate entity that most came to know him by.

It was in the 1990s that Raymond Chan, assisted by his younger brother Alex, who also recently passed away, became a major force in Hong Kong gold trading and also a pioneer in the emerging mainland China market. It had been clear to him from an early stage that Deng Xiao Ping's economic reforms would one day result in China becoming the world's largest consumer of gold and Raymond wanted to be part of this. Already at the beginning of the 1990s, he was working closely with the Chinese authorities to liberalise the China gold market and facilitate official gold imports into the country.

Raymond was also a visionary when it came to developing jewellery demand in China, with his companies investing in manufacturing facilities and, especially, in retail outlets. In 1998, he opened the Jewellery Gallery in Shanghai's Westgate Mall, at the time the largest branded jewellery store in China.

During the latter part of the same decade, Raymond was also intimately involved in the modernisation of several Chinese gold-mining companies' operations and management.

Problems stemming from investments that went bad in the early 2000s hit Raymond hard. In their aftermath, he was eager to rehabilitate himself and had made giant steps in this direction when he was sadly struck down with the illness that eventually ended his life.

For those who knew him, particularly during his prime in the 1980s and 1990s, Raymond was a singular individual, with a relentless focus on success in all areas of his business. Yet, this extraordinary drive rarely detracted from his positive and friendly personality or crimped his highly sociable nature.

Those who wined and dined with him over the years, especially at the annual Chinese New Year banquets which Raymond hosted for all who were participants in the worldwide bullion market, will surely recall his generosity and good company.

He will be greatly missed.

FACING FACTS

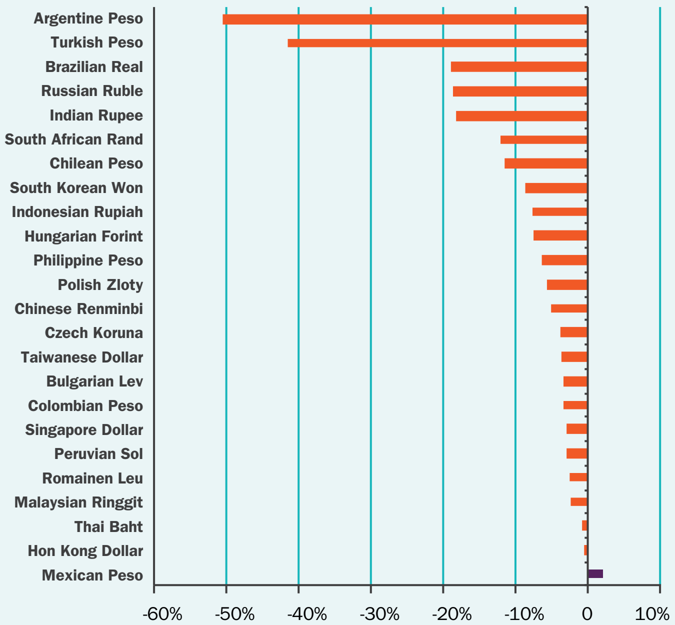
CENTRAL BANK GOLD HOLDINGS RISE AS EMERGING MARKETS DIVERSIFY THEIR RESERVES

BY NATALIE SCOTT-GRAY, METALS DEMAND ANALYST – RESEARCH AND FORECASTS, GFMS, REFINITIV

Central bank gold holdings jumped in the second quarter (Q2), rising by 35% or 106 tonnes year-on-year to their highest level since (Q3) 2017. With struggling emerging market economies plunged further into turmoil on the back of a global trade war, rising yields and a strengthening US dollar, central banks pursued safe-haven protection in the form of gold while reducing their exposure to foreign exchange reserves.

EMERGING MARKETS DIVERSITY AWAY FROM THE US DOLLAR

EMERGING MARKETS CURRENCIES YEAR-TO-DATE

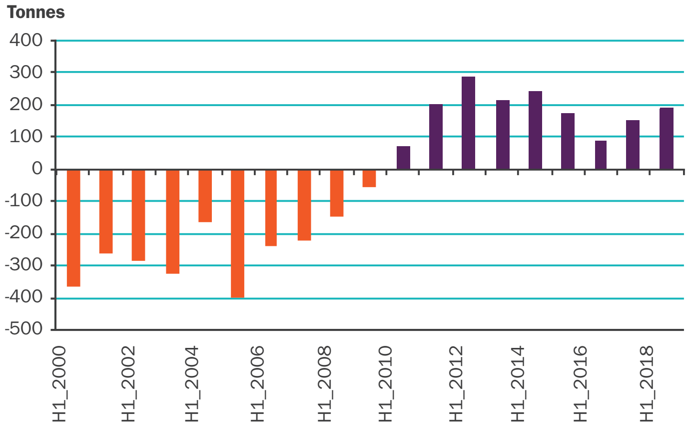


In the first six months of the year (H1), central banks increased their gold holdings by 27% or 191 tonnes in comparison to the same period a year ago. This marks the ninth consecutive year of H1 purchases of gold, having previously recorded sales in H1 over the 2000-2009 period (and may well have had, initially, something to do with the financial crisis).

RUSSIA BUYS FOREIGN EXCHANGE RESERVES AS OIL PRICES RISE – GOLD INCLUDED

For the sixth consecutive year, the Russian Central Bank maintained its position as the largest acquirer of gold in H1, purchasing 105 tonnes and bringing total gold holdings to 1,944 tonnes, firmly placing it as the fifth-largest gold holding country in the world (behind the United States, Germany, Italy and France and above China). Despite rising oil prices (which have averaged $72/bbl this year) and Russia's Finance Minister endorsing the increased purchase of foreign exchange reserves (including US dollars) when oil prices average over $40/bbl, the central bank's purchases of gold rose to their highest level in H1 in this century. The implementation and threat of further US and EU sanctions this year in response to the crisis in Ukraine and chemical (and biological) warfare that took place in the UK in April, has resulted in the rouble weakening, falling by 21% intra-year. Indeed, The World Bank has lowered its forecast for the country's economic growth from 1.7% to 1.5% for 2018.

OFFICIAL SECTOR GOLD PURCHASES AND SALES (H1 PERIOD)



TURKEY

The Central Bank of Turkey (CBRT) was the second-largest purchaser of gold in H1, with gold holdings increasing by 38 tonnes. The local currency had fallen by 40% (at the time of writing), on the back of concerns over foreign currency debts (largely built on US dollars), in addition to the country's strained relationships with both the United States and Germany. The CBRT continued to seek economic independence, diversifying away from its foreign exchange reserves in favour of gold.

INDIA

In a similar stead, India, which is the 11th largest gold holder globally, purchased gold for first time this century at 8 tonnes. Fears over global risks, market volatility and rising yields in the West have encouraged markets to limit their exposure to the US dollar.

ARGENTINA

In Argentina, following the sale of foreign currency in the spot market to stabilise the peso, which had fallen to its lowest level on record, the country requested a bailout from the International Monetary Fund this year. Central bank purchases for the country rose by 7 tonnes, its largest H1 purchase since 2000.

VENEZUELA

While Venezuela has long been in economic turmoil, the country is now at breaking point, with a humanitarian crisis at hand and a currency which is almost valueless. A host of fresh US sanctions has limited the manoeuvrability of the country to raise money through international banks and targeted individuals close to the President. In order to boost liquidity for dwindling international reserves in the country, gold 'swap' deals took place over the last few years, drawing down gold reserves, with gold as a percentage of total reserves falling to their lowest level of 64.6% since July 2016. Over H1, Venezuela has tried to buy back its safe-haven asset, purchasing 2 tonnes. Elsewhere, purchases were made by Columbia and Mongolia, each acquiring 2 tonnes of gold.

SALES EXPECTED TO REMAIN LIMITED

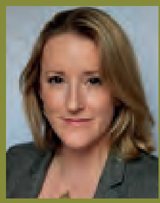
While the scales were heavily tipped in favour of central banks purchasing gold in H1, sales were recorded over this period for countries such as Germany and Australia, at 4 tonnes each. It is likely that these transactions are part of each country's regular pattern of small-scale sales as part of their retrospective official coin programmes. Further sales (above 1 tonne) were recorded by Qatar, Sri Lanka and Ukraine.

MORE PURCHASES TO COME?

We forecast that central bank transactions, or net official purchases, will exceed levels set in 2017 at 450 tonnes. Gross sales levels, which have remained far below 2010 levels over the last seven years, are expected to remain weak. Gross purchases are likely to remain dominated by Russia, particularly in light of the threat of fresh sanctions from the West, while other emerging markets suffering from trade disputes and rising yields such as Turkey will continue to diversify away from the US dollar, where possible. China, which continues to hold a very low level (2.4%) of gold in its foreign exchange reserves (compared to most European countries, which hold between 60% and 80%), is similarly expected to build holdings (despite not reporting a change since October 2016).

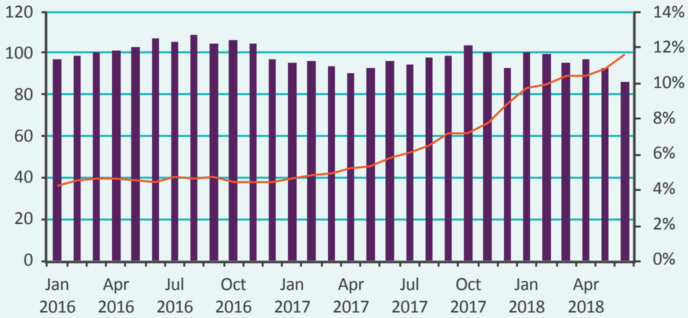
REPATRIATION

Repatriation of gold reserves by central banks has become a common theme over the last few years, with Germany, the second-largest gold holder in the world (with total reserves standing at 3,370 tonnes at end-June), announcing in August last year that it had completed its four-year repatriation operation (which was first announced in 2013). A total of 674 tonnes of gold were moved from the Banque de France and the Federal Reserve Bank of New York, back to its own vaults. The move was originally set to be completed by 2020. Adding to this theme, the Hungarian National Bank (MNB) announced in March this year that it intends to take back all its gold reserves (3 tonnes or 98,000 ounces) currently stored in the Bank of England.

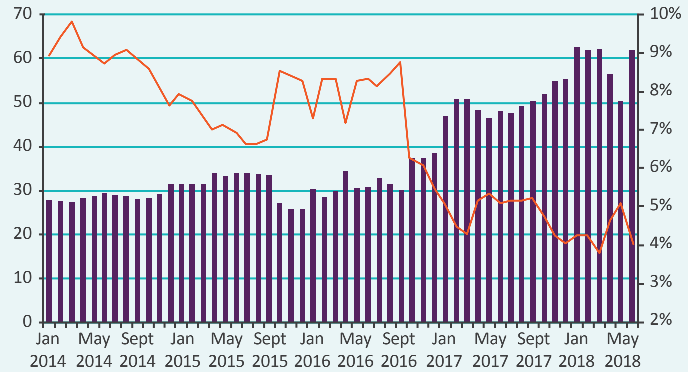


Natalie Scott-Gray is a Metals Demand Analyst at GFMS, Refinitiv. She is the key analyst covering materials used in rechargeable batteries, predominately utilised in both the automotive and power grid sectors. She is the lead analyst for the GFMS coverage on cross commodities, in addition to heading up the team's technical analysis across the metals space. Furthermore, she is responsible for covering metal demand in the European markets. Prior to GFMS, Natalie was an oil and gas upstream analyst. She holds a Masters Degree in Chemistry from the University of Edinburgh.

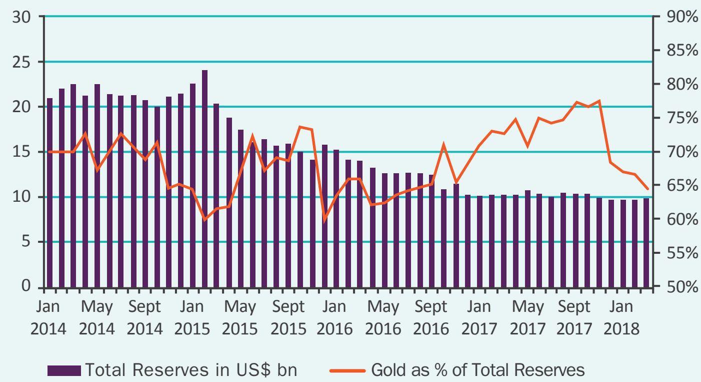
TURKISH TOTAL RESERVES AND GOLD AS A PERCENTAGE OF TOTAL RESERVES (CALCULATED USING THE MONTHLY AVERAGE JUNE 2018 GOLD PRICE)



ARGENTINIAN TOTAL RESERVES AND GOLD AS A PERCENTAGE OF TOTAL RESERVES (CALCULATED USING THE MONTHLY AVERAGE JUNE 2018 GOLD PRICE)



VENEZUELAN TOTAL RESERVES AND GOLD AS A PERCENTAGE OF TOTAL RESERVES (CALCULATED USING THE MONTHLY AVERAGE JUNE 2018 GOLD PRICE)



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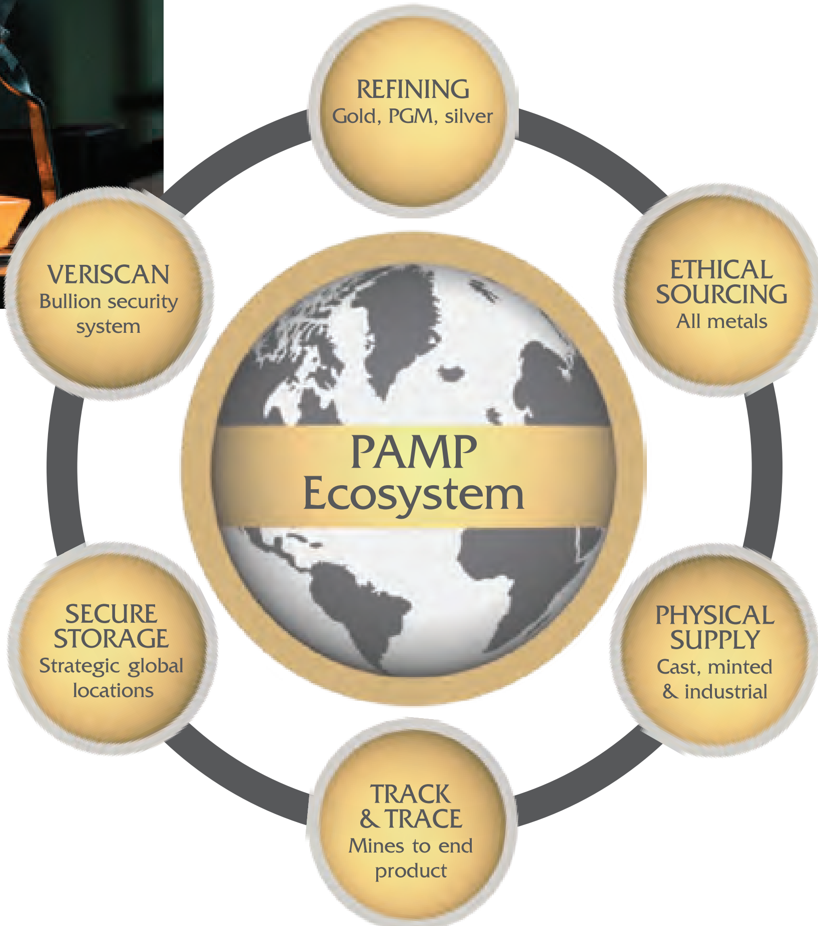

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