

# Price processes in the global gold market

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## Abstract

Recurring global crises, increasing uncertainty in the world economy, rising geopolitical risk and recently geoeconomic fragmentation have renewed and intensified interest in gold in the 21<sup>st</sup> century. The precious metal still retains an important role in the economy, most notably as a long-term store of value and efficient portfolio diversifier. One of the most remarkable changes on the global gold market refers to the role of central banks. Over several decades after the breakup of the Bretton Woods system, central banks were selling gold held in their reserves. However, following the global financial crisis central banks ceased to be a source of gold supply and became a significant component of global demand for gold. We demonstrate that gold remains valuable and expensive in terms of both currencies and other commodities. Moreover, its record prices are a result of rising geopolitical tensions and uncertainty as well as the resurrection of inflationary pressures. We argue that gold prices are also overwhelmingly influenced by the monetary policy of the Federal Reserve and the US dollar exchange rate. On the other hand, the rapid increase in the price of gold reflects rising income and private demand for gold in emerging market economies, particularly in China and India. The purpose of the article is to assess the value of gold using a wide range of metrics as well as to present the determinants of gold prices, with special attention given to demand and supply fundamentals and financial instruments based on gold. The research methods used include statistical-descriptive analysis, comparative analysis and literature study.

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## 1. Introduction

Although gold has been deprived of most monetary functions following the demise of the Bretton Woods international monetary system, the precious metal still retains an important role in the economy, most notably as a long-term store of value and efficient portfolio diversifier. Recurring global crises, increasing uncertainty in the world economy, rising geopolitical risk and recently geoeconomic fragmentation have renewed and intensified interest in gold in the 21<sup>st</sup> century (IMF 2023). One of the most remarkable changes on the global gold market relates to the role of central banks. Over several decades after the breakup of the Bretton Woods system, central banks were selling gold held in their reserves. These sales became coordinated and gradually reduced during subsequent central bank agreements on gold starting in 1999. Most notably, following the global financial crisis central banks ceased to be a source of gold supply and became a significant component of global demand for gold, with the share rising from 1.9% in 2010 to 23.3% in 2023.

Another significant trend pertains to the price of gold. In the 21<sup>st</sup> century the price of gold has increased exponentially, starting as low as USD 260/oz in April 2001 and peaking due to subsequent crises. In March 2008 it exceeded the level of USD 1000/oz for the first time in history and has remained above this level since October 2009. The peak occurred in September 2011 amidst the sovereign debt crisis in the euro area when the gold price reached USD 1900/oz. It rose sharply following the outbreak of the COVID-19 pandemic in March 2020 and breached the psychological barrier of USD 2000/oz, reaching USD 2064/oz in August 2020. Subsequently, gold surged due to the outbreak of war in Ukraine and its price reached USD 2050/oz in March 2022. On the back of persistent geopolitical tensions the price of gold remained historically high in 2023 and has stayed above USD 2000/oz for most of the time since November 2023. Moreover, in March 2024 the price of gold reached unprecedented levels and has stayed well above USD 2100/oz since then. This trend continued in April with the price of gold skyrocketing and reaching USD 2400/oz (see Figure 1). This phenomenon was largely driven by two factors, namely continuously rising geopolitical tensions and widespread expectations of interest rate cuts by major central banks. Consequently, gold prices remain well above historical trends. Moreover, as we demonstrate in the article, gold remains highly valuable not only in US dollars and other major currencies, but also in terms of commodities such as silver, platinum, and oil.

We believe that aside from conditions on the gold market (demand and supply fluctuations) as well as geopolitical and geoeconomic developments (notably crises) there are three fundamental factors that determine gold prices: inflation rates and inflation expectations, exchange rates, and interest rates and monetary policy of major central banks. That said, price formation is also determined by characteristics of supply of and demand for gold. Moreover, the unique features of gold have been instrumental in the rise of demand for gold in the 21<sup>st</sup> century. Gold is a special type of asset, since it combines properties of a commodity used, for example, in the production of jewellery and industrial applications, and a financial asset, where it is used as a store of value. Gold is relatively scarce and – unlike fiat currencies – it has an inherent value and cannot be “created” infinitely. Above all, gold has no counterparty risk. For these reasons, gold is widely used as a protection against inflation, to hedge US dollar exposure, or even as an asset of last resort.

The global gold market is made up not only of the physical gold segment, but also the “paper gold” segment, which consists of a number of derivatives that do not represent ownership of physical gold and include gold-backed exchange traded funds (ETFs), gold futures, gold options and forward contracts.

The market of paper gold has grown considerably over the last two decades. In effect, it currently exerts a significant influence on gold prices.

The purpose of the article is to assess the value of gold using a wide range of metrics as well as to present the determinants of gold prices, with special attention given to demand and supply fundamentals and financial instruments based on gold. The research hypothesis of the article is that gold remains valuable and expensive in terms of both currencies and other commodities. Moreover, its record prices are a result of rising geopolitical tensions and uncertainty as well as the resurrection of inflationary pressures. We argue that gold prices are also overwhelmingly influenced by the monetary policy of the Federal Reserve and the US dollar exchange rate. Importantly, gold prices reached record levels despite higher interest rates, which demonstrates its protective function and role as a long-term store of value. On the other hand, this reflects rising income and private demand for gold in emerging market economies, particularly in China and India, and persistent purchases of central banks. The research methods used include statistical-descriptive analysis, comparative analysis and literature study.

## **2. Measurement of gold's value**

Unlike fiat currencies, which have no inherent value, gold remains inherently valuable. It has a combination of unique properties that clearly distinguishes it from other forms of investment. Above all, gold is scarce. Its supply is limited and its extraction is both lengthy and capital-intensive. Although global gold supply grows almost every year, its increase is slow and often below the growth in demand. This remains in sharp contrast to other financial assets, the supply of which can be inflated quickly and easily. Unlike fiat currencies, gold cannot be devalued. It is impervious to decay, rust, tarnish or biological activity (Erb, Harvey 2013). Gold is both a commodity and a financial asset. Most notably, gold has no counterparty risk. This differentiates it from other forms of investment and even those perceived as risk-free, namely government bonds enjoying the highest ratings. These bonds can still be defaulted upon. Moreover, governments may decide to inflate their debt.

The most common way to express the current value of gold is its spot price in terms of USD. Historically, from 1833 to 1933 gold prices were constant at around USD 20/oz and from 1934 to 1967 at USD 35/oz. A two-tiered pricing system was created in March 1968, and the market price for gold has been free to fluctuate since then. As a consequence of the demise of the Bretton Woods international monetary system and termination of gold's official monetary role, the precious metal became an independent financial asset and its price became much less influenced by the official sector. In effect, the price of gold started to increase from USD 40/oz in 1971 to USD 100/oz in 1973 and USD 160/oz in 1975 (yearly average price). This reflected high inflation amidst the first oil shock. Another historical jump in the dollar gold price started in autumn 1979 and peaked in January 1980 at USD 850/oz. The yearly average gold price in 1980 amounted to USD 615/oz. This resulted not only from high inflation and the second oil shock, but also geopolitical factors such as the Soviet intervention in Afghanistan and the Iranian revolution. However, this rise in gold price was relatively short-lived and it moderated to USD 376/oz on average in 1982 and remained relatively flat in 1980s and 1990s.

Since the beginning of the 21<sup>st</sup> century, there has been a gradual increase in the price of gold despite the continuing Great Moderation. In February and April 2001, the price of an ounce of gold fell to a 20-year low of slightly below USD 260/oz. The subsequent rise in the price of gold was

substantial and on the eve of the subprime crisis in the US it reached USD 690/oz in April 2007. The second historical jump in gold prices started in autumn 2007 and lasted much longer than the previous one dating 1979–1980. Gold prices soared as a result of the global financial crisis. In March 2008 it exceeded the level of USD 1000/oz for the first time in history and has remained above this level since October 2009. The peak occurred in September 2011 amidst the sovereign debt crisis in the euro area, when the gold price reached USD 1900/oz. Thereafter, gold prices fell significantly and remained at depressed levels – albeit invariably above USD 1100/oz – until they started to increase gradually in the second half of 2019. They rose sharply following the outbreak of the COVID-19 pandemic in March 2020 and breached the psychological barrier of USD 2000/oz, reaching USD 2064/oz in August 2020. The subsequent moderation in gold prices was limited. They surged due to the outbreak of war in Ukraine and reached USD 2050/oz in March 2022. A period of particularly strong growth in gold prices followed the Hamas attacks on Israel on 7 October 2023. The price on the London market has remained virtually unchanged above USD 2000/oz since late November 2023. At the end of last year, it stood at USD 2078.4/oz. Moreover, in March 2024 the gold price reached unprecedented levels and stayed well above USD 2100/oz. This trend continued in April, with the price of gold skyrocketing and reaching USD 2400/oz. This phenomenon was largely driven by two factors, namely continuously rising geopolitical tensions and widespread expectations of interest rate cuts by the major central banks.

Changes in the price of gold do not simply result from a rise or fall in its inherent value, but to a great extent reflect changes in the value of the USD. In addition, the dollar gold price is strongly influenced by the Fed monetary policy and US interest rates. There is a negative correlation between the spot dollar price of gold and the USD exchange rate: when the USD appreciates, the price of gold falls, and when USD depreciates, then the dollar-price of gold rises (Capie, Mills, Wood 2005). That said, the rapid increase of the gold price in USD/oz in the 1970s was largely the result of USD depreciation and high inflation in the US. In the same vein, drastic interest rate hikes by the Federal Reserve under Chairman Paul Volcker in the early 1980s curbed inflation in the US and resulted in strong appreciation of the USD, which depressed the dollar price of gold.

To gauge the external value of the USD, we use not only the EUR/USD exchange rate, but also the US Dollar Index (DXY). The US Dollar Index is used to measure the value of the dollar against a basket of six foreign currencies, which include the euro (EUR), Japanese yen (JPY), Canadian dollar (CAD), British pound (GBP), Swedish krona (SEK), and the Swiss franc (CHF). The euro remains the largest component of the index, making up 57.6% of the basket. The weights of other currencies are JPY (13.6%), GBP (11.9%), CAD (9.1%), SEK (4.2%) and CHF (3.6%). Despite historically robust inverse correlation between the gold price and the USD exchange rate, it has weakened in recent years (see Figure 2). In 2022–2023, also during the synchronized monetary policy tightening by the major central banks and expectations of further interest rate hikes, US real yields rose and the USD appreciated. Strikingly, the dollar price of gold significantly increased over this period. We would argue that in this period rising geopolitical tensions augmented the safe-haven properties of gold and translated into increased demand for and price of the precious metal, thus weakening the inverse correlation of gold and USD. Moreover, the outbreak of war in Ukraine in February 2022 resulted in higher prices of oil, gas, wheat and other commodities, which triggered a considerable rise in inflation expectations, driving up the price of gold. In 2024, widespread expectations of interest rate cuts by the major central banks have supported gold's price. Most notably, attacks on Israel carried out by Hamas on 7 October 2023 and fears of an escalation of military conflict in the Middle East have led to the exceptional rise in gold's price.

The nominal price of gold in terms of other leading currencies generally tracks the USD price. The trends and peaks of USD/oz are clearly reflected in the price of gold nominated in EUR, GBP, JPY or CHF (see Figure 3). That said, gold remains expensive along a broad range of currencies.

The LBMA Gold Price is used as an important benchmark throughout the gold market. It is determined twice a day (at 10:30 am and 3:00 pm) by the members of London Bullion Market Association. This price is the reference price for many financial products for which gold is the base instrument. The afternoon one is more widely used. However, the gold price in terms of USD is not homogenous around the world since there are spreads on USD/oz between locations and markets. There are also several regional gold prices.

As China has become one of the world's leading gold markets over the past two decades, this also coincided with the development of the Shanghai Gold Exchange (SGE). The SGE was established by the People's Bank of China and officially launched in October 2002. In 2016 the SGE introduced the Shanghai Gold Benchmark Price to enhance China's role as a price-setter and to broaden international participation in the Chinese gold market. The Shanghai Gold Benchmark Price (or Shanghai Gold Fix) is determined at an auction held twice daily on trading days at 10:15 am and 2:15 pm (Beijing time). The benchmark is quoted in renminbi (RMB) per gram. At the same time, the introduction of this benchmark gold price in Shanghai was perceived as an additional tool to promote the international role of the Chinese currency.

As a result of robust gold demand, stable production and falling imports after late 2022, the Shanghai-London gold price premium jumped to unseen levels in 2023. Overall, the Shanghai Gold Benchmark Price surged by 17% in 2023. Restrictions imposed by the Chinese central bank on gold imports in a move to defend the exchange rate of depreciating RMB were crucial in this regard. The Shanghai-London premium reached an annual average of USD 29/oz (1.5%) in 2023, the highest level in history (see Figure 4). On a monthly average basis, September's USD 75/oz (3.9%) was the largest. The daily record was set on 14 September 2023, when the local gold price premium reached USD 121/oz (6.4%). The spread narrowed to USD 76/oz on 18 September after the People's Bank of China relaxed curbs on imports of the precious metal.

It is widely believed that gold has no yield. It does not pay a coupon. In fact, gold does have an interest market, although it is quite small. Gold can be lent and borrowed. The supply used to be dominated by central banks and the demand by gold producers (for use of their hedging programmes) and market participants with short positions. The other feature that makes gold interest different is that it is determined purely by supply and demand rather than by a central authority (central bank). That said, there exists a yield curve for gold deposits (Spall 2009, pp. 51–56).

Moreover, in 1989 the LBMA started publishing the Gold Forward Offered Rate (GOFO) as a way to increase transparency in the gold market. The GOFO is an indication of the forward price of gold in terms of a percentage above (premium) or below (discount) the spot price. The LBMA used to publish the GOFO for one, two, three, six and twelve months each business day. Hence, this rate served as an international benchmark and the basis for the pricing of gold swaps, forwards and leases. However, the GOFO was discontinued in January 2015. Henceforth, the GOFO is quoted individually by each dealer and quotes are not available publicly. Nevertheless, the GOFO remains one of the most important gold market interest rates. It is calculated as the difference between the US dollar interest rate (LIBOR) and the gold lease rate (GLR). Normally, the interest rate for borrowing US dollars is higher than the interest rate for borrowing gold, implying that the GOFO is usually positive. On the other hand,

a negative GOFO used to be very unusual and it means that it is cheaper to borrow against gold than dollars. In the past, a drop of the GOFO below zero (as in 2008) always signalled an impending rise in the price of gold since higher interest for borrowing gold than for borrowing US dollars was an indication of a sharp rise in physical demand for gold (Le, Zhu 2013).

Since 2015, the GOFO has been quoted privately in specific marketplaces where gold lending transactions occur (Fisher 2024). Fisher points to interdealer broker systems, which serve as platforms for participants to negotiate and finalize gold lending arrangements. That is why, the GOFO is still perceived as an important tool to gauge factors affecting gold prices. Some observers believe that the GOFO is not confined to the gold market itself. Fisher provides arguments to support the view that the GOFO reflects economic reality as well, as it is also an instrument with the help of which economic factors can be gauged. Nevertheless, the role of the GOFO should not be overestimated, most probably, due to its simplicity. After all, in line with Fisher's arguments it is confined mainly to interest rates. Even if the GOFO is believed to be an interesting and still useful instrument to assess the tendencies in the gold market, its analysis goes beyond the content of this text.

Since the USD/oz price reflects changes in both the value of gold and the USD, it has a significant limitation as a gauge of gold's value since it does not necessarily reflect changes in supply and demand fundamentals in the gold market. Therefore, it is useful to analyse the price of gold in terms of other commodities. We believe that three of them provide an important gauge of gold's value: silver, platinum and oil. Importantly, as Baur, Beckmann and Czudaj (2017) emphasize, there is no established model to assess if the price of gold is overvalued or undervalued and therefore a relative valuation framework based on gold price ratios remains a necessary analytical tool.

The gold-silver ratio (GSR) expresses the price relationship between gold and silver. It is calculated by dividing the spot price of one ounce of gold by the spot price of one ounce of silver. The GSR indicates how many ounces of silver are needed to purchase one ounce of gold (GoldCore 2013). Throughout history, gold has always been more expensive than silver. Under bimetallism, the officially adopted silver-to-gold parity ratio of around 15:1 reflected the market ratio at the time (see Figure 5). The increased volatility in the GSR has only started in the 20<sup>th</sup> century.<sup>1</sup> In general, this ratio tends to rally during periods of market crises, disruption and instability and usually peaks during recessionary periods. An huge increase occurred between 1919 and 1940, when the ratio skyrocketed from 18.5 to 100. However, this peak was short-lived and after the WWII was followed by a steep fall to 17 in 1968. An upward trend started after Russia's invasion of Afghanistan and the Iranian hostage crisis and led to the second peak of 99.7 in 1991, which coincided with the first Gulf War. In the 21<sup>st</sup> century, the ratio has ranged mainly between the levels of 50 and 70. During the global financial crisis the GSR peaked at 85 in 2008. Thereafter, silver prices have underperformed gold for most of the time since 2011 (that year the GSR was as low as 32). Annual average gold prices rose more than those of silver every year from 2012 to 2019, with the exception of 2016. Following the onset of the COVID-19 crisis, the GSR reached its all-time record of 121 in March 2020. Since then it has fallen but remained high (90 in January 2024). From these developments we can infer that gold tends to rise in value much greater than silver during both economic and political crises. One important reason why silver tends to lag behind gold is that the silver market is significantly smaller than the gold market.

The gold-silver ratio is a helpful tool for understanding broader market and economic conditions. As demonstrated above, this ratio isn't stable and fluctuates significantly over time. Major increases of

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<sup>1</sup> For the whole of the 20<sup>th</sup> century, the average gold-silver ratio was 47.



the gold-silver ratio are mostly related to growing gold prices and declining silver prices. It is argued that the gold-silver ratio can serve as a good indicator of future silver price developments and it enables investors to identify buy and sell signals (Arendas 2016). When the GSR is at historically high levels, it could be perceived as a signal that silver is undervalued and create expectations of a fall in gold prices. Recent peaks in the gold-silver ratio can therefore suggest that silver is relatively undervalued compared to gold.

Another important gauge of gold's value is the gold-platinum ratio (GPR), which is the relationship between the gold spot price and the platinum spot price. This indicator works just like the GSR, i.e. it shows how many ounces of platinum are needed to purchase one ounce of gold, thereby indicating the relative strength of gold prices. Throughout history, gold has tended to be less expensive than platinum, with the ratio only rising above 1 on a few occasions. It reached 1.2 in 1975 on the back of the first oil shock and a surge in inflation and peaked at the same level in 1982 (see Figure 6). Subsequently, the ratio remained around 0.5 for a decade leading to the global financial crisis. Then it shot up from 0.43 in June to over 1 in December 2008. Since 2015 it remained invariably well above 1 and since 2018 above 1.5. The gold-platinum ratio peaked at 2.48 in March 2020 and reached all-time high of 2.55 in April 2024.

That said, gold is currently more than twice as expensive as platinum. It raises the question whether platinum – like silver – is undervalued in relation to gold. The supply of platinum remains lower than that of gold, but demand for platinum remains strong due to many industrial applications. Nevertheless, gold started to be more expensive than platinum in 2015, indicating low confidence in the global economy. This is because gold remains a safe-haven asset, while platinum is an industrial metal. Therefore, the gold-to-platinum ratio is a useful indicator of confidence among investors and gold tends to outperform platinum when this confidence is deteriorating.

The gold-oil ratio (GOR) refers to the relationship between the gold spot price and spot price of one barrel of crude oil. It shows how many barrels of oil can be purchased with one ounce of gold. Most notably, it provides insight into market sentiment and is regarded as a leading indicator of changes in the economic situation. Gold and crude oil are both commodities, and their price trends are consistent in the long run. In other words, there is a positive correlation between prices of gold and oil (Guo 2023). The positive correlation has often meant that higher oil prices have coincided with higher gold prices. Both oil and gold markets are highly sensitive to geopolitical events. It is argued that the gold-oil ratio is a useful indicator of the condition of the global economy: a higher GOR indicates that the economy is in distress. It is generally believed that a gold-oil ratio exceeding 25 tends to be accompanied by geopolitical events, which also indicates possible risks for the global economy (Cheng et al. 2022). We can clearly see that the gold-oil ratio has exceeded 25 on several occasions, and each time it has been accompanied by severe geopolitical risk: the war in Somalia in 1993 (max = 30), the Asian financial crisis in 1998 (max = 30.5), global financial crisis in 2008 (max = 25) and Brexit in 2016 (max = 41.5) (see Figure 7). However, the last case illustrates that the GOR also remains strongly influenced by changes in the supply of and demand for oil. In November 2014, the Organization of Petroleum Exporting Countries (OPEC) decided to maintain production levels despite the oversupplied market, which resulted in a steep decline in oil price (CRS 2019). It fell from around USD 110 in 2014 to USD 28 in 2016. The GOR reached the unprecedented and highest level in history of 87 in April 2020 due to the impact of the COVID-19 crisis.

Historically, the gold-oil ratio has been 16 on average and normally ranges between 10 and 30. It reached the first maximum in July 1973, when gold soared to USD 120/oz while oil remained fixed

at USD 3.6 a barrel. In effect, the GOR rose dramatically to nearly 34. In the wake of the first oil shock, prices of both commodities surged, but in case of oil prices the increase was much greater, which translated into a fall in the GOR to nearly 13 in January 1974 and further to 8 in September 1976. The Iranian revolution in early 1979 and the Iran-Iraq war that started in 1980 were catalysts for a commodities boom from early 1979 to mid-1981. The gold price spiked from around USD 200/oz in January 1979 to USD 850/oz in January 1980. The GOR reached an all-time low in June 2008 when one ounce of gold was equivalent to only 6.4 barrels of oil.

### **3. Determinants of the gold price**

Digeorgia (2009) distinguishes four main forces that determine gold prices: (1) gold fundamentals as a commodity (i.e. developments of supply and demand), (2) the value of the USD, (3) gold's role as a safe haven during political crises (war, political unrest, etc.) and (4) gold's role as a safe haven during economic crises (inflation, market crashes, etc.). Bukowski (2016) points out that the main factors determining the price of gold in international markets include the USD/EUR exchange rate, log return on S&P 500, changes in Brent crude oil prices, changes in the yield-to-maturity of US 10-year Treasury bonds and changes in the price of gold in the previous period.

We have already presented movements in the gold price during conflicts and crises. Supply and demand fundamentals will be analysed in sections 4 and 5 since they have unique characteristics that differentiate gold from other commodities. We believe that aside from conditions on the gold market (demand and supply fluctuations) and geoeconomic developments (notably crises and more recently geoeconomic fragmentation) there are three fundamental factors that determine gold prices: inflation rates and inflation expectations, exchange rates, and interest rates and monetary policy of major central banks.

Gold is widely acknowledged to provide protection against inflation, i.e. it serves as an inflation hedge, particularly in the long term (Gomis-Porqueras, Shi, Tan 2020). In general, an increase in actual inflation or inflation expectations leads to an increase in investors' demand for gold, as a result of which its price also rises (Gasparyniene et al. 2018). The empirical evidence in general shows that the nominal price of gold and the general price level move together in the long run (see Figure 8). Moreover, increasing inflation expectations reduce the perceived purchasing power of money, which translates into a reduction of money held and an increase in gold holding. It is argued that gold prices respond more to expected inflation rather than actual inflation. In addition, Tkacz (2007) argues that gold prices have a potential as a leading indicator to determine future movements in the rate of inflation and therefore they should be monitored closely by central banks. Gold prices have so far received little attention as a leading indicator of inflation since the precious metal is perceived and analysed primarily as a commodity. However, unlike other commodities it has historically been used as a store of value and hedge against inflation, thereby acting as a financial asset. He finds that gold price movements proved to be significant determinants of inflation up to two years in advance and that this was most significant for developed countries that have formally adopted inflation targeting.

That said, the rise of gold prices in the periods of elevated inflation provides protection against a loss of purchasing power of fiduciary currencies. Therefore, during periods of high inflation, gold historically remains stable or increases in price, thereby serving as an effective store of value and safe-



-haven asset (Gourinchas, Jeanne 2012). This is particularly discernible in the long term. In 1977 Roy Jastram, a professor of business at Berkeley, published a book titled *The Golden Constant*, which was an examination of how gold's purchasing power has remained consistent over the centuries. He concluded that from 1560 in England, and from 1800 in the USA, gold has held its purchasing power in England and the United States (Jastram 2009).

Following the breakdown of the Bretton Woods system and the end of the two-tier pricing system of gold in 1973, there was no longer any official price of gold. Its price was free to float in the same way as any other commodity. It coincided with the period of a dramatic rise in inflation and inflation expectations in the 1970s. In effect, gold prices soared, as has been demonstrated in the previous section of this article. Conversely, gold prices dropped dramatically after the Fed under the chairmanship of Paul Volcker adopted a severely contractionary monetary policy to reduce the US inflation rate (see Figure 9). This was particularly visible in the period of rapid disinflation in 1980–1983. Thereafter, the steady downward movement of expected long-term inflation following the Volcker disinflation period coincided with a decrease in the real gold price (Barsky, Epstein, Lafont-Nueller 2021). In the 1990s the gold price remained subdued and within a narrow band of fluctuations. This reflected equally subdued inflation at that time and coincided with relatively strong growth and booming stock markets, especially in the case of high-tech companies. However, the bursting dot-com bubble in 2000 ended this euphoria and marked the beginning of a period of unprecedented growth in gold prices.

There is also usually negative correlation between the gold price and stock markets. This characteristic implies that gold is especially in demand after a collapse in stock market returns. Draper, Faff and Hillier (2006) support the idea of a strong indirect relationship between the fluctuations in the gold price in response to stock market volatility. Hood and Malik (2013) demonstrated that gold is an effective hedge for the US stock market.

There is one more question, namely if gold always offers an efficient hedge against inflation? The same question deals with the aforementioned correlation between gold prices and securities. It is rather impossible to offer unanimous answers (Ram 2024) to these questions, as there is one significant problem. The gold price is subject to several factors which disturb the direct function of a device against inflation. According to Ven Ram, an investor who decided to buy gold at the end of 2012 (when the price of an ounce was around USD 1,675) would close such an investment (in real terms) at the end of 2023 with a loss of nearly 10%. The cumulative inflation for the entire period was above 32%, while the increase in gold price in the same period was about 20%. Obviously, there are two factors at stake. Firstly, the inability of the nominal gold price to catch up with the real value of money was mainly attributed to high inflation in 2022. Secondly, had the same investor waited with unwinding his gold position until the end of the first quarter of 2024, he would have reached the breakeven point. And in April 2024 he would have even achieved a profit of around 9%.

Stretching our analysis further in time offers similar inconclusive results. Analysing the correlation between gold and inflation over the last 40 years is the best confirmation of the aforementioned analysis. For example, between 1984 and 2004, gold prices remained fairly stable with a cumulative increase of almost zero percent. This surprising result can be attributed above all to the Great Moderation and a significant fall in inflation along with subsequent lower interest rates. Still, the inflation rate in the assessed period decreased significantly, but it has not been completely eliminated. Its average annual level was slightly over 3%. That is why, if an investor had decided to buy gold in March 1984 and then wanted to sell it in March 2004, he would have had to reckon with a loss of almost 46%.

The heavy losses in real terms between 1984 and 2004 would have been compensated by hefty gains in the two following decades. Between 2004 and 2024 gold prices had already increased sixfold (from just over USD 400 to almost USD 2,400). Such a surge in gold prices in the last two decades may come as a surprise. All the more so because in the assessed period there was not only low inflation, but occasionally even deflation. And even the drastic surge in inflation in 2022 (as a result of the post-pandemic reality) is unable to offer a convincing explanation behind such a strong surge in gold prices. Its average annual return in the analysed period was 2.56%. If we were to limit our analysis to the end of 2020, we would be talking about a level equal to 2%. But even 2.56% is not much different from the average inflation from 1984 to 2004, and yet the scale of profits in investing in gold in these sub-periods is almost incomparable. That is why, in line with Ven Ram, the timeframe of the analysis should be extended. Due to the limitations in the availability of data, it is necessary to start with 1928 and look at the actions of an investor who would have decided to invest in this metal at that time. In the analysed period, the average inflation in the US amounted to almost 3.1%, while the average annual profit on gold would be less than 5%. In his analyses, Ven Ram compared the prices of gold with the quotations of the stock market index (S&P 500) since the end of 1927. His research showed that an investment in this index would bring a higher income (about 6% per annum), when the profit on gold would be equal to less than 5%. And if we add to this the profits from dividends, the profits from investments in shares would be about 9.6%. Gold therefore protects against inflation, but investors have better hedges within their reach to protect against the erosion of the value of money.

Gold prices are also determined by the level of interest rates and monetary policy stance (WGC 2018b). The relationship between interest rates and gold prices is not straightforward. In general, they have an inverse relationship. Gold is an asset whose value moves negatively with real interest rates: gold prices rise as interest rates fall (lower interest rates imply lower opportunity cost for holding gold) and gold prices fall as interest rates rise (higher interest rates imply higher opportunity cost for holding gold).

#### Graph 1

Gold price changes resulting from the Fed monetary policy stance, USD exchange rate and supply and demand fundamentals on gold market

Fed tightening / USD appreciation Sg > Dg	XAU↓
Fed tightening / USD appreciation Dg > Sg	XAU↑
Fed expansionary / USD depreciation Sg > Dg	XAU↓
Fed expansionary / USD depreciation Dg > Sg	XAU↑

Source: authors' own elaboration.

Historically, expansionary monetary policy and lower interest rates in the US have resulted in rising gold prices (see Figure 10). When investors expect central banks to ease and yields to decline, gold as an investment becomes more attractive, which translates into a rise of its price, and vice versa. On the other hand, deflationary pressures (as in 2012–2016) translated into a fall in gold prices. However, recent history has proven that this correlation is not so straightforward. In an attempt to tame inflation, the Federal Reserve raised interest rates at 11 consecutive meetings beginning between March 2022 and July 2023. Despite this exceptional monetary tightening the price of gold has peaked several times and reached its all-time high in April 2024.

Similarly to the inflation hedge function, gold also serves as a hedge against domestic currency depreciation. Especially when the currency is rapidly losing its value, there tends to be a flight to gold. Recently, this has been exemplified by the case of substantial depreciation of the Turkish lira and the concomitant rise in demand for gold in Turkey. However, this coincided with runaway inflation in Turkey and what was termed as “unorthodox” monetary policy of the Turkish central bank (i.e. cutting interest rates in response to rising inflation). Therefore the two properties of gold as an inflation hedge and a hedge against currency depreciation are fundamentally similar. The value of a currency either decreases through inflation or through a depreciation. In gold price terms, both inflation and currency depreciation increase the price of gold in local currency.

Gold is commonly referred to as a safe haven asset. A safe-haven investment is an investment that has no correlation or a negative correlation with other markets and assets (Dee, Li, Zheng 2013). Gold falls into this category since it tends to move in opposition to stocks and bonds, thereby serving as a hedge against losses in those asset classes (Maatoung, Triki 2020). In this case, gold also serves as a portfolio diversifier. The safe-haven characteristic of gold is reflected in changes in its price in times of crisis, as evidenced by several studies (Cai, Wong 2001). In times of both economic and political turbulence, gold prices tend to surge. The positive correlation between rising geopolitical risk and gold prices is also confirmed by recent studies (Baur, Smales 2020; Beckman, Berger, Czudaj 2019). Geopolitical and geoeconomic factors like international tensions and conflicts as well as episodes of economic and political instability create uncertainty that drives investors to purchase gold as a flight to safety. This implies that the value of gold moves in the same direction as geopolitical tensions. That's precisely what happened in the first quarter of 2022, when the outbreak of military conflict in Ukraine translated into a 6% rise in the price of gold.

Last but not least, there are also factors that relate to the unique characteristics of gold, which distinguish bullion from other forms of investment and other components of official reserve assets. These factors strengthen the price and value of gold since they tend to increase the demand for the precious metal. First of all, gold reserves are devoid of credit risk associated with the insolvency of the issuer. In addition, there is no currency risk. Thus, unlike debt securities denominated in foreign currencies, whose depreciation or devaluation leads to a decline in the value of the reserves held in them in terms of national currency, gold is not exposed to such significant fluctuations and the possibility of loss in value. Unlike foreign exchange reserves, gold reserves are also not affected by the monetary policies of central banks that issue reserve currencies (especially the Fed). In addition, there is no possibility of unlimited expansion of gold, whereas in the case of reserve currencies there is the right of central banks to unlimited money creation. It is also important that gold reserves are not exposed to the risk of inflationary debt financing.

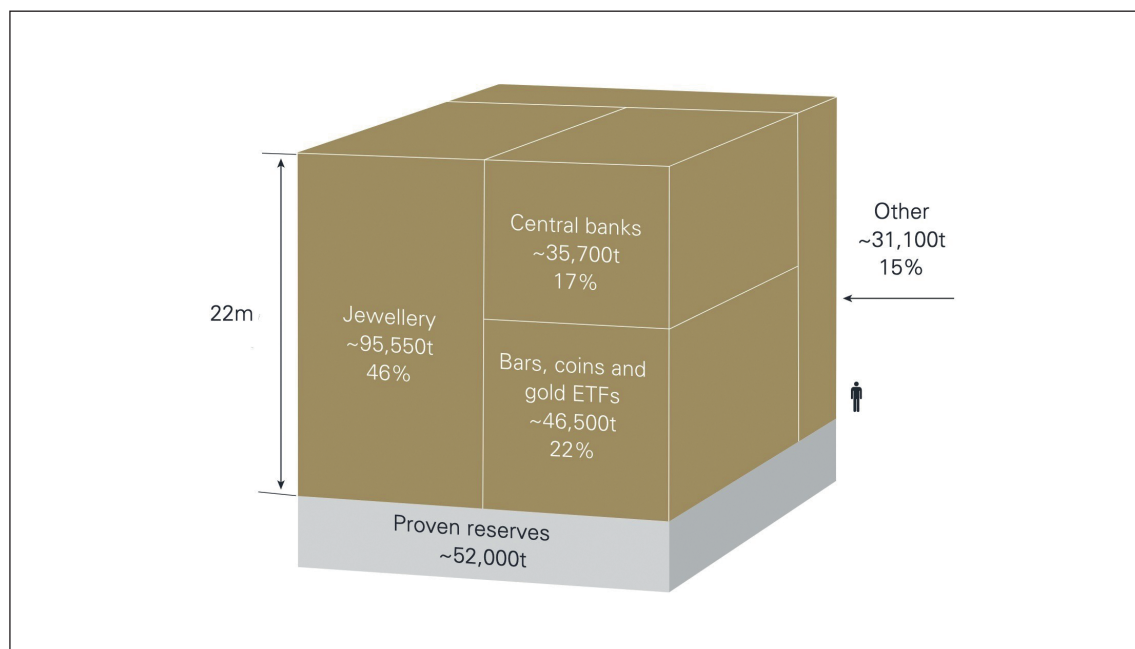
## 4. Supply of gold

### 4.1. Gold stocks

It is estimated that approximately 209 000 tonnes of gold have been mined throughout history, of which around two-thirds has been mined since 1950 (WGC 2023d). This volume represents the above-ground gold stocks. Since gold is virtually indestructible, almost all of it is still available in one form or another. It is also assumed that most gold has already been mined. That said, global underground gold reserves are currently estimated at around 52 000 tonnes. The largest reserves are found in Australia, Russia, South Africa, the United States, Peru, Brazil, Canada, Indonesia. Although China continues to be the world's largest producer of gold, its reserves are lower than in countries mentioned above and estimated at 1900 tonnes (US Geological Survey 2023).

Graph 2

Total above-ground gold stocks and total identified underground gold reserves



Source: WGC (2023d).

To emphasize the scarcity of gold, it is customary to present its entire above-ground stocks as a cube with sides of 22m. What is more, these stocks grow at a very slow rate since global mine production adds approximately 3500 tonnes per year (10-year average to end 2022). Jewellery remains the largest component of above-ground gold stocks and accounted for 46% as of the end of 2022. Gold in investment form (bars, coins and gold held by ETFs) was the second-largest component with the share

of 22%. Central banks' reserves – also a form of investment, although with different characteristics – represent 17% of gold stocks. The remaining 15% is made up primarily of industrial applications and holdings by financial institutions (WGC 2023d).

## 4.2. Mining and recycling

Mining is the main source of gold to the market and on average accounts for two-thirds of total supply each year. The remaining third comes from recycling. Mine production as a supply source has relatively low price elasticity and is characterized by various rigidities. This results from a number of factors. Large-scale mining is extremely capital-intensive. Moreover, the life-cycle of a gold mine is long. It takes between 10 and 20 years before a mine is operational and able to produce material that can be refined (WGC 2018c). This is attributable to lengthy and complex phases of exploration and development (planning and construction of a mine). Moreover, it takes time to alter mine plans and operations in response to positive changes in the gold price. On the other hand, changes in gold mining y/y are relatively small and therefore do not have a significant impact on the spot price of gold.

Despite the aforementioned constraints, global gold mine production has increased significantly, with most of the rise in production occurring after 1950. After a steady rise from 880 tonnes in 1950 to 1480 tonnes in 1970, gold production declined slightly after the demise of the Bretton Woods international monetary system. It again started to rise after 1981. Most notably, there was a rapid increase in gold mining after the global financial crisis: from 2300 tonnes in 2008 to 3630 tonnes in 2020, which corresponds to a 57.7% increase over this period (see Figure 11). Such an increase was largely stimulated by relentlessly rising gold prices on the back of growing demand resulting, *inter alia*, from a decline in trust in fiduciary money and the monetary system based on it.

The global supply of gold is currently very fragmented. Since the 1970s more countries have emerged as substantial gold producers. Above all, a huge change occurred in the case of South Africa, which accounted for the bulk of gold mining after WWII. However, its gold production started to decrease in 1970 and this decline was exceptional in scale – from 1000 tonnes annually in 1970 to only 92.6 tonnes in 2022. Currently, the geographical composition of gold mining is characterized by a number of big players, but without a clear dominance, as was the case of South Africa (see Figure 12). In 2007, China overtook South Africa as the world's largest gold-producing country. In 2019, Russia surpassed Australia to become the second-biggest gold producer (Webb 2021). In Africa, Ghana became the largest gold producer, overtaking South Africa in 2018. As a result of these changes, gold supply became more geographically diverse.

The costs of gold production are a key factor determining the viability of mining. They also directly impact gold prices. The all-in sustaining cost (AISC) measures the total cost associated with sustaining current levels of gold production over time. The World Gold Council first introduced this metric in 2013. It includes a broad range of costs covering not only extraction and processing costs, but also the costs of exploration, obtaining the extraction rights, administrative costs, taxes as well as maintenance and development costs of a mine. Much like the spot price of gold itself, AISC is generally measured on a per-ounce basis to compare to the market price of gold. In 2000 AISC amounted to around USD 300 per ounce of gold. Since then, AISC have surged steadily. In 2022 average AISC reached a record level of USD 1276/oz. This was well above the last peak at USD 1116/oz in 2012. In Q1 2023 these costs reached



a quarterly record of USD 1358/oz. That said, it has to be emphasized that historically the price of gold was between 45% and 60% above the cost of production. There has also been long-term correlation between the cost production and the price of gold. Going forward, if production costs continue to increase, particularly in the event of prolonged inflation, the price of gold would very likely reach new highs.

As already mentioned, recycling remains the second source of gold supply and has accounted for about 30% of it over the past twenty years. However, recycling does not lead to an increase in above-ground gold stocks. Price changes are the main driver of gold recycling. It is estimated that price fluctuations account for around 75% of annual changes in gold recycling. Conversely, mine production takes far longer to respond to price changes. Moreover, economic and financial crises boost gold recycling. This was particularly visible during the 1997-1998 Asian financial crisis and the 2008-2009 global financial crisis. As regards composition of this source of gold supply, jewellery accounts for roughly 90% of recycled gold and industrial recycling constitutes the remainder (WGC 2018d).

## **5. Demand for physical gold**

Demand for gold relates to both physical gold (jewellery, bars, coins) as well as “paper gold”. In this section, we analyse demand for physical gold, while financial markets of gold-related products will be presented in the next section. Ghosh, Levin and MacMillan (2004) divide gold demand into two components. The first is the “use demand” for gold: the precious metal is used directly in the production of jewellery, coins, electrical components and in dentistry. The second is the “asset demand” for gold: central banks, governments, fund managers and individuals hold gold as an investment. That said, gold can be used as an asset in both physical and “paper” form. The asset demand for gold is traditionally associated with the view that gold is an effective hedge that can insulate investors against inflation and various forms of uncertainty. Since supply of gold remains relatively stable and is characterized by numerous rigidities, the changes in demand for gold have a much greater impact on its price. On the other hand, demand for gold has by far greater price elasticity than its supply.

In the wake of the global financial crisis, the demand for gold (including OTC demand) increased significantly and reached 4.5 thousand tonnes in 2011. Subsequently, the demand fell to 4.3 thousand tonnes in 2013. Afterwards, despite significant yearly fluctuations, demand for gold recovered and reached consecutive peaks of 4.8 thousand tonnes in 2016 and 4.9 thousand tonnes in 2013 and in 2023 (see Figure 13).

In the analysis of the composition of global demand for gold, it is customary to distinguish its four main sources: jewellery fabrication, investment demand, technology demand and central bank purchases (see Figure 14). Traditionally, jewellery constitutes the largest driver of demand for gold. However, a major change that has taken place since the global financial crisis was the comeback of central banks as important buyers of gold. That said, over the last decades shifts in the sources of demand and supply – both sectoral and geographic – have transformed the gold market, which is now more diverse and stable as a result.

## 5.1. Jewellery fabrication

Gold jewellery represents the largest source of annual demand for gold. The share of this sector has declined over recent decades (from 84% in 2000), but it still accounts for around 50% of total gold demand. Moreover, jewellery demand rebounded sharply following the COVID-19 shock. In 2023, jewellery accounted for 48.7% of gold demand. India and China are by far the largest jewellery markets, together accounting for over a half of the global total. In 2023, China and India accounted for 30.1% and 26.9% of total jewellery demand, respectively (see Figure 15). However, jewellery is typically considered one of the weaker drivers of gold prices since many people buy jewellery and keep it for years. Jewellery could also be considered a form of investment since it serves as a store of value for individuals all over the world.

There are the two basic determinants of gold jewellery demand: the price of gold and the income or wealth of the country. Aside from this, socio-cultural and religious factors strongly influence this component of demand for gold. Estimates of price and income elasticity of gold jewellery demand for different regions of the world are provided by the World Gold Council.

In all cases the price elasticity of gold jewellery consumption is negative, meaning that a rise in the price of gold will lower this consumption. Conversely, income elasticity of gold jewellery consumption is positive and the higher one's income/wealth, the more likely one is to purchase gold jewellery (Immanuvel, Lazar 2020). That said, both price and income elasticity of gold jewellery consumption is greater in emerging and developing economies than in advanced economies (Murenbeeld 2001).

The strong demand for gold in emerging economies was driven by rising income and wealth as well as sociocultural considerations. GDP per capita has been rising steadily in China and India in the 21<sup>st</sup> century (except for 2020 in India). Between 2000 and 2022 GDP per capita measured in current USD increased by 1226% in China and 445% in India (see Figure 16). In Turkey the rise was very dynamic until the global financial crisis but exhibited a downward trend afterwards (it rebounded only after the COVID-19 shock). That said, a further increase in the level of income would signal that demand for gold in these economies would remain strong in the future. In addition, demographic factors would also boost demand for gold in emerging markets where the population is rising, most notably in India. Furthermore, in some developing countries where a large proportion of the population does not have easy access to the financial and banking system, gold is often used as a means of storing value and passing down savings to next generations (UNCTAD 2016).

## 5.2. Private investment and industry

Although jewellery also represents a form of investment, it is common practice to present and analyse investment in bars and coins separately. Moreover, this segment represents transactions by private agents, whereas central banks are treated as a separate source of demand due to its characteristic nature. That said, investment represented the second-largest source of global gold demand until 2022, when its share accounted for 23.9%. Nevertheless, its share decreased from 38.5% in 2010, whereas central banks' demand was steadily increasing. In 2023 purchases of central banks became the second-largest source of demand for gold, with a share of 23.3%, while investment accounted for 21.2%. That said, depending upon market circumstances, the investment component of demand can vary substantially from year to year. Despite these fluctuations, physical investments in bars and coins remained relatively high between 2010 (1204 tonnes) and 2023 (1182 tonnes) (see Figure 17).

The geographical structure of investment demand for gold is much more diverse than that of jewellery. The greatest source of this demand originates in China and accounted for 23.5% in 2023. India ranked second and accounted for 15.6% in 2023. A huge turnaround occurred in Germany, where investment demand for gold dropped by 75% in 2023 and its share in global investment demand fell from 15.5% in 2022 to just under 4% in 2023. In the past decade, small gold bars and coins accounted for two-thirds of annual gold investment demand and one-quarter of global gold demand.

Gold has also become an important industrial metal since it is highly conductive and corrosion resistant. Its technological applications are typical for electronics, healthcare and space exploration (WGC 2023a). Nevertheless, industrial demand for gold has been steadily decreasing in recent years and dropped from 460.7 tonnes in 2010 to 298 in 2023. As a percentage of global demand of gold, the share of the technology sector dropped from 11% in 2010 to 6.7% in 2023. This happened mostly due to a move towards alternatives to gold, notably to copper and palladium-coated copper applications in the bonding wires sector (UNCTAD 2016). Moreover, the share of gold used in dentistry fell significantly from 10% in 2010 to 3% in 2023. That said, industrial demand is still driven by the electronics sector, which accounted for 81% of gold used in technology in 2023. Gold is largely used in the production of electronic and electrical components such as connectors, bonding wires, printed circuits, electrical contacts and semiconductors (WGC 2018e).

### **5.3. Central bank purchases**

For a prolonged period following the demise of the Bretton Woods international monetary system central banks were selling their gold reserves and therefore constituted a significant component of gold supply (Shafiaee, Topal 2010).<sup>2</sup> A decisive change in their attitude towards gold occurred under the impact of the 2008–2009 global financial crisis. It caused a huge drop in confidence in the international monetary system and, in particular, in the government debt securities of the issuing countries of the main reserve currencies. In 2008, central banks became net buyers of gold again (WGC 2021). Since 2010, central banks have increased gold reserves by 7800 tonnes and held a total of 36 700 tonnes at the end of 2023 (see Figure 18). This represents 17% of the world's gold reserves. At the same time, central banks' share in global gold demand increased from just 1.9% in 2010 to 23.3% in 2023 (see Figure 14). In 2022, central banks purchased 1082 tonnes, the largest gold purchases since 1967, while in 2023 they purchased 1037.4 tonnes of gold, only slightly lower than in 2022 (see Figure 19) (WGC 2023e, 2024). It should be noted that the bulk of central bank purchases took place in emerging economies, while gold reserves in developed countries remained virtually unchanged. As a result, the disparity between the shares of advanced economies (AEs) and emerging and developing economies (EMDEs) in global gold reserves has narrowed significantly. The share of AEs decreased from 84.1% in 1996 to 68.4% in 2022, while the share of EMDEs increased from 15.9% in 1996 to 31.6% in 2022.

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<sup>2</sup> Central banks' sales were initially uncoordinated which – given their size – destabilized the gold market. Therefore central banks from advanced economies decided to conduct sales in a coordinated manner. The First Central Bank Gold Reserve Agreement (CBGA 1) was in effect until September 2004 and aimed to reduce gold reserves held by participating central banks in a controlled and coordinated manner. Subsequent agreements were concluded for the years 2004–2009 (CBGA2), 2009–2014 (CBGA3) and 2014–2019 (CBGA4). It was very symptomatic that gold sales were significantly reduced under CBGA3 and almost abandoned in the case of CBGA4.

Aside from the unique properties of gold already mentioned, the increase of its share in official reserve assets was also often driven by a desire to reduce dependence on the dominant reserve currency – the US dollar (Liu, Papa 2022). This is particularly evident in countries on which the United States imposed sanctions as well as in countries that are afraid of being sanctioned (Greenwald 2020). The dollar in this case becomes a kind of “financial weapon” and an instrument of US foreign policy (McDowell 2023; Nölke 2022). That said, gold is perceived as an “unfreezable asset”, provided that it is stored domestically (McDowell 2022). Eichengreen (2022) emphasizes that the freeze of official reserve assets of the Bank of Russia resulted in an increased tendency to relocate gold from London and New York to domestic vaults. Gold reserves offer special protection in this context, as they allow diversification of political risk and provide a strategic hedge in the event of armed conflict. For this reason, gold is referred to as an “asset of last resort”. The historical role of gold in reserves also remains important. It is argued that historically gold reserves were treated as a “war chest” (Bordo, Eichengreen 1998). For central banks, gold traditionally represents an investment that serves as a long-term store of value (Polášková, Komárek, Škoda 2019). Therefore, holding gold remains in conformity with the overriding goal in the management of official reserve assets, i.e. ensuring safety and preservation of value over the long term (Nugée 2000). At the same time, the unprecedented growth of global foreign exchange reserves created a need for diversification. In this context, there are growing concerns about the health of the US dollar, which is mainly caused by the deteriorating fiscal position of the United States (Bordo, McCauley 2017; Eichengreen 2021; Prasad 2019). Diversification of reserves away from the dollar has already been identified (Arslanap, Eichengreen, Simpson-Bell 2022). Gold is also an effective diversifier of central banks’ reserve assets, primarily due to the low degree of correlation of its price with the prices of other assets and its negative correlation with the US dollar exchange rate (Baur, McDermott 2009; Bialkowski et al. 2015). Thus, gold is a countercyclical component of a reserve portfolio (World Gold Council 2021). Hence, this creates room for an increase in the share of gold in official reserve assets (Arslanap, Eichengreen, Simpson-Bell 2023).

The Bank of Russia played the leading role in central banks’ gold purchases until 2019. The Russian central bank increased gold reserves by 1.93 thousand tonnes from 2007 to 2022. The gold-buying policy was a part of a reserve de-dollarization strategy, as a result of which the US dollar’s share in reserves was reduced from 43% in 2014 to 16.4% in 2021. At the same time, Russia significantly increased the share of gold in official reserve assets to 21.7% in 2021. At the end of 2023, gold accounted for 25.7% of reserves. In 2023 the People’s Bank of China took the lead in gold purchases by central banks, acquiring 225 tonnes. China’s gold reserves increased to 2235 tonnes as a result, placing the country sixth in the ranking of central banks holding the largest gold reserves. However, the share of gold in official reserve assets remained low at 4.3%.

The second-largest purchases of gold in 2023 were conducted by the Polish central bank (Narodowy Bank Polski, NBP). The bank bought 130 tonnes of gold that year, increasing its gold reserves to 358.7 tonnes. Since 2018, NBP has purchased 255.7 tonnes of gold (25.7 tonnes in 2018, 100 tonnes in 2019 and 130 tonnes in 2023) (see Figure 20). The share of gold in NBP’s official reserve assets also increased significantly from 3.3% in 2000 to 12.6% in 2023. In terms of gold reserves, NBP ranks 16<sup>th</sup> among central banks worldwide and 8<sup>th</sup> among European ones. Moreover, the Management Board of NBP decided to increase the share of gold in its official reserve assets to 20% over 2024–2025.

Singapore ranked third among central banks with the largest gold purchases in 2023. The country’s central bank (the Monetary Authority of Singapore) played a leading role in gold purchases in Q1 2023,

increasing its reserves by 68.7 tonnes (a return to purchases after a hiatus since July 2021). For the year as a whole, Singapore purchased 77 tonnes and the MAS gold reserves stood at 230.3 tonnes at the end of 2023. As in China, gold reserves accounted for only 4.3% of Singapore's official reserve assets. The Reserve Bank of India (RBI) also conducted gold purchases. The RBI's policy of systematically increasing gold reserves has only been in place since 2018 (the purchase of 200 tonnes of gold from the International Monetary Fund in 2009 was a one-time operation). At the same time, it is symptomatic that the bank buys gold in small quantities, but on a fairly regular basis. In 2023 the RBI reduced the scale of purchases compared to previous years and bought 16.2 tonnes of gold (compared to 77.5 tonnes in 2021 and 33.3 tonnes in 2022). Between 2018 and 2023 the RBI increased its gold reserves by 245.5 tonnes. At the end of 2023 these reserves amounted to 804 tonnes and accounted for 8.6% of official reserve assets.

In 2023 the case of Turkey was striking. Between 2017 and 2022 the Central Bank of the Republic of Türkiye (CBRT) remained consistently one of the key buyers of gold and increased its gold reserves by 504.9 tonnes. In 2022 the CBRT was the central bank that purchased the largest amount of gold (147.3 tonnes). It should be mentioned that the resources reported on the balance sheet of Turkey's central bank are higher than the actual gold reserves owned by the CBRT. This is an effect of the Reserve Option Mechanism (ROM) introduced in 2011, which allows commercial banks to place a portion of the reserve requirement in gold (up to 10% of the reserve requirement). In January and February 2023 the CBRT purchased 45.5 tonnes of gold, while between March and May it sold as much as 159 tonnes in response to a strong increase in demand for gold in the face of hyperinflation and a significant depreciation of the lira. Since Turkey had imposed a temporary ban on gold imports, the increase in demand posed a risk of destabilizing the local gold market. The CBRT's gold sales were also aimed at defending the lira exchange rate. However, in April 2023 the central bank resumed purchases, proving that the sale was a tactical measure and did not represent a change in its strategy based on increasing gold reserves. Significant purchases in the second half of 2023 allowed the CBRT to rebuild its gold reserves and at the end of the year they amounted to 540 tonnes, a level only slightly lower (by 1.8 tonnes) than at the end of 2022.

In 2023, the central banks of Kazakhstan and Uzbekistan continued to sell gold. However, these are special cases, as the central banks of these countries buy domestically produced gold and then sell this gold abroad. Consequently, they are classified as gold sellers in the statistics (see Figure 21).

Bearing the scale of their purchases in mind, central banks' demand remains a significant driver of gold prices. Despite the rise in interest rates globally – which should depress prices of a non-yielding asset like gold as bonds' yields become more attractive – rampant central bank buying of bullion has supported prices. The World Gold Council (WGC) forecasts indicate that central banks will remain net buyers of gold, but the scale of their purchases is unlikely to exceed 1000 tonnes for the third consecutive year. This conclusion is also supported by the results of the WGC's survey of central banks.

## **6. Financial markets and gold**

### **6.1. Characteristics of the global gold market**

The gold market is commonly characterized as large, global and highly liquid. It is even argued that the gold market is more liquid than several major financial markets (WGC 2023b, 2011). The global gold



market is made up of three segments: over-the-counter (OTC), exchanges and gold-backed exchange traded funds (ETF). Gold's trading volume averaged USD 132 bn per day in 2022 and increased to USD 163 bn in 2023 and further to USD 221 bn in March 2024.

The largest segment continues to be the OTC market. Its trading volume (spot and derivative contracts) averaged USD 77.8 bn daily (59% of the total gold market) in 2022 and USD 99.1 bn in 2023 (61% of the total gold market), further increasing to USD 118.8 bn in March 2024 (see Figure 22). On this market, participants trade physical gold directly on a bilateral basis. The two counterparties bilaterally agree a price and have obligations to settle the transaction with each other. For this reason, the OTC market offers far greater flexibility compared to a futures exchange that operates with standardised contract sizes, delivery dates and settlement locations (LBMA 2017). Moreover, OTC trading ensures confidentiality since transactions are conducted solely between the two parties involved. However, OTC market participants are exposed to credit counterparty risk.

Although the global gold market is decentralised, London is by far the largest centre for wholesale over-the-counter transactions. In 2023 the gold trading volume in London averaged USD 78.9 bn, which corresponds to 80% of the global OTC trading volume. The London gold market is truly international, since it attracts participants from all around the world, including the majority of central banks that hold gold. The London Bullion Market Association (LBMA) assures the quality of traded gold as it publishes the LBMA Good Delivery List, which is globally recognized as the benchmark for the quality of gold bars. The gold content of Good Delivery bars ranges from 350 to 430 troy ounces and has a minimum acceptable fineness of 995. The LBMA also sets twice daily the LBMA Gold Price, which continues to be the spot price benchmark for other markets.

On the other hand, the global gold market is also made up of a sizable “paper gold” segment, which consists of a number of derivatives that do not represent ownership of physical gold (O’Callaghan 1991; Rickards 2016). These financial instruments include gold-backed exchange traded funds (ETFs), gold futures, gold options and forward contracts. As opposed to physical gold, “paper gold” exposes investments to numerous risks, such as counterparty risk or turbulences on stock markets. That said, the second-largest component of the global gold market involves exchanges and its trading volume averaged USD 51.6 bn daily (39% of the total gold market) in 2022 and USD 61.5 bn in 2023 (37.8% of the total gold market), increasing further to USD 99.5 bn in March 2024. Lastly, gold-backed ETFs remain by far the smallest segment and the average daily trading volume amounted to USD 2.3 bn (2% of the entire market) in 2022 and USD 2 bn in 2023 (1.2% of the entire market) (see Figure 23). The development of these two segments of the non-physical gold market has opened it to a large group of investors. Moreover, as positions in these products have grown very large, the behaviour of these investors has exerted even more influence on gold prices. It is argued that the size of the gold market implies it can absorb large purchases and sales without resulting in price distortions.

## 6.2. Gold-backed ETFs

Physically-backed gold exchange-traded funds (gold ETFs) were introduced in March 2003 when Gold Bullion Limited (now ETF Securities) launched the first ever gold ETF – Gold Bullion Securities – on the Australian stock exchange. This segment of the global gold market has subsequently grown rapidly, albeit with strong fluctuations. By definition, ETF is an investment vehicle that combines key

features of traditional mutual funds and individual stocks. ETFs are open-ended funds which represent portfolios of securities that track specific indices (Spall 2009). That said, gold-backed ETFs are funds that are traded on stock exchanges like equities. They are passive investment instruments. These funds hold physical gold, typically in the form of London Good Delivery bars. In effect, investors purchasing shares in a gold-backed ETF are buying a portion of gold that the fund holds. The gold equivalent of one ETF share varies, but in many major funds usually equals 1/10 of a troy ounce (WGC 2018a). Nevertheless, investors holding ETF shares do not own actual gold. They only own “paper gold”. If they decide to redeem a gold ETF shares, they receive a cash equivalent in a designated currency, not physical gold.

Gold-back ETFs closely track the gold spot price. This allows investors to profit from gold price changes without having to own the physical asset. The ETF's price fluctuates based on the value of gold they store in a vault. As of end-March 2024, ETFs held 3112 tonnes of gold. Nevertheless, they proved to remain only a tiny fraction of total demand for gold. These funds operate almost exclusively in North America and Europe. As of end-March 2024, they accounted for 50.6% and 42.8% of total ETF gold holdings, respectively. Conversely, ETFs based in Asia accounted only for 4.7% of gold holdings.

As an investment vehicle, gold-backed ETFs offer a number of advantages and are generally perceived as convenient and cost-effective. The key motivation for launching gold ETFs was to open up the gold market to a broader range of investors. The accessibility for investors with a smaller portfolio is much greater than in the case of physical gold since a share in ETF usually represents a small fraction of a troy ounce. Therefore, it is argued that these funds “democratized” access to the gold market. Investing in gold-backed ETFs also removes logistical issues. Contrary to physical gold, there is no cost of storage and insurance as well as no risk of theft. ETFs also have greater liquidity than physical gold and enjoy lower management fees since they are managed passively (i.e. their managers do not attempt to beat the performance of gold but only match it). Gold ETFs allow investors to profit from changes in gold prices also in the short term and benefit from real-time trading. In the longer perspective, these funds can also serve as a portfolio diversifier. Their attraction for investors also stems from the fact that gold held by ETFs is allocated. Nevertheless, the drawbacks of gold-backed ETFs are not insignificant. Above all, investors do not own physical gold. There is also a counterparty credit risk since the company running a given ETF may simply default (Jagerson, Hansen 2011). Moreover, ETFs do not perfectly track the actual spot price of gold. They can be structured very differently and include shares of mining companies or shares in other gold-related funds and have different risk profiles as a result. For these reasons, only a tiny fraction of central banks decided to invest a portion of their reserves in gold-backed ETFs. According to Central Bank Gold Reserves Survey, 4% of central banks that participated in the survey held gold-backed ETFs in 2021. Subsequently, their share dropped to 2% in 2022 and 0% in 2023 (WGC 2023c).

As demonstrated in Figure 24 ETF gold holdings are strongly correlated with the changes of the gold spot price. Rising gold prices lead to inflows to this market segment and an increase in ETF gold holdings, and vice versa. However, despite relatively high gold prices, the EFTs experienced significant outflows in H2 2022 and 2023 (see Figure 25). These outflows were driven to a significant extent by the monetary policy tightening and rising interest rates in the US and Europe. However, it is expected that falling inflation would lead to interest rate cuts by major central banks which would boost the gold ETF market as a result.

### 6.3. Gold futures

Gold futures constitute the second-largest segment of the global gold market. They are standardised, binding contracts between buyers and sellers that are traded on exchanges, where a buyer agrees to purchase a specific quantity of gold at a predetermined price and date in the future (Hull 2012). As a highly liquid market, gold futures can serve as an efficient alternative to trading physical gold and they have become an important driver of gold prices. That said, derivatives have a considerable impact on the physical gold price, as they trade in large volumes and many use leverage (O'Callaghan 1991). Unlike gold-backed ETFs, gold futures represent an active form of investment. They are used for both hedging and speculation.

Hedgers use futures to manage price risk, whereas speculators accept that risk in an attempt to profit from price changes. Moreover, gold futures often serve as a hedge against inflation and a safe haven against the stock and bond market movements. They also offer advantages in terms of high liquidity (traders can easily enter and exit positions), leverage and portfolio diversification.

With regard to hedging, gold futures allow miners and industrial companies that use large amounts of gold to manufacture jewellery and electronics to manage the risk from gold's fluctuating price. Gold suppliers open short positions to lock in a selling price for their gold, whereas gold consumers open long positions to secure a purchase price for the gold they need. On the other hand, gold futures remain an important instrument for speculation as they provide traders with direct exposure to the price fluctuations of gold without owning the physical asset. Expectations of a rise in gold price result in the opening of long positions, while anticipation of a fall lead to an increase in short positions (Jagerson, Hansen 2011). Most notably, the majority of gold futures never reach physical delivery (less than 1% of the trades actually go to delivery) and most are rolled over or terminated before expiration.

Gold futures are traded on a number of exchanges around the world. Importantly, they are traded on gold derivatives markets which are separate from the gold commodities market and futures prices do not exactly follow the commodity's movements. In contrast to the OTC market, trading on exchanges is conducted within standardized parameters with regard to quantity, purity and delivery dates. The world's largest gold derivative market is the Commodity Exchange Inc. (COMEX). The merger between the Commodity Exchange Inc. and the New York Mercantile Exchange (NYMEX) in 1994 created the world's largest futures trading exchange, where it is still known as the COMEX. The COMEX physically operates in Manhattan and is a division of the Chicago Mercantile Exchange (CME). Aside from the COMEX, there are also other exchanges, of which three stand out: the Tokyo Commodity Exchange (TOCOM), the Multi Commodity Exchange of India (MCX) and the Shanghai Futures Exchange (SHFE). Characteristically, there is no widely followed gold exchange in Europe. Gold trading in Europe remains predominantly OTC.

According to the COMEX, contracts covering around 27 mn ounces of gold are traded per day on its exchange. The COMEX remains by far the largest component of the gold futures market. Although its share fluctuates, it accounted for 76% in 2022 and 72% in 2023 (see Figure 26). The second-largest gold futures market is Shanghai with a share of 20% in 2022 and 22.6% in 2023.

On the COMEX, the standard contract size is 100 troy ounces; however, there are also smaller sizes, i.e. mini contracts of 50 oz. and micro contracts of 10 oz. Each contract is quoted in USD per troy ounce and the underlying gold must have 995 purity. Futures contracts are based on expectations of future prices, the cost of carry and interest rates, investors are exposed to an additional source of variability:

the shape of the futures curve. Typically, the futures curve for gold is upward sloping (futures prices are higher than spot). In the periods of rising gold spot prices (as in the first quarter of 2024) this entire curve moves upwards, implying even higher future prices (see Figure 27).

An analysis of changes in positions can indicate market sentiment for the price of gold. Short positioning reflects bearish sentiment while long positioning reflects bullish sentiment in the gold futures' markets. As demonstrated in Figure 28, following the global financial crisis, long positions in the gold futures market have invariably been greater than short positions, implying a constant positive net position.

Although gold futures do not usually represent actual physical gold and only a tiny fraction of traded contracts are physically settled, some gold needs to be stored in vaults to carry out physical settlements. The place where delivery will be made must be specified by the exchange. As of January 2024 there were nine COMEX approved gold depositories, e.g. Brink's Inc., Delaware Depository, HSBC Bank and JP Morgan Chase Bank. COMEX-approved electronic depository warrants are required to make or take delivery. The bullion held in these depositories is divided into two categories: registered gold and eligible gold. Eligible gold refers to all metal that is acceptable for delivery against the applicable metal futures contract for which a warrant has not been issued (i.e. the owner has not made it available for delivery). Conversely, registered gold means eligible metal for which a warrant has been issued and which can be used for delivery. The size of the COMEX warrant can be 100 and 400 troy ounces having a fineness of no less than 995. As demonstrated in Figure 29, there has been a steep decrease in gold inventories from almost 40 mn oz in January 2021 to 17.5 mn oz in April 2024. Inventories have been falling evenly in both categories.

Conditions on gold futures market can also be analysed with the application of two important concepts, namely volume and open interest. Volume represents the total number of contracts that have been traded during a specific period. It reflects the activity and liquidity of a particular financial instrument. Volume is calculated by summing up the number of contracts bought and sold during a given timeframe, such as a trading day or a specific session. Volume is a measure of market activity and liquidity. Higher volume suggests increased buying and selling pressure, indicating heightened interest. Volume also represents a measure of intensity or pressure behind a price trend. The greater the volume, the more we can expect the existing trend to continue.

Table 1

General rules for volume and open interest

Price	Volume	Open interest	Interpretation
Rising	Up	Up	Market is bullish (trend confirmation)
Rising	Down	Down	Market is bearish (possible trend reversal)
Declining	Up	Up	Market is bearish (trend confirmation)
Declining	Down	Down	Market is bullish (possible trend reversal)

Source: prepared by the authors.

Open interest is the total number of open positions (both long and short) at a given point in time (usually at the end of each trading day) held by the market participants. Open interest indicates capital flowing in and out of the market. An increase in open interest suggests that new money is flooding

into the market because more traders have opened positions for the day than closed them. In contrast, a decrease in open interest indicates that money is flowing out of the market because more positions close than open. Open interest is used to determine market sentiment and the strength behind price trends. The relationship between the prevailing price trend, volume and open interest indicates the strength of the market and helps identify bullish and bearish trends.

Rising open interest combined with increasing price and volume is a sign that the prices are likely to continue to rally since new money is coming into the market. This is a sign of bullish sentiment provided that the increase in open interest is being fuelled by long positions. Falling open interest coupled with rising price and decreasing volume indicate that the buying power is drying up and sentiment is turning bearish. Falling prices combined with rising open interest suggest that short positions are on the increase and confirm a bearish sentiment. Falling prices coupled with declining open interest and volume suggest that a selling climax is nearing and the trend would reverse, therefore market sentiment is bullish (see Figure 30).

## 7. Conclusions

Gold prices are predominantly influenced by conditions on the gold market (demand and supply fluctuations), geopolitical and geoeconomic developments (notably crises), inflation rates and inflation expectations, exchange rates, and interest rates and monetary policy of major central banks. That said, gold prices have remained well above historical trends following the global financial crisis. The unprecedented rise in the gold price since November 2023 to the level of USD 2400/oz was largely driven by two factors, namely continuously rising geopolitical tensions and widespread expectations of interest rate cuts by the major central banks. Moreover, as we demonstrated in the article, gold remains highly valuable not only in US dollars and other major currencies, but also in terms of commodities such as silver, platinum, and oil.

The rise in demand for gold in the 21<sup>st</sup> century was driven by multiple factors. One of the most remarkable changes on the global gold market is the role of central banks. Over several decades after the breakup of the Bretton Woods system, central banks were selling gold held in their reserves. However, following the global financial crisis, central banks ceased to be a source of gold supply and became a significant component of global demand for gold. Moreover, the unique features of gold have been instrumental in the rise in demand for gold. Gold is a particular type of asset, since it combines properties of a commodity used, for example, in the production of jewellery and industrial applications, and a financial asset, where it is used as a store of value. That said, the rapid increase in the price of gold also reflects rising income and private demand for gold in emerging market economies, particularly in China and India (WGC 2020).

The gold market is commonly characterized as large, global and highly liquid. The largest segment continues to be the OTC market, where participants trade physical gold directly on a bilateral basis. The significant change in the global gold market in the 20<sup>th</sup> century is related to the development of the “paper gold” segment, which consists of a number of derivatives that do not represent ownership of physical gold and include gold-backed exchange traded funds (ETFs), gold futures, gold options and forward contracts. This segment has grown considerably over the last two decades. In effect, it currently exerts a significant influence on gold prices. This is particularly discernible in the case of gold futures, whereas gold-backed ETFs remain only a tiny fraction of the “paper gold” market.



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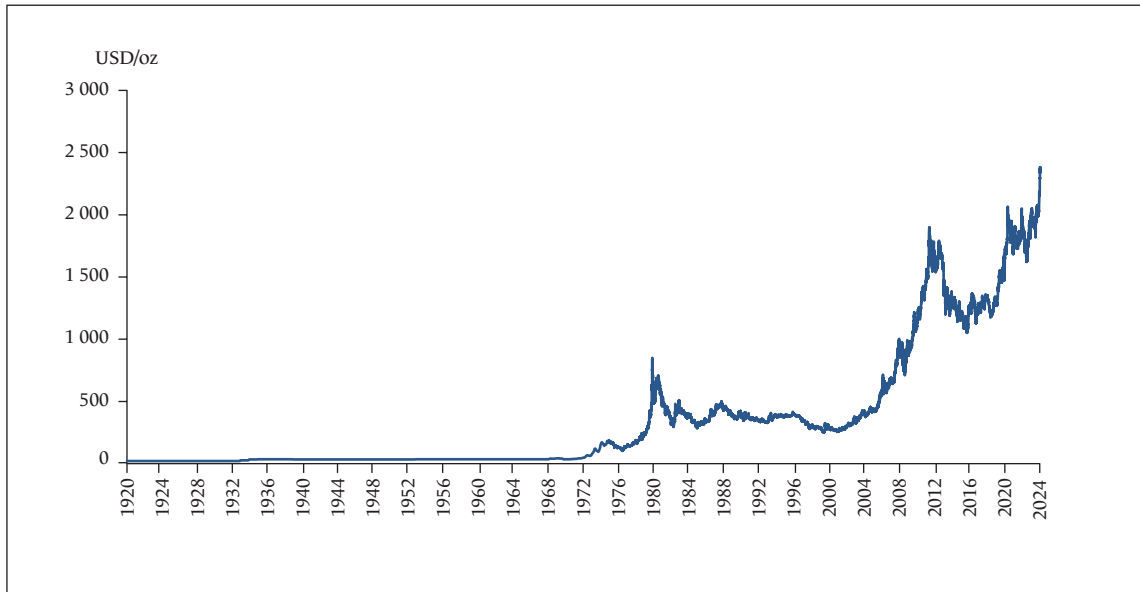
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## Appendix

Figure 1

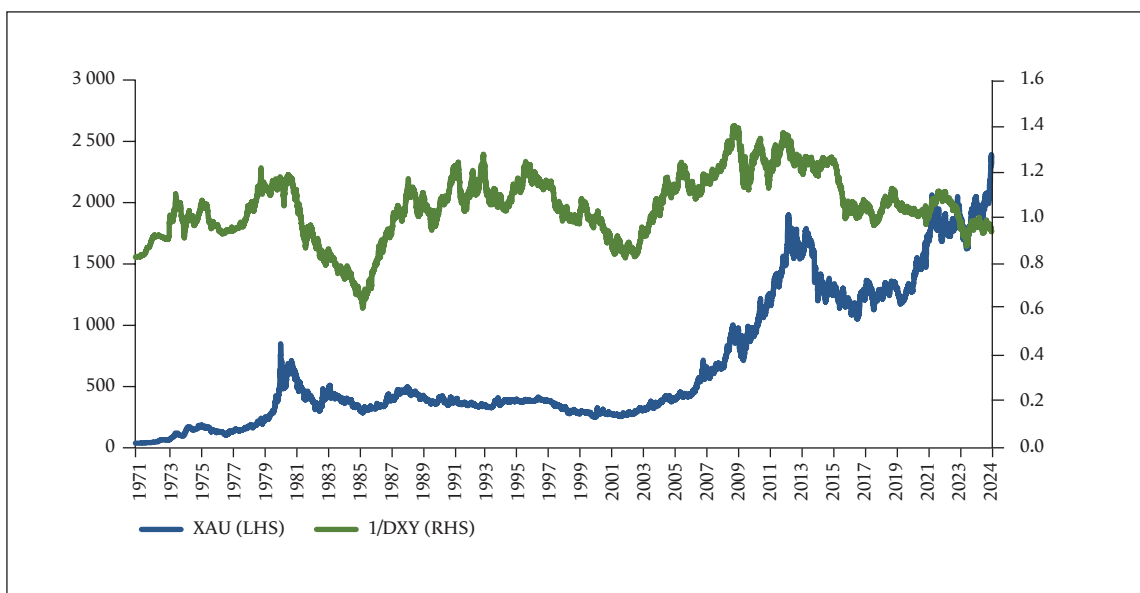
Evolution of the gold price



Source: prepared by the authors based on the Bloomberg database.

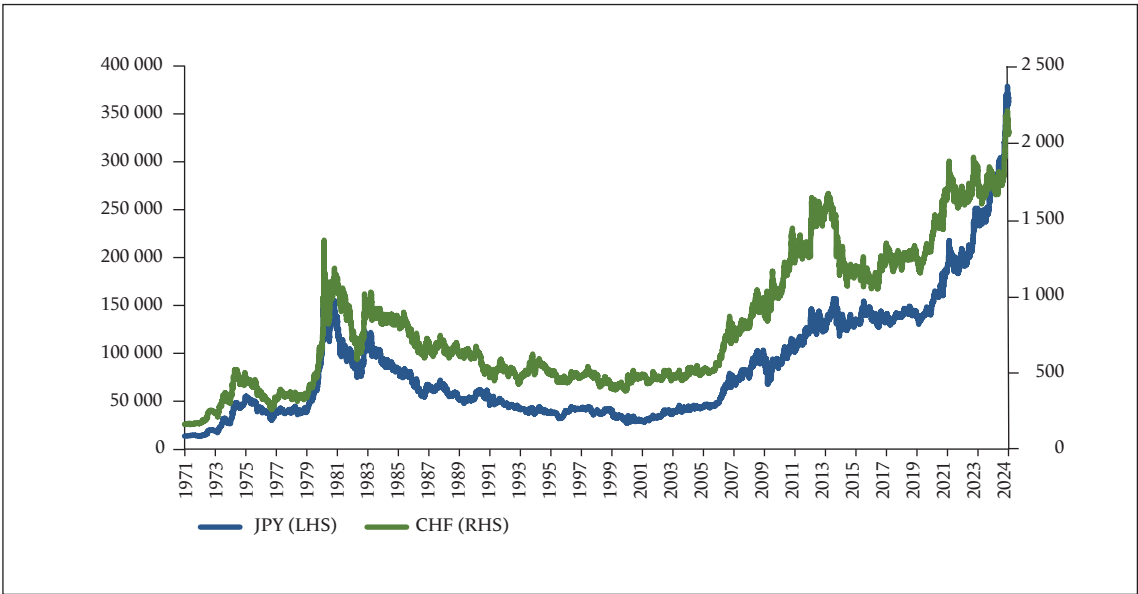
Figure 2

Gold (oz) spot price in terms of USD and the inverted Dollar Index (1/DXY)



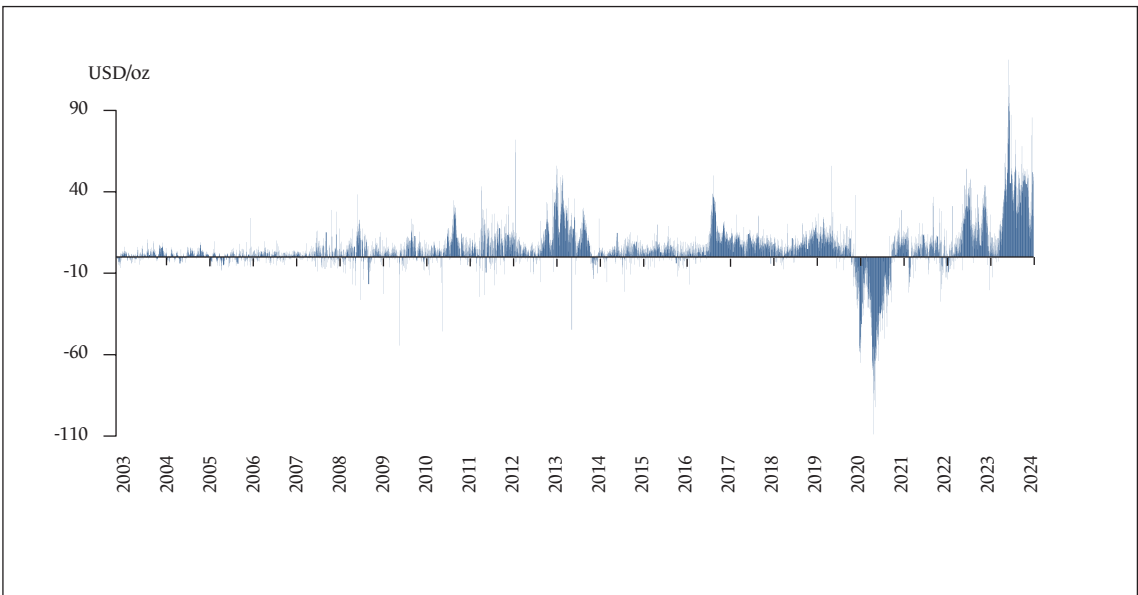
Source: prepared by the authors based on the Bloomberg database.

Figure 3  
Gold (oz) spot price in terms of CHF and JPY



Source: prepared by the authors based on the Bloomberg database.

Figure 4  
Shanghai Gold Exchange premium/discount

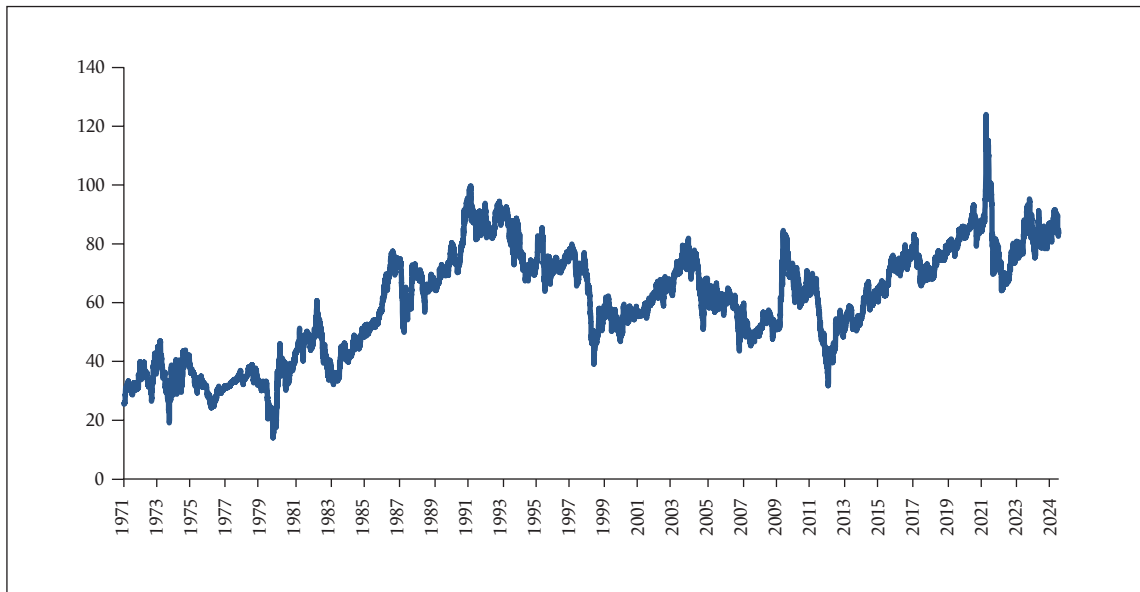


Source: prepared by the authors based on the World Gold Council database.



Figure 5

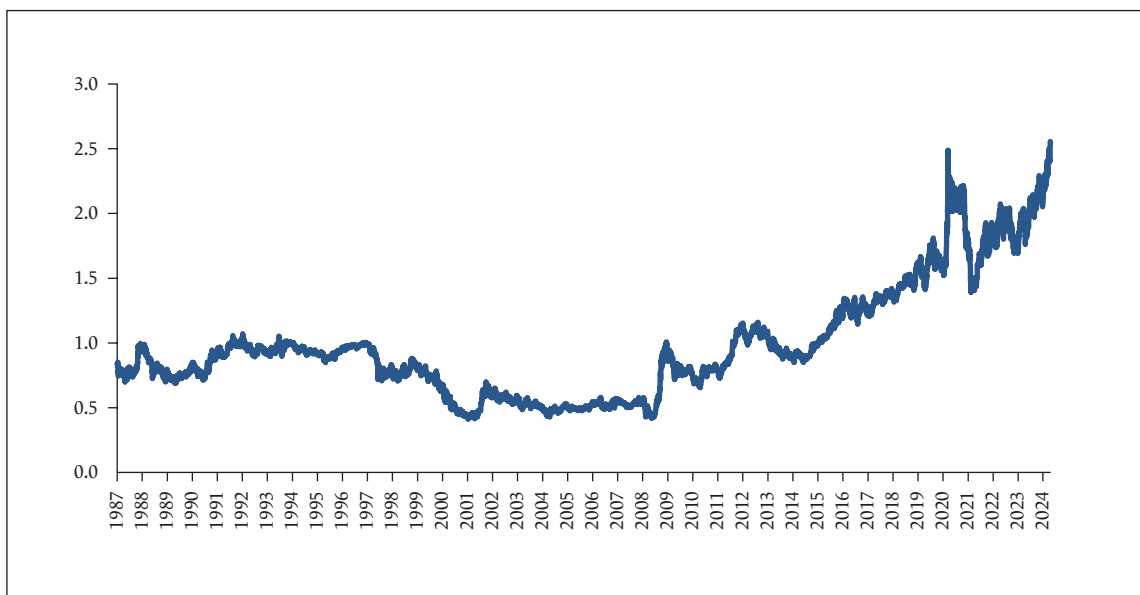
The value of gold in terms of silver (spot gold / spot silver ratio)



Source: prepared by the authors based on the Bloomberg database.

Figure 6

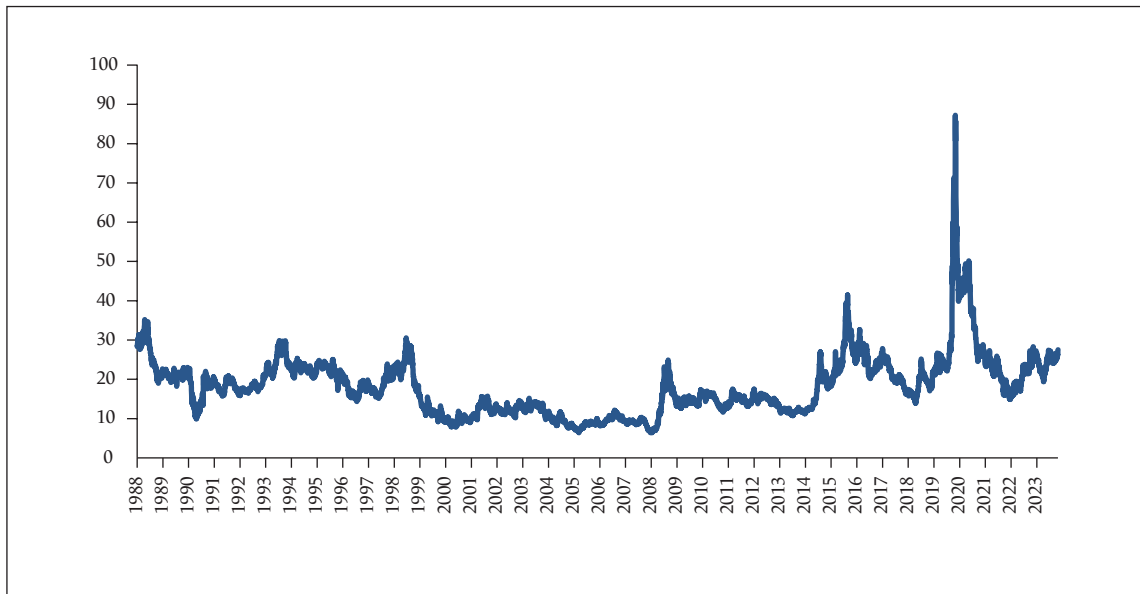
The value of gold in terms of platinum (spot gold / spot platinum ratio)



Source: prepared by the authors based on the Bloomberg database.

Figure 7

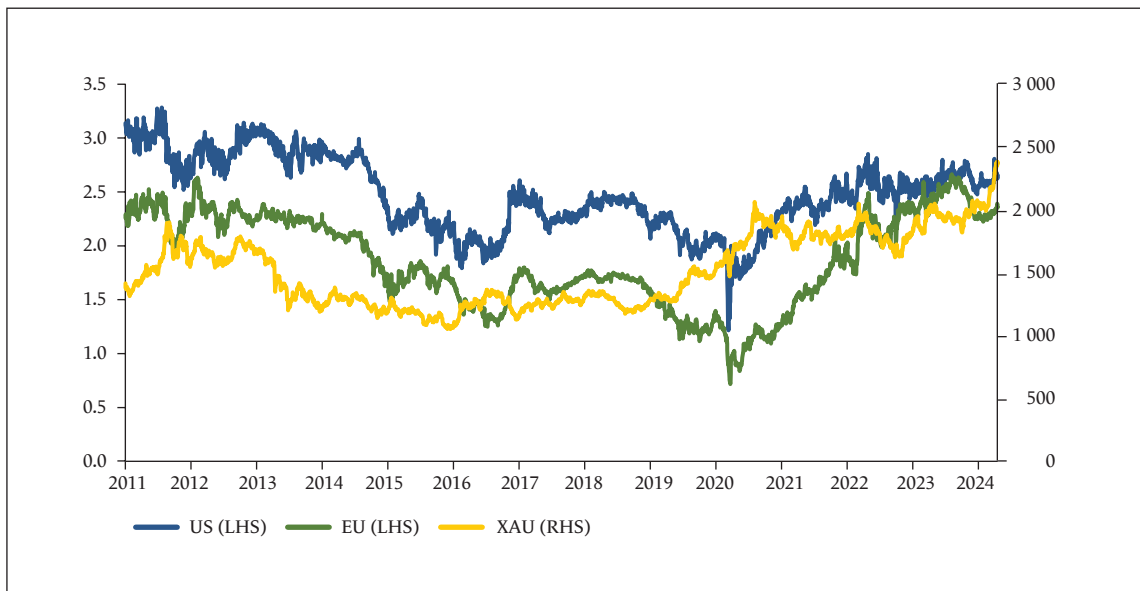
The price of gold (oz) in terms of oil (barrels)



Source: prepared by the authors based on the Bloomberg database.

Figure 8

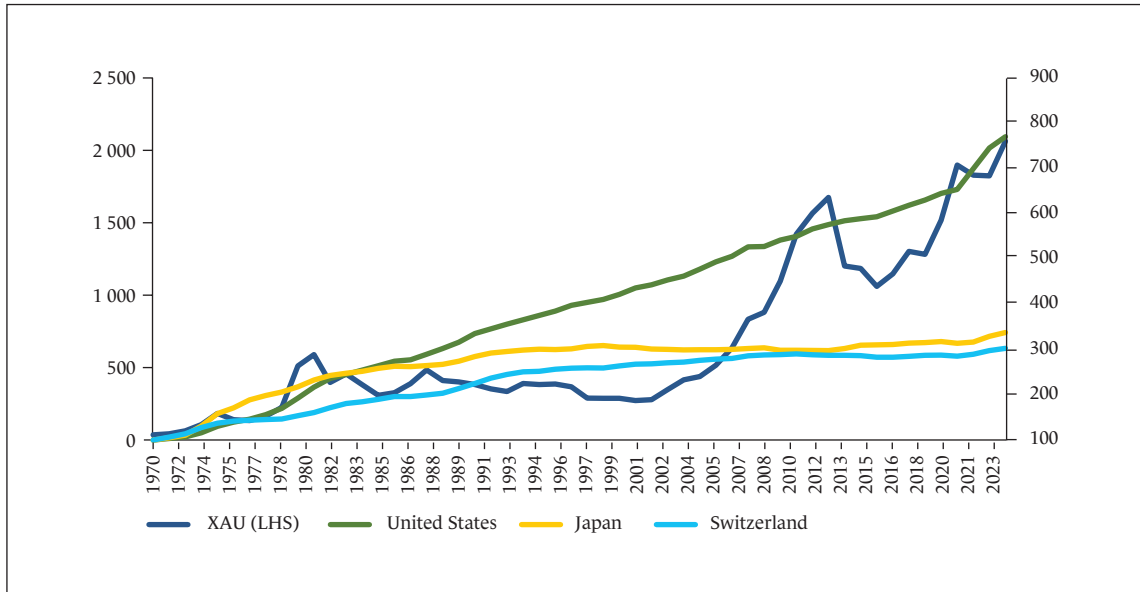
Gold price (USD) and inflation expectations in the United States and the European Union



Source: prepared by the authors based on the Bloomberg database.

Figure 9

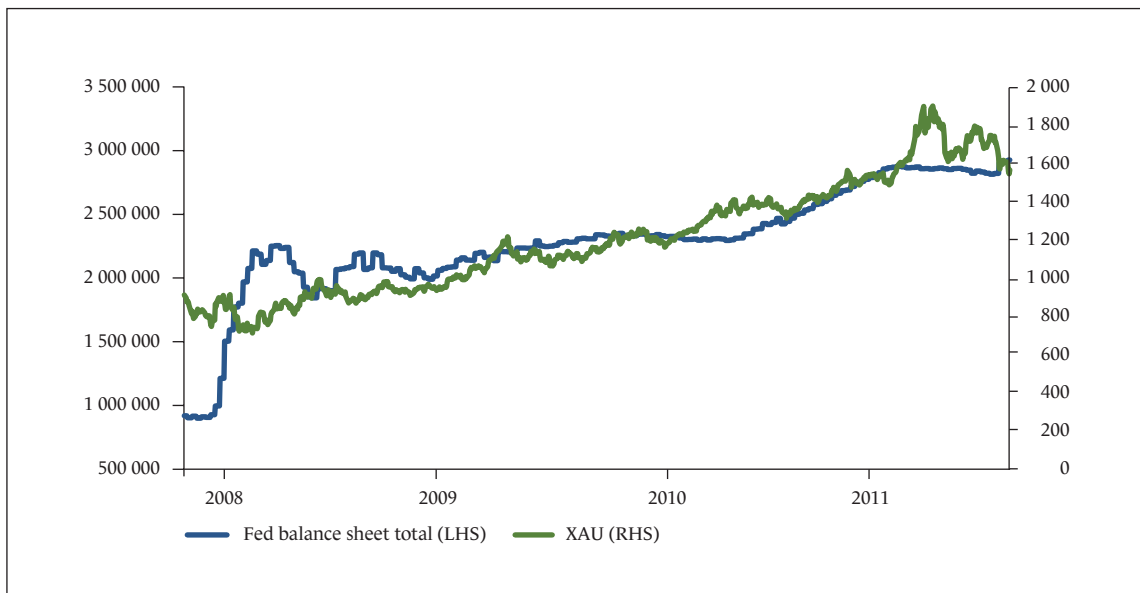
Gold spot price (XAU/USD) and cumulative inflation in the United States, Japan and Switzerland (1970 = 100)



Source: prepared by the authors based on the Bloomberg database.

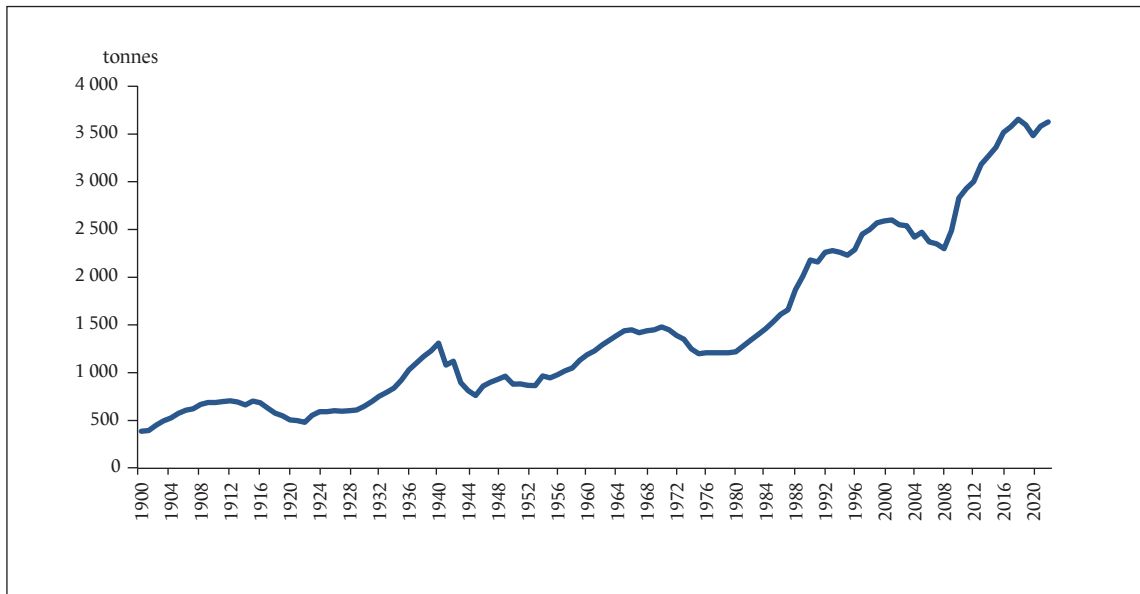
Figure 10

Gold price (XAU/USD) and Fed monetary expansion



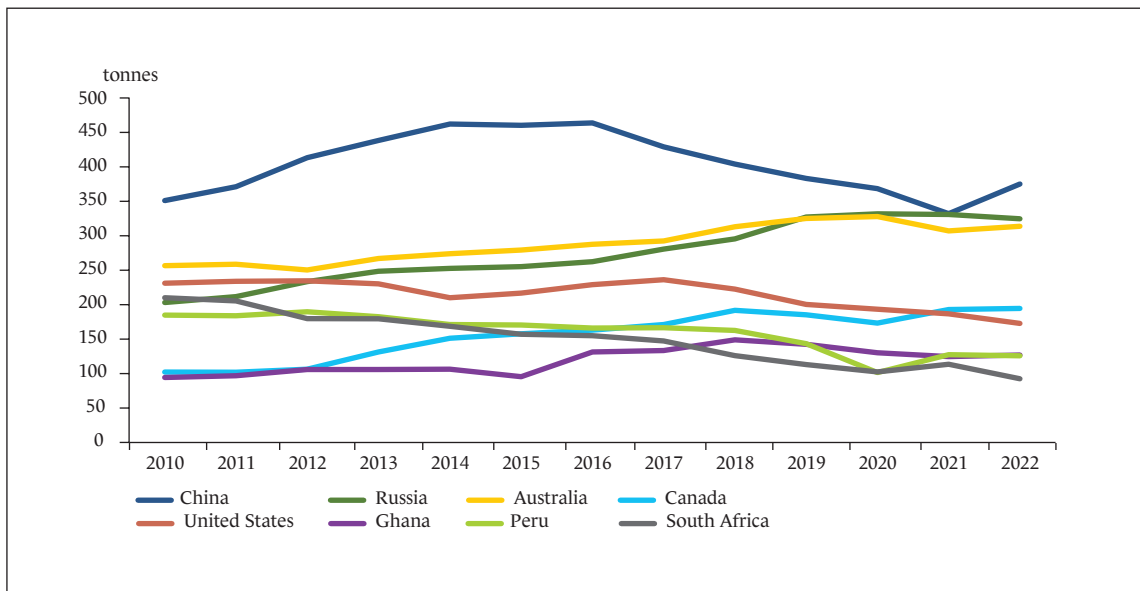
Source: prepared by the authors based on the Bloomberg database.

Figure 11  
Global gold mining



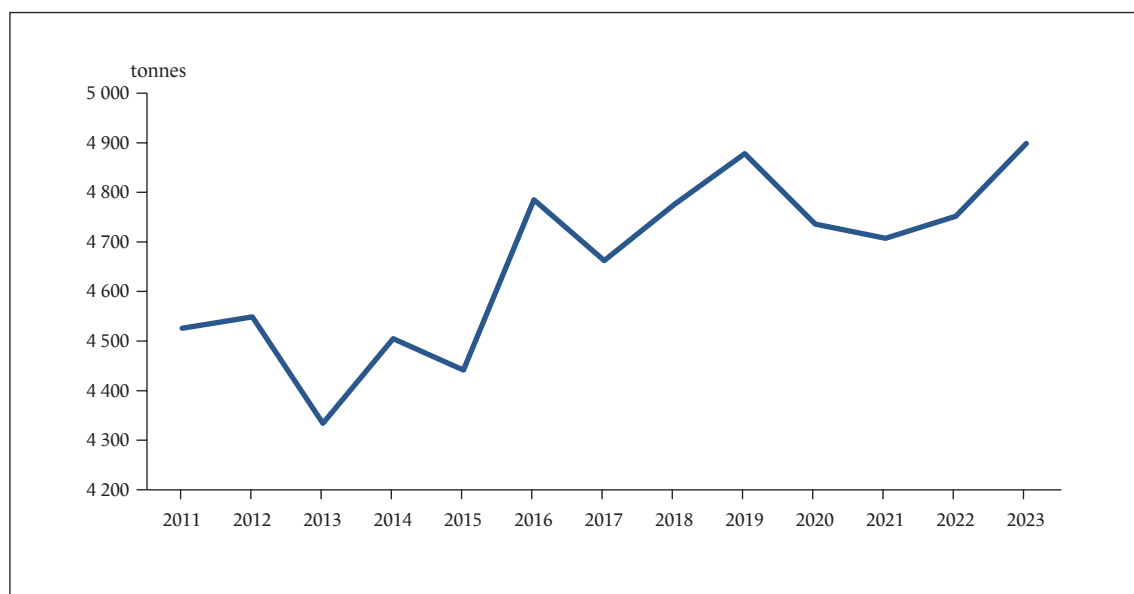
Source: prepared by the authors based on the US Geological Survey database.

Figure 12  
Countries with the largest gold mining production



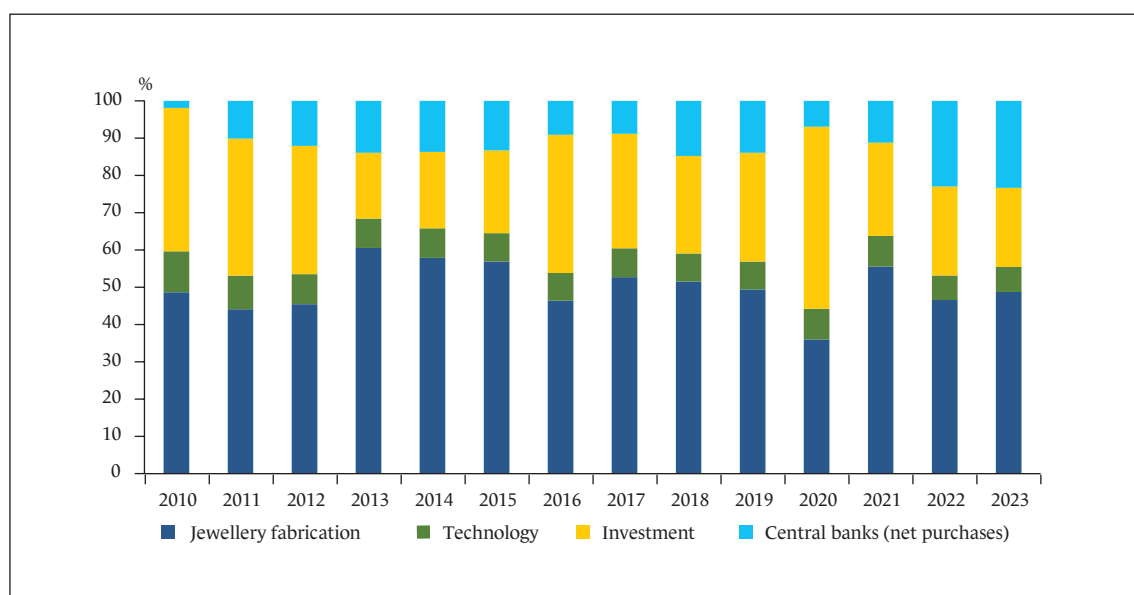
Source: prepared by the authors based on the World Gold Council database.

Figure 13  
Global aggregate demand for gold



Source: prepared by the authors based on the World Gold Council database.

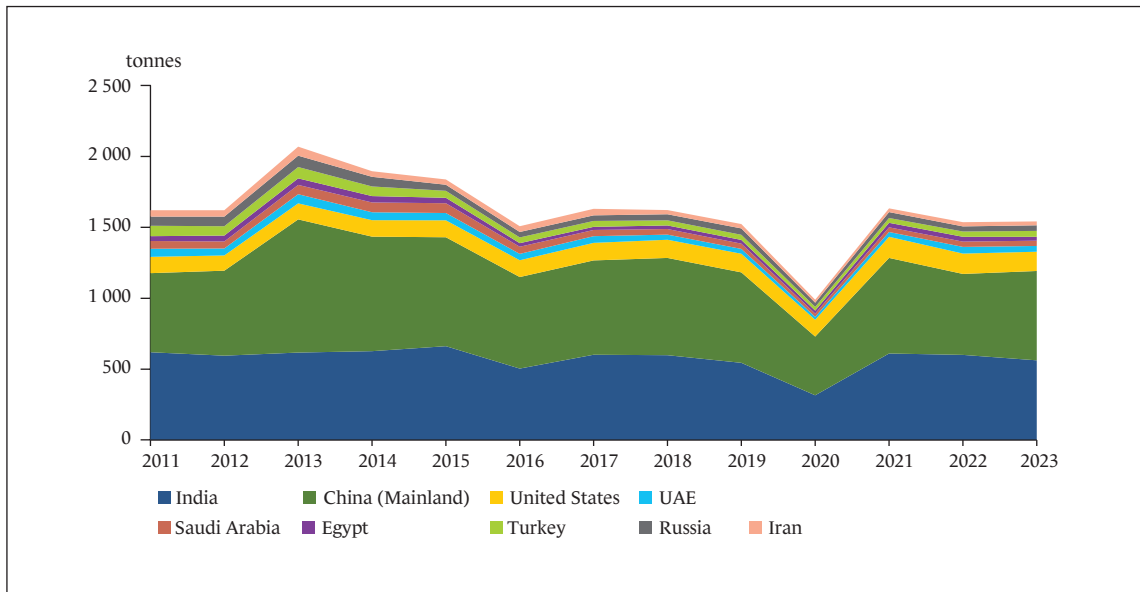
Figure 14  
Composition of global demand for gold



Source: prepared by the authors based on the World Gold Council database.

Figure 15

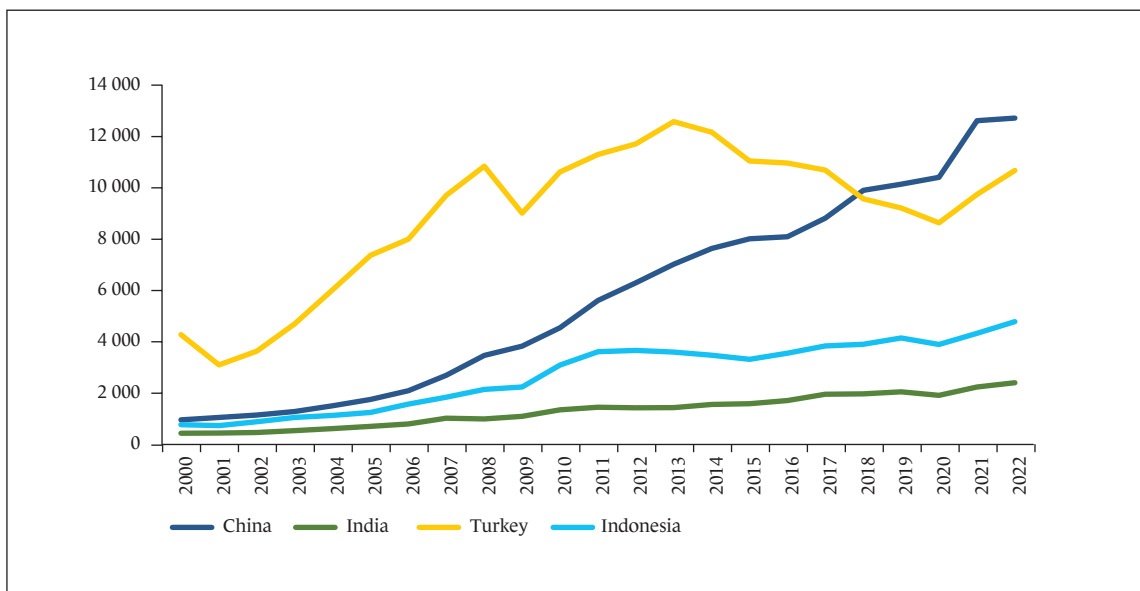
Countries with largest jewellery demand for gold



Source: prepared by the authors based on the World Gold Council database.

Figure 16

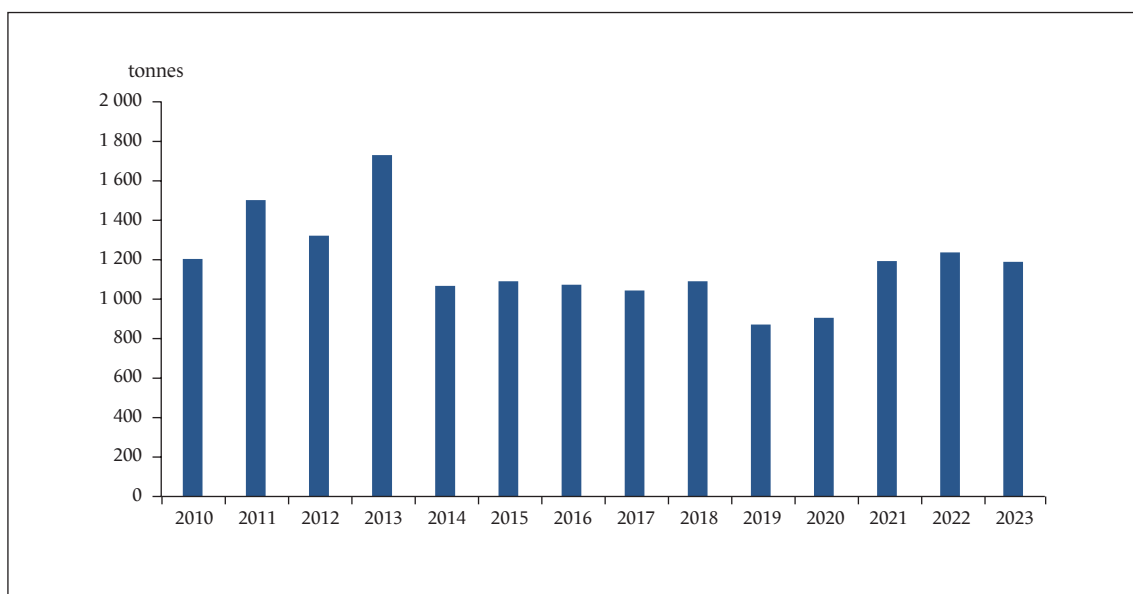
GDP per capita in selected emerging economies (current USD)



Source: prepared by the authors based on the World Development Indicators database.

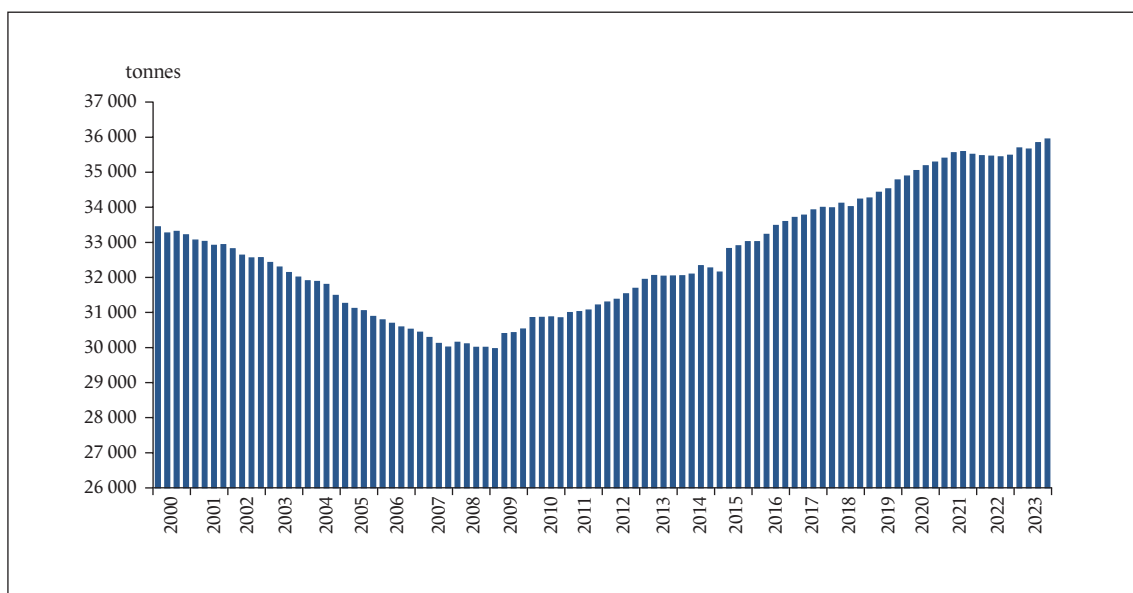


Figure 17  
Global bar and coin demand



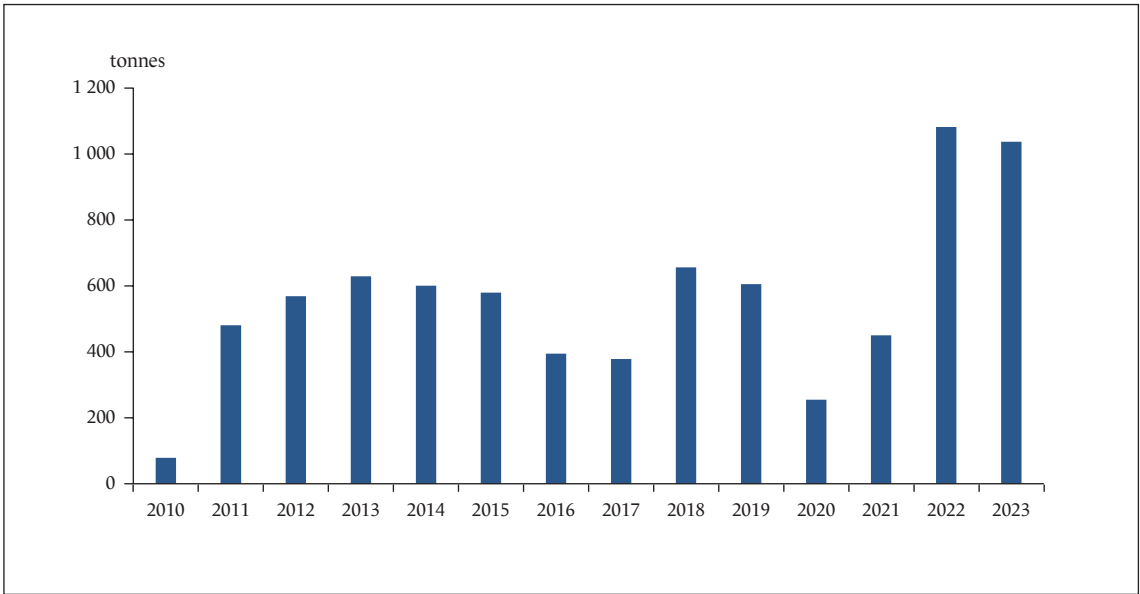
Source: prepared by the authors based on the World Gold Council database.

Figure 18  
World official gold holdings



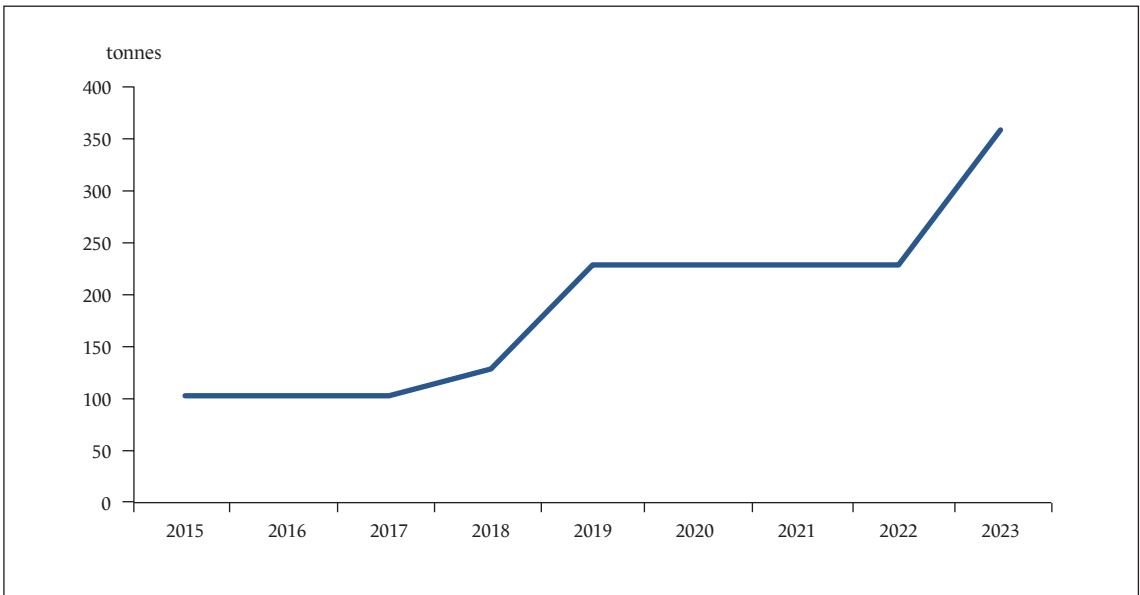
Source: prepared by the authors based on the World Gold Council database.

Figure 19  
Net central bank purchases of gold



Source: prepared by the authors based on the World Gold Council database.

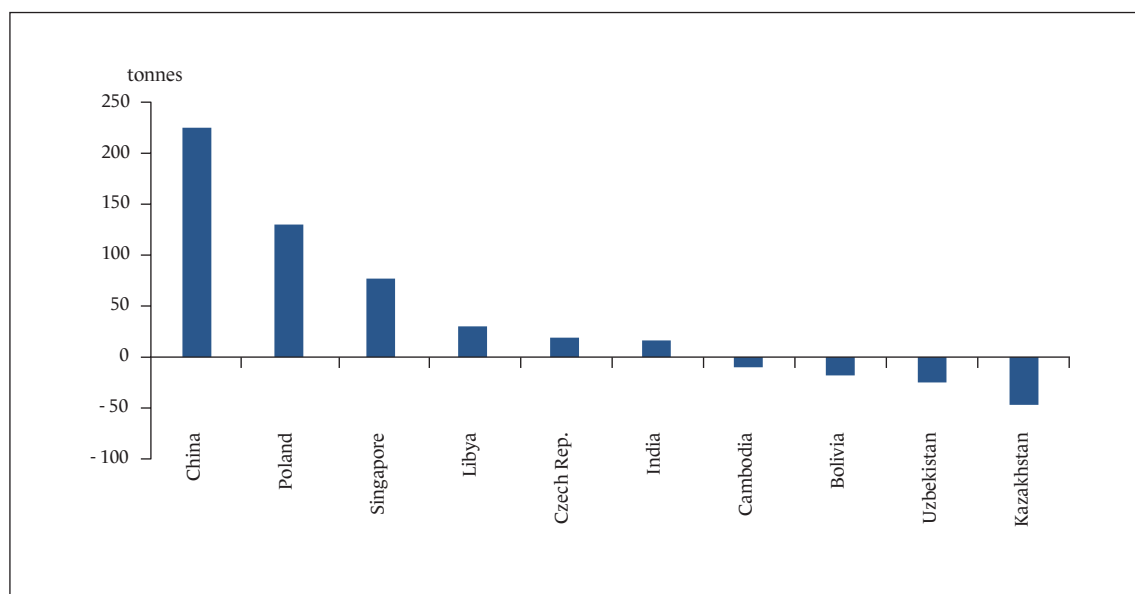
Figure 20  
NBP gold reserves



Source: prepared by the authors based on the World Gold Council database.

Figure 21

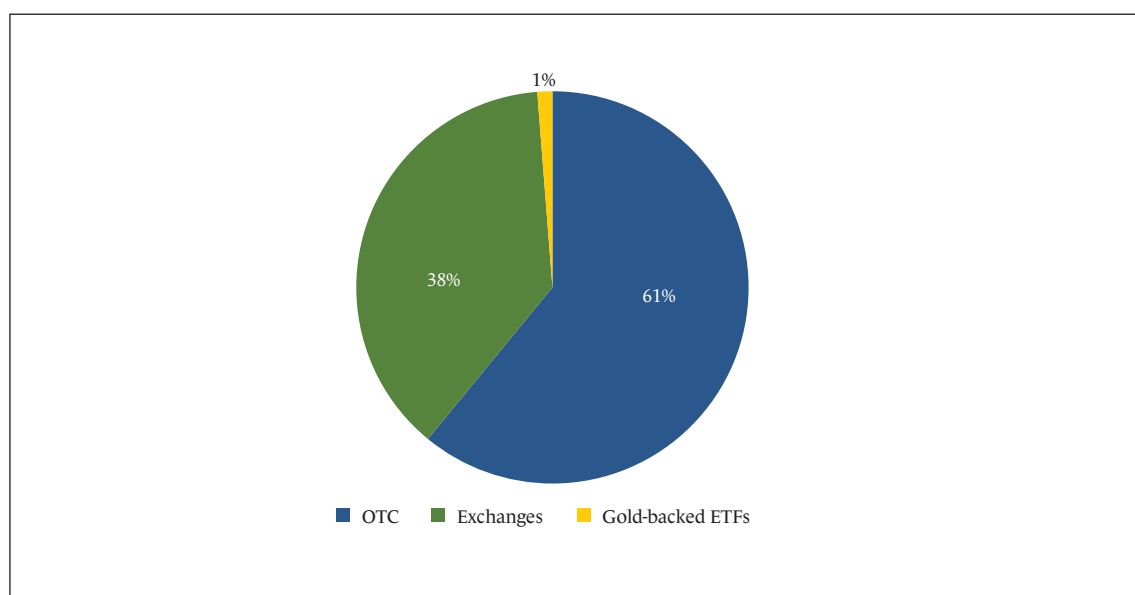
Largest central banks' purchases and sales of gold in 2023



Source: prepared by the authors based on the World Gold Council database.

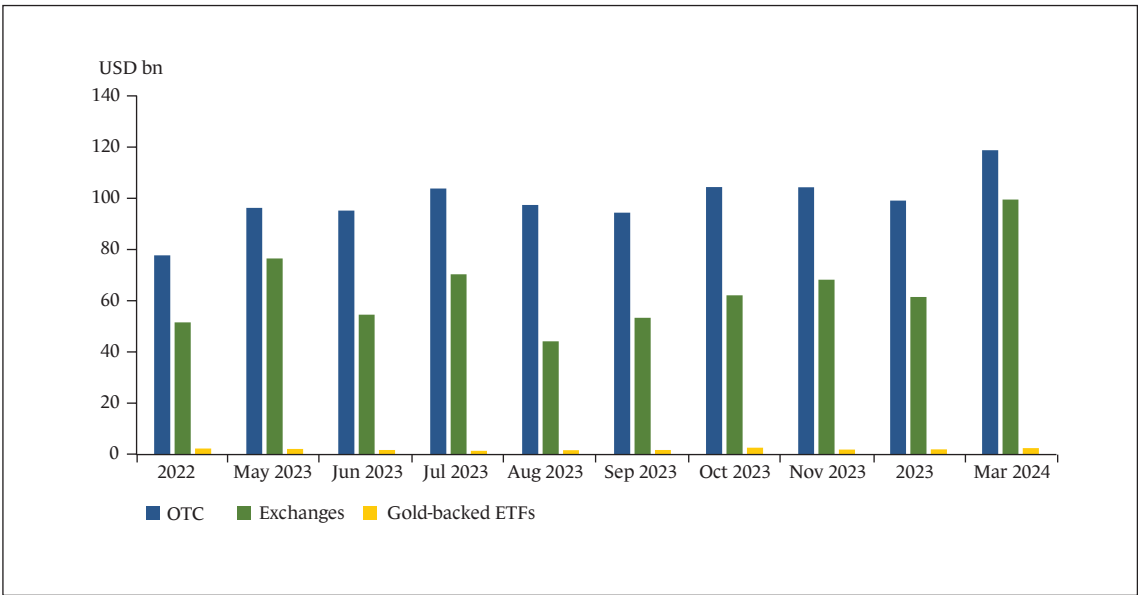
Figure 22

Structure of the global gold market (percentage of average daily trading volume in 2023)



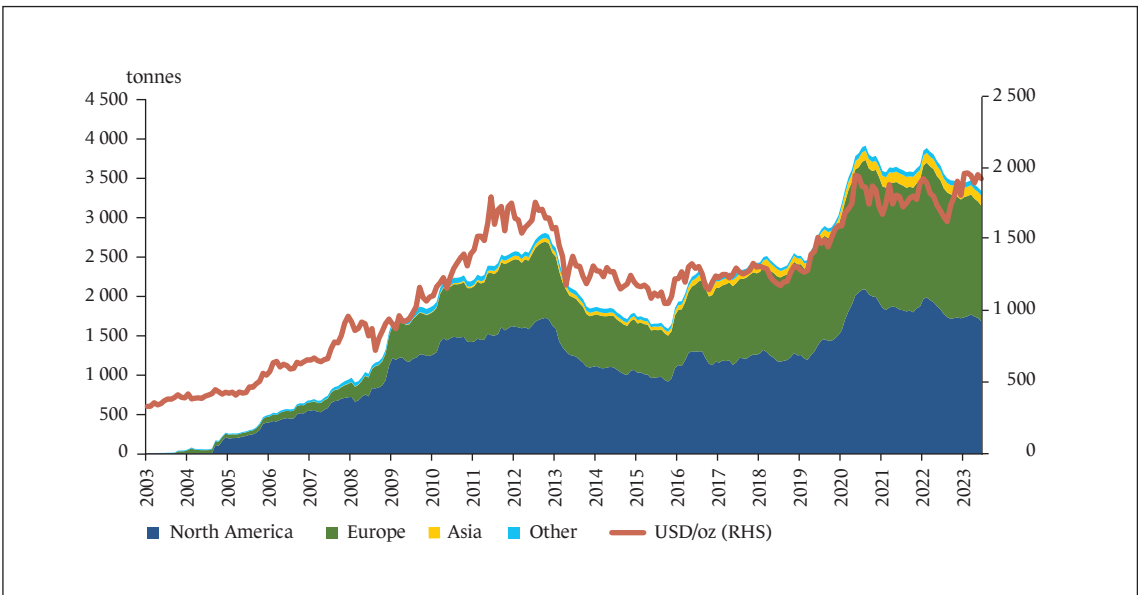
Source: prepared by the authors based on the World Gold Council database.

Figure 23  
Average trading volume in the three segments of the global gold market



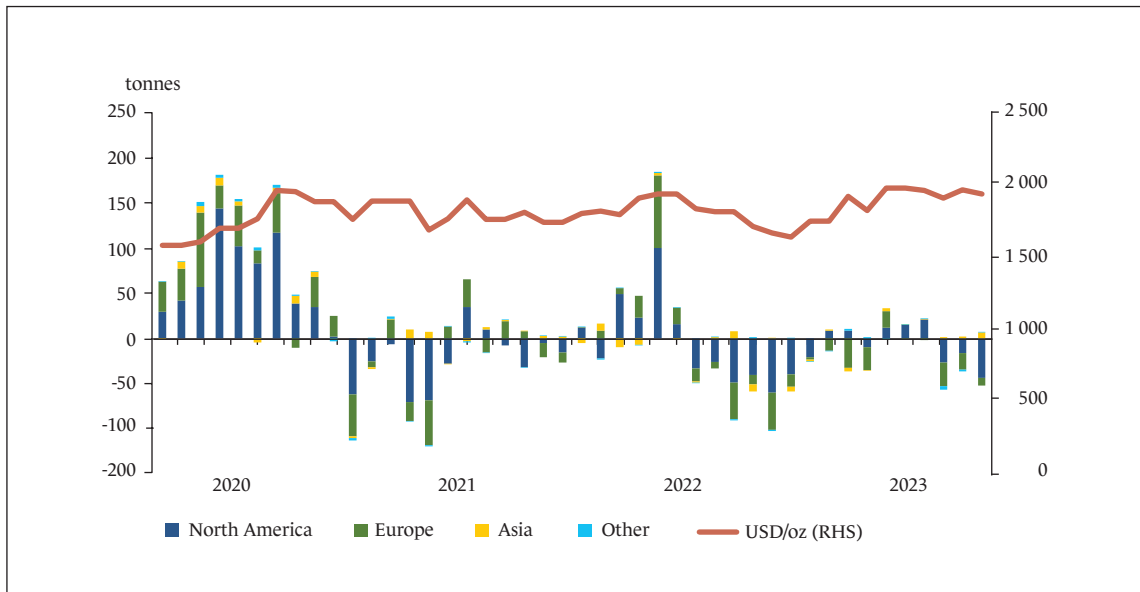
Source: prepared by the authors based on the World Gold Council database.

Figure 24  
ETF gold holdings



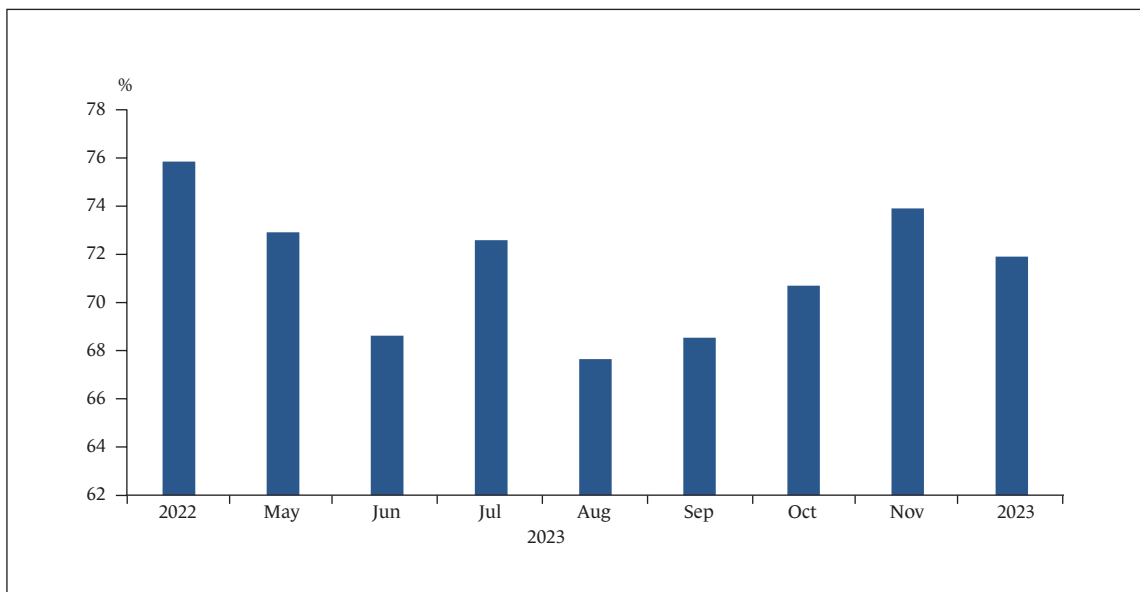
Source: prepared by the authors based on the World Gold Council database.

Figure 25  
Fluctuations in ETF gold demand



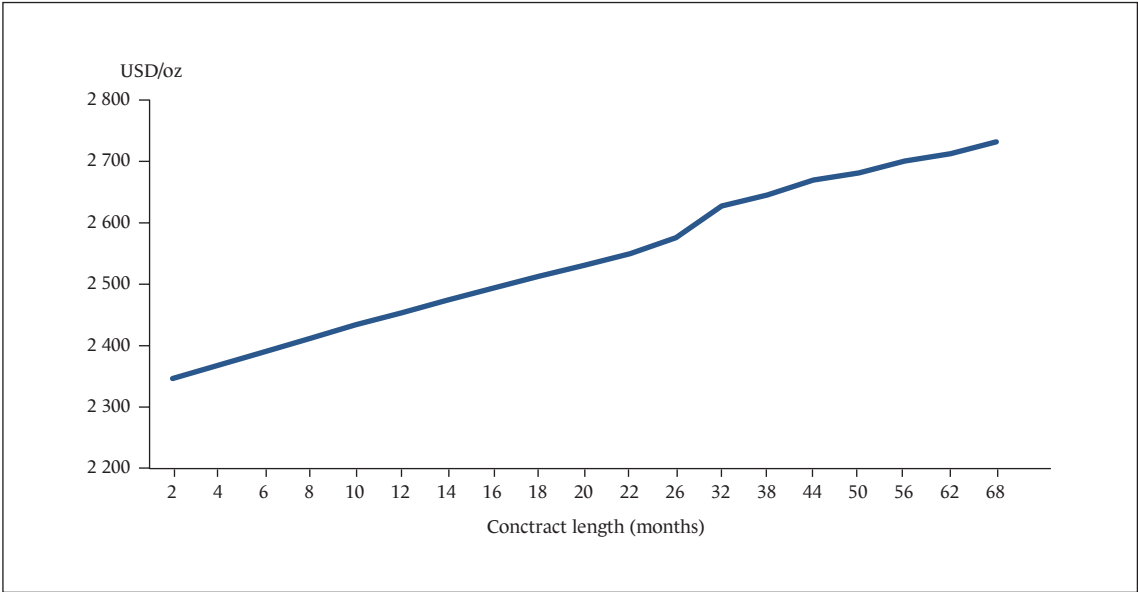
Source: prepared by the authors based on the World Gold Council database.

Figure 26  
Share of the COMEX in average trading volume on gold exchanges



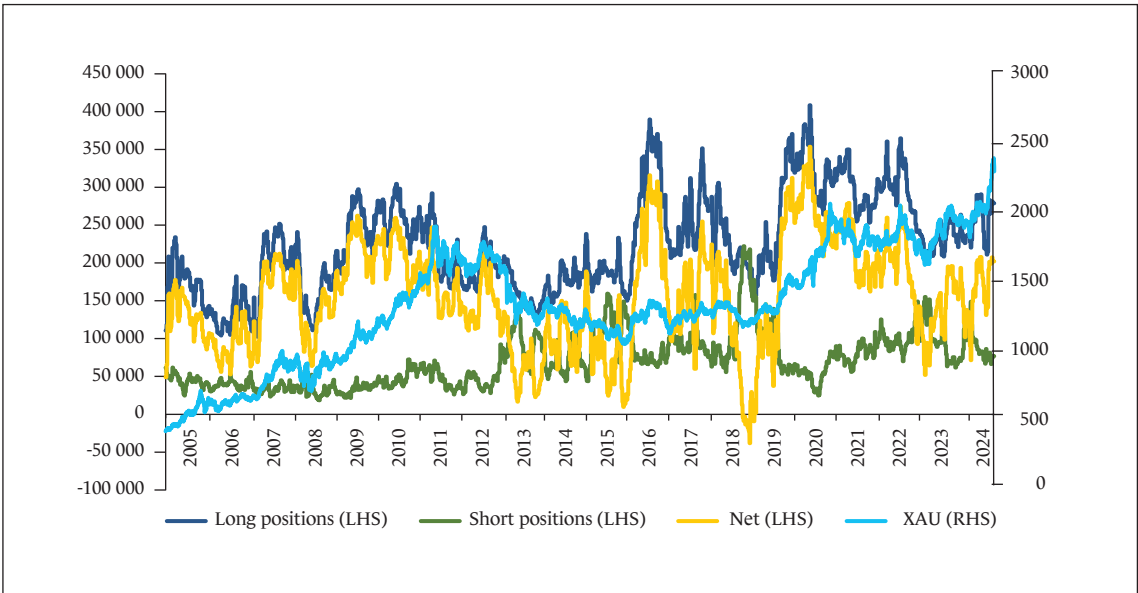
Source: prepared by the authors based on the World Gold Council database.

Figure 27  
Gold futures curve on the COMEX (as of 23 April 2024)



Source: prepared by the authors based on the CME Group database.

Figure 28  
Short and long positions on gold futures market

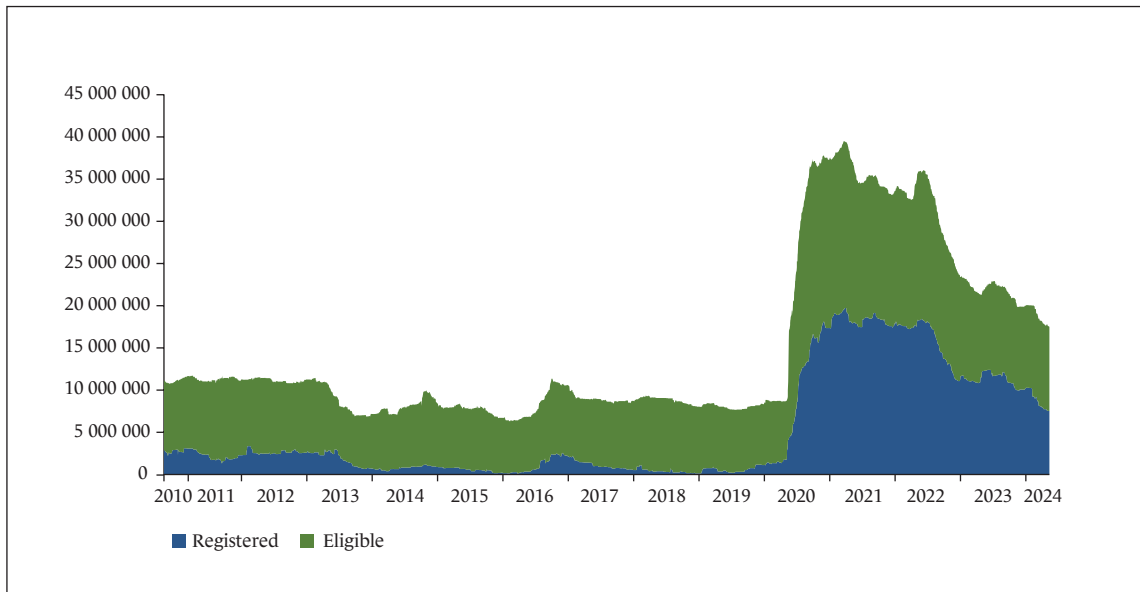


Source: prepared by the authors based on the Bloomberg database.



Figure 29

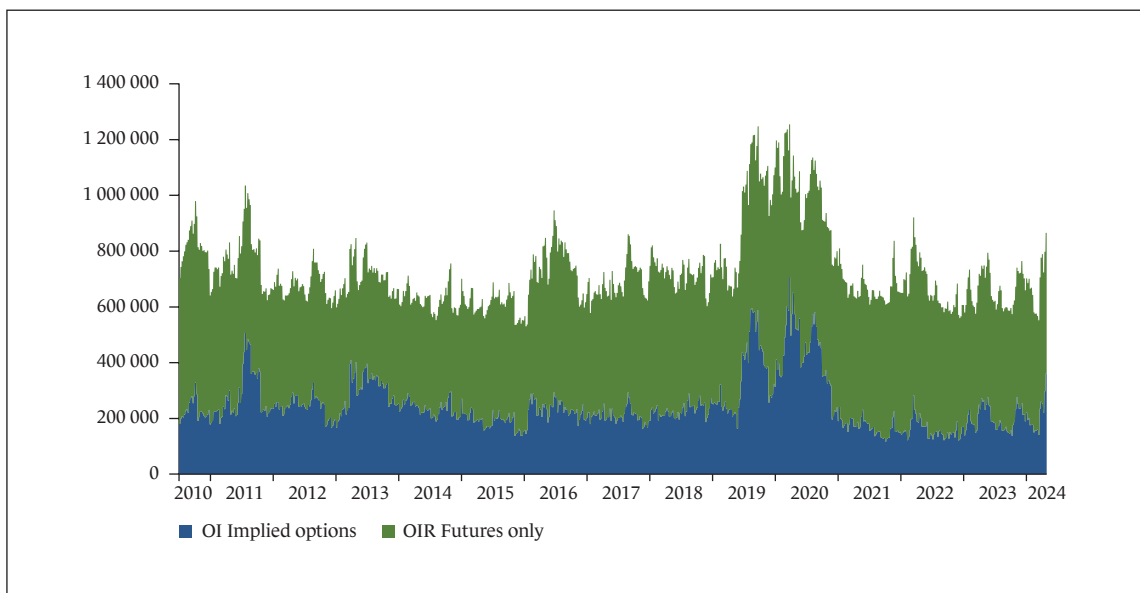
COMEX depository statistics: registered and eligible gold (troy ounces)



Source: prepared by the authors based on the Bloomberg database.

Figure 30

Gold open interest (OI) on the COMEX



Source: prepared by the authors based on the World Gold Council database.

## Procesy cenowe na światowym rynku złota

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### Streszczenie

Pomimo że złoto zostało pozbawione większości funkcji monetarnych po upadku międzynarodowego systemu walutowego z Bretton Woods, metal ten nadal odgrywa ważną rolę w gospodarce, przede wszystkim jako środek tezauryzacji i dywersyfikator portfela. Powtarzające się globalne kryzysy, coraz większa niepewność w światowej gospodarce, rosnące ryzyko geopolityczne, a ostatnio fragmentacja geoelekonomiczna przyczyniły się do renesansu zainteresowania złotem w XXI w. Jedną z najważniejszych zmian na globalnym rynku złota stała się ewolucja roli banków centralnych. Przez kilka dekad po rozpadzie systemu z Bretton Woods banki centralne sprzedawały złoto znajdujące się w ich rezerwach. Sprzedaż tę koordynowano i stopniowo ograniczano podczas kolejnych porozumień banków centralnych w sprawie złota, począwszy od 1999 r. Decydująca zmiana podejścia banków centralnych do złota nastąpiła pod wpływem globalnego kryzysu finansowego. Od tego czasu banki centralne przestały być źródłem podaży złota i stały się istotnym elementem globalnego popytu na złoto. Jednocześnie udział banków centralnych w światowym popycie na złoto wzrósł z 1,9% w 2010 r. do 23,3% w 2023 r.

Celem artykułu jest ocena wartości złota przy użyciu szerokiej gamy wskaźników, a także przedstawienie czynników determinujących ceny złota, ze szczególnym uwzględnieniem kształtowania się popytu i podaży na rynku złota oraz instrumentów finansowych opartych na złocie. Hipotezą artykułu jest stwierdzenie, że złoto pozostaje cenne i drogie zarówno w odniesieniu do walut, jak i innych towarów. Co więcej, jego rekordowe ceny są wynikiem rosnących napięć geopolitycznych i niepewności, a także wzrostu presji inflacyjnej po wielu latach niskiej inflacji. Znaczący wpływ na ceny złota wywiera również polityka pieniężna Rezerwy Federalnej i kurs dolara amerykańskiego. Jednakże w ostatnim czasie ceny złota osiągnęły rekordowe poziomy pomimo wyższych stóp procentowych, co świadczy o silnym wpływie czynników związanych ze wzrostem napięć geopolitycznych i postępującej fragmentacji gospodarki światowej. Wzrost cen złota wynika również z rosnącego poziomu dochodu oraz prywatnego popytu na kruszec w gospodarkach wschodzących, zwłaszcza w Chinach i Indiach. Widoczne jest również coraz większe znaczenie banków centralnych w kształtowaniu cen złota ze względu na ich rekordowe zakupy w latach 2022–2023. Zastosowane metody badawcze obejmują analizę statystyczno-opisową, analizę porównawczą i studium literatury.

W artykule pokazano, że rekordowym cenom złota wyrażonym w dolarze USA towarzyszy równie silny wzrost wartości złota wyrażony w surowcach, takich jak srebro, platyna i ropa. Zastosowane długie szeregi czasowe pozwalają stwierdzić, że złoto jest efektywnym środkiem tezauryzacji w długim okresie. Ponadto ceny złota utrzymywały się znacznie powyżej historycznych trendów po globalnym kryzysie finansowym. Bezprecedensowy wzrost ceny złota od listopada 2023 r. do poziomu 2400 USD/oz był w dużej mierze powodowany przez dwa czynniki, a mianowicie stale rosnące napięcia geopolityczne i powszechne oczekiwania na obniżenie stóp procentowych przez najważniejsze banki centralne.

Przedstawiony w artykule rozwój światowego rynku złota odnosi się zarówno do fizycznego złota, jak i złota „papierowego”, tj. instrumentów finansowych, w przypadku których złoto pozostaje instrumentem bazowym. W XXI w. silnie wzrósł segment „papierowego” złota, jednak w zdecydowanej mierze dotyczyło to kontraktów *futures* na złoto, podczas gdy fundusze ETF bazujące na złocie pozostają jedynie niewielką częścią rynku. Rynek pozagiełdowy (OTC) nadal jest jednak największym segmentem światowego rynku złota, co potwierdza niezmiennie kluczową rolę inwestycji w złoto fizyczne.

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**Słowa kluczowe:** cena złota, rynek złota, inflacja, polityka pieniężna, kurs walutowy

