

# Investment in gold as an example of alternative investment - in the context of capital market in Poland

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## **Abstract**

This article focuses on the issues related to the characteristics of the gold market in the world and in Poland. Its aim is to assess the effectiveness of investment in the gold market in the years 2001-2013, compared with rates of return that investors could obtain during this period by investing capital in the so-called traditional forms of investment (relating to investment portfolios, which consist of two basic classes of traditional assets: stocks and bonds). The underlying research thesis was that in the years 201-2013 investments in the gold market were more profitable than investments in traditional instruments under the conditions of the Stock Exchange in Warsaw. Methods of analysis based on tracking error (TE) and information ratio (IR) were used, designated for investment funds in the gold market in Poland. These results were compared with the values for the portfolio benchmark, which were set on the level of the market price of gold.

## **Keywords**

commodity funds, gold market, traditional and alternative forms of investment

## **Introduction**

Gold, as one of the most precious metals, has played an important role in the development of monetary systems in the world. Today it is one of the reserve assets of central banks, and individual investors are willing to use gold as a form of investment. The demand for this ore is also expressed by jewelry industry and other industries. The unstable situation in the global financial markets in recent years is one of the factors contributing to the increased interest in alternative investments, including investments in the gold market. Investments in commodity markets are among the classic alternative investments (other groups are: modern alternative investment and emotional investments). The structure of the commodities market consists of investments in precious raw materials, energy resources, industrial metals and agricultural raw materials (Mikita and Peřka, 2009, p. 173). The characteristics of alternative investments, which also distinguish them from the so-called traditional forms of capital investment, include, among others, (Leitner et al., 2007, pp.1-4): additional diversification of risk, higher potential return on investment, a longer investment time horizon, less restrictive regulations, and the investment objective which is not to achieve higher returns than the accepted benchmark, but to achieve the highest rates of return in absolute terms. Investing in gold allows, on the one hand, to increase liquidity, on the other to reduce the risks. This is due to a low or negative correlation with most traditional forms of capital investment (Daly, 2005, p. 2). There are two main ways to invest in gold - buying gold in physical form or in the form of an instrument on the financial market. Please note that the purchase of physical gold is associated with additional costs (profit margin for the Mint of Poland or a given bank should be included). Investing in gold can take one of the following forms (Mikita and Peřka, 2009, pp. 178-179): the physical purchase of gold by purchasing jewelry (price includes not only the price of the ore, but the cost of production), the purchase of coins (price depends on the ore content in the coins and numismatic value), the purchase of gold bars; the purchase of financial instruments related to the gold market: acquisition of the shares of gold mining companies, the purchase of certificates which certify gold holding and are an alternative to a deposit of gold in physical form, structured products, futures contracts and gold options, purchase of share units in gold investment funds (including ETFs – exchange-traded funds). Not all of the above forms are available to investors on the Stock Exchange in Warsaw (WSE). For example, the WSE offer lacks futures contracts on gold and other precious metals. Futures contracts may be made only on the indices, equities and foreign exchange rates. Practically the only form of investment in the gold market through the Stock Exchange are investing in closed and open-ended investment funds.

The purpose of this article is to determine the effectiveness of investment in the gold market in Poland compared to traditional forms of capital investment.

## **1. Literature overview**

Recent studies indicate a low correlation of gold price with market indices. This issue is dealt with, among others, by Jaffe (1989) who found a low correlation between the prices of gold and the S&P500 index for the period 1971-1987. In turn, Hiller et al. (2006) demonstrated that investment portfolios which include gold and other precious materials perform better than portfolios that invest capital only in financial assets. Their analysis also concluded that the portfolios that invest in gold have protective properties against the risk of sudden shocks to the financial markets. In contrast, studies of Sherman (1982) indicate that already 5-10% share in the portfolio of gold could translate into lower volatility and improve the results of investment. At this point, it is worth noting that investing in gold is not always a good alternative to stock market investments in financial assets. The analysis carried out by Baur and Lucey (2010) indicates that the gold is worth investing only in periods of rapid declines in the financial markets. At the same time, the researchers point to a short-term merits of such an investment. Cai et al. (2001) have attempted to determine the factors of micro-and macroeconomic determinants of changes in the gold market. It turned out that the reports on employment in the economy determine the gold market, as well as reports on GDP and inflation. However, the impact of macroeconomic data on the gold market is smaller than on the bond and foreign exchange markets.

## **2. Research methods**

The aim of the analysis outlined in the introduction was realized in several stages. In the first stage of the study, changes in supply and demand in the gold market in 2001-2003 were analyzed. The structure of sources of obtaining gold, as well as the structure of its use during that period were shown. Next, the potential of the gold market in the world was determined, presenting the countries and international organizations having the largest reserves of gold. In the next stage of research, the rates of return on investment in gold were compared to those achieved in the so-called traditional forms of capital investment. For this purpose, changes in market prices of gold were compared with price movements of shares in companies on WIG20. WIG-20 index

is a benchmark for the traditional forms of investment. The study used a tracking error measures and information ratio, which allowed to examine the extent of realization of investment objectives in the gold market funds. Tracking Error (TE) and information ratio (IR) are one of the tools used for quantitative evaluation of mutual funds. Both of these indicators are a relative measure of investment risk. Tracking error determines the value of the standard deviation between the rate of return generated by the investment fund and the benchmark rate of return. This relationship is represented by a formula (Shein, 2000, p. 18):

$$TE = \sqrt{\frac{\sum_{i=1}^n (R_p - R_m)^2}{n}} \quad (1)$$

where:

- TE – tracking error,
- $R_p$  – return rate of an investment fund,
- $R_m$  – return rate on the market portfolio (benchmark),
- n – number of return periods.

The higher the values of the tracking error, the greater the risk of the investment fund. Therefore, when a particular fund has a more risky policy, both the expected rate of return and the value of TE are larger. Tracking error indicator is especially helpful when evaluating funds which are managed passively, which means their main objective is the most accurate reflection of the benchmark (Miziołek, 2013, pp. 292-293). The benchmark for alternative investments analyzed will be the change in the price of gold.

Tracking error is connected to information ratio, which can be calculated from the formula (Isrealsen, 2004, pp. 423-427):

$$IR = \frac{R_p - R_m}{TE} \quad (2)$$

where:

- IR – information ratio,
- $R_p$  – return rate of an investment fund,
- $R_m$  – return rate on the market portfolio (benchmark),
- TE – tracking error (standard deviation of the active return rate).

This measure allows to specify the size of the additional return rate of a unit of relative risk. The favorable situation occurs when the value of the information ratio is as large as possible. Increased value of the additional return rate is then attributed to the unit of risk taken. Benchmark for the information ratio is always set to 0. A negative value means that the fund manager, taking additional risk, incurred a loss,

since they received a negative return (Dawidowicz, 2009, p. 210). Information ratio is useful in the evaluation of all types of investment funds.

At the end of 2013, Poland had five funds whose investment objective was mapping the price of gold: PKO Gold SFIO, Quercus Gold, Superfund SFIO Gold-Future and two Investors TFI funds - Investor Gold FIO and Investor Gold FIZ. All funds were included in the study. Data on the value of fund share units for the entire period of their operation was obtained from the websites of each investment fund (<http://www.pkotfi.pl>; <http://www.quercustfi.pl>; <http://superfund.pl/>; <http://www.investors.pl>). The study used monthly value of the share units (the value on the last day of the month in which there has been a pricing).

### 3. Research results and discussion of the results

The reported values of supply and demand for gold in the years 2001-2013, with regard to the structure of sources of obtaining gold, as well as the structure of its use during the period summarizes tab. 1. The biggest demand for gold was generated in 2012, when it amounted to 4415 tons. In 2013 there was a small, nearly 2%, decline. However, over the 2001-2013 one can observe an increase in demand for the commodity. In 2013, the largest share in the structure of demand was jewelry (50.65%) and investments (40%). On the supply side, supply from mine production prevailed throughout the period. In 2013, the mining of ore accounted for 68.4% of the supply of gold.

**Tab. 1.** Demand and supply in the gold market in the years 2001-2013

Years	Structure of demand						Structure of supply				Sum [100%]	Growth (y/y)
	Jewellery [tons]	Jewellery [%]	Investments [tons]	Investments [%]	Industry <sup>3</sup> [tons]	Industry <sup>3</sup> [%]	Mines [tons]	Mines [%]	Recycling [tons]	Recycling [%]		
2001	3 009	80.7	357	9.6	363	9.7	2 600	69.7	1 129	30.3	3 729	-
2002	2 662	79.2	343	10.2	358	10.6	2 550	75.8	813	24.2	3 363	-0.0981
2003	2 484	77.5	340	10.6	382	11.9	2 540	79.2	666	20.8	3 206	-0.0467
2004	2 616	74.4	485	13.8	414	11.8	2 420	68.8	1 095	31.2	3 515	0.0964
2005	2 718	72.4	601	16.0	433	11.5	2 470	65.8	1 282	34.2	3 752	0.0674
2006	2 298	66.9	676	19.7	462	13.4	2 370	69.0	1 066	31.0	3 436	-0.0842
2007	2 417	67.7	688	19.3	465	13.0	2 360	66.1	1 210	33.9	3 570	0,039

2008	2 192	57.5	1 181	31.0	439	11.5	2 290	60.1	1 522	39.9	3 812	0.0678
2009	1 760	50.4	1 360	38.9	373	10.7	2 450	70.1	1 043	29.9	3 493	-0.0837
2010	2 060	54.0	1 333	35.0	420	11.0	2 560	67.1	1 253	32.9	3 813	0.0916
2011	1 963	48.3	1 641	40.3	464	11.4	2 821	69.3	1 247	30.7	4 068	0.0669
2012	1 896	42.9	2 112	47.8	407	9.2	2 824	64.0	1 591	36.0	4 415	0.0853
2013	2 198	50.6	1 737	40.0	405	9.3	2 969	68.4	1 371	31.6	4 340	-0.017

Source: own study based on the reports of the World Gold Council (<http://www.gold.org>).

In addition to the supply and demand of gold, what is also essential for determining the potential of the gold market is the statistics on the holders of gold ore. Table 2 lists the top ten countries and international organizations which have the largest reserves of gold. Data refer to January 2014.

**Tab. 2.** The largest holders of gold reserves, as of January 2014 [tons, %]

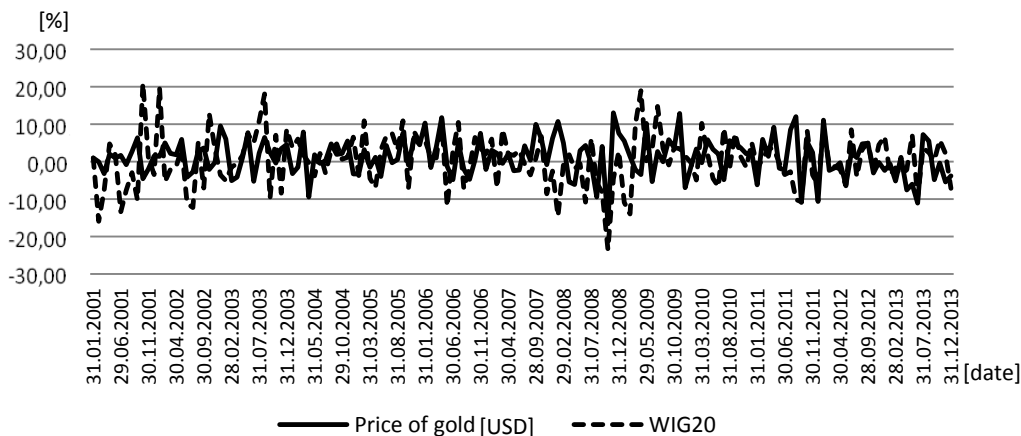
No.	Country (organization)	Gold [tons]	[%] of reserves
1.	United States of America	8 133.5	71
2.	Germany	3 387.1	67.5
3.	The International Monetary	2 814.0	no data
4.	Italy	2 451.8	66.1
5.	France	2 435.4	65.5
6.	China	1 054.1	1.1
7.	Switzerland	1 040.1	7.9
8.	Russia	1 015.1	7.9
9.	Japan	765.2	2.4
10.	The Netherlands	612.5	52.4

Source: World Gold Council (<http://www.gold.org>).

The largest holder of gold is the United States. Gold ore makes up 71% of the total reserves of the country. Interestingly, China occupies a relatively low position (6), but gold constitutes only 1.1% of its reserves. A similar situation occurs in the case of Japan.

The relationship between the price of gold and WIG20 in the years 2001-2013 shows fig. 1. In accordance with the assumptions, the price of gold exhibited greater

stability than the WIG20. This translates to greater fluctuations in prices of shares listed on the Stock Exchange.



**Fig. 1.** The relationship between the rates of return on investment in gold and in shares listed on the Stock Exchange in the period of 2001-2013 [%]

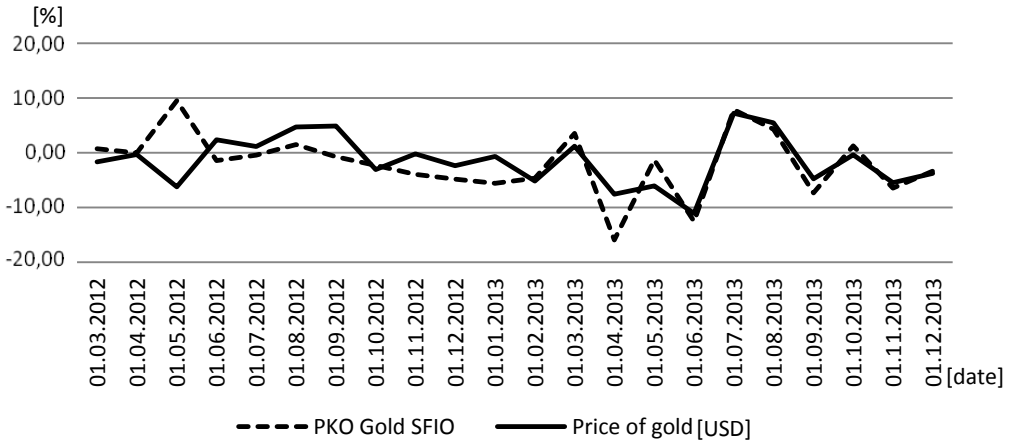
Source: own analysis.

During the biggest declines on the stock market (July-October 2008), investing in the gold market was characterized by positive rates of return of 5%. This is also confirmed by the value of the standard deviation, which for the price of gold was 5% and for WIG20 more than 7%. The difference in the standard deviation is small, but the cumulative rate of return in the case of gold is nearly 2.5 times greater than the accumulated rate of return on WIG20 (respectively 169% against 68%).

Sub-fund PKO Gold has been operating from 30<sup>th</sup> March 2012. It invests in securities that indirectly or directly reflect the changes in the price of gold. These are mainly shares in companies (66% of assets), shareholding in funds and other equity instruments related to the exploration and mining of precious metals. Fig. 2 juxtaposes the PKO Gold fund's rate of return with the prices of gold.

The main objective of the fund managers is to obtain a return corresponding to the change in price gold ore. In the first months of operation the fund developed profits, while gold prices fell. The following months proved to be worse than the standard. It was not until June 2013 that the rates of return achieved by PKO Gold SFIO began to mimic changes in the price of gold, and to meet the investment objective. Differences in the performance in the first stages of operation of the fund are reflected in the value of the correlation coefficient between the rates of return of

PKO Gold SFIO and rates of return on investment in the gold market. This coefficient was 0.6240.



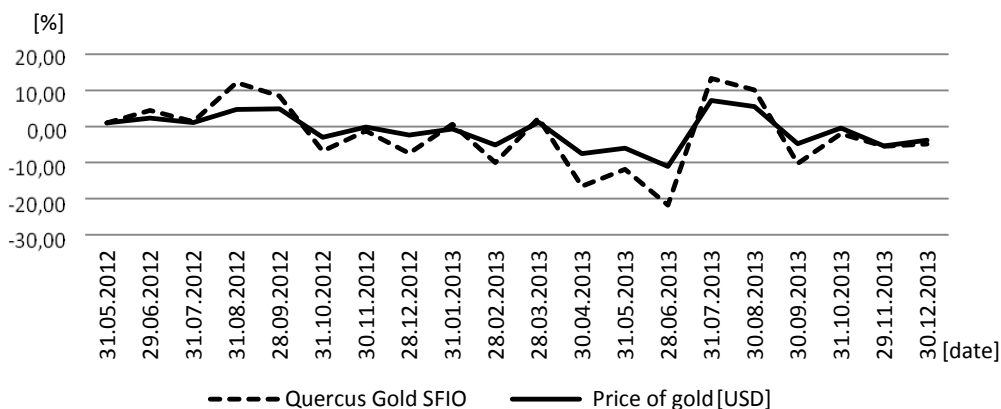
**Fig. 2.** The relationship between the rates of return of the fund PKO Gold SFIO and the price of gold in 2012-2013 [%]

Source: own analysis.

The sub-fund Quercus Gold has been operating from 7<sup>th</sup> May 2012. The objective of the sub-fund is to replicate the changes in the market prices of investment gold. Until 30<sup>th</sup> October 2013 the fund pursued the investment policy of investing in derivatives on gold - mainly in gold futures contracts traded on the COMEX market<sup>1</sup>. The remainder of the assets was invested in debt securities. However, since 31<sup>st</sup> October 2013, a change in investment strategy has been implemented. Currently *Quercus Gold* invests all the assets in the portfolio in deposits and cash. The relationship between the rates of return of the fund and the price of gold presents fig. 3.

<sup>1</sup> It's a market run by New York Mercantile Exchange.



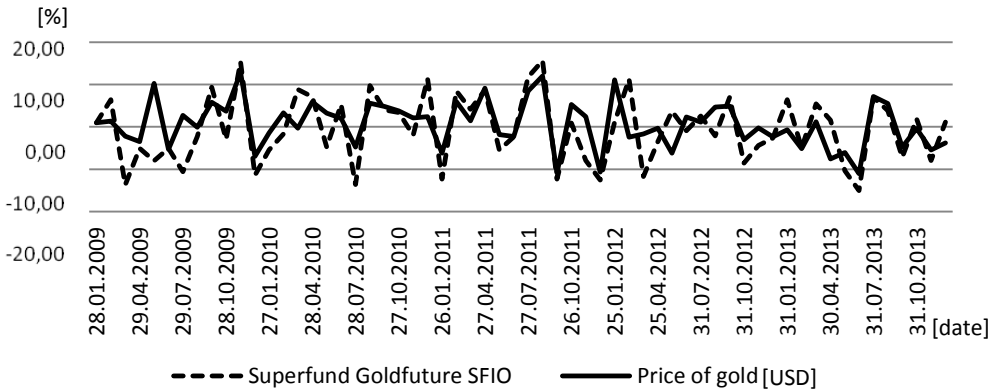


**Fig. 3.** The relationship between the rates of return of the fund Quercus Gold and gold prices in 2012-2013 [%]

Source: own analysis.

Since the start of the fund (January 1<sup>st</sup> 2009), the value of its net assets - by the end of December 2013 - decreased by over 43%. The investment objective of the Superfund SICAV is to increase the value of its assets as a result of the increase in investments value of the fund. The managers of the fund invest up to 100% of its assets in shares of Class Gold sold by the Superfund Green A USD, which is a sub-fund functioning in the framework of a foreign fund Superfund Sicav. The fund has its headquarters in Luxembourg and is a fund of the managed futures type. Assets held are invested primarily in derivatives, both directly and through participation in hedge funds, including derivative instruments for which the base is the price of gold expressed in U.S. dollars. The relationship between the rates of return of the fund and the price of gold presents fig. 4.

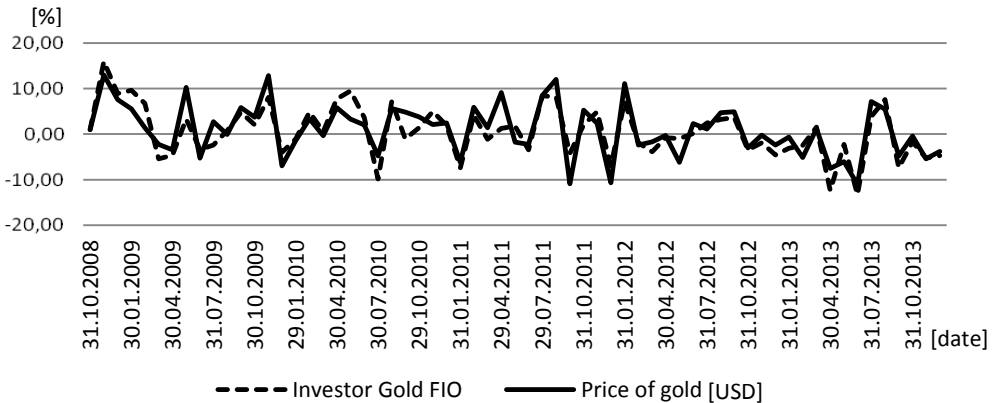
The correlation coefficient between the rates of return of the Superfund SFIO GoldFuture and the price of gold in 2009-2013 was at a low level and amounted to 0.6556, but in 2011-2013 this ratio was higher (0.7180). These values show relatively low correlation between the performance of the fund and the prices of gold.



**Fig. 4.** The relationship between the rates of return of the Superfund SFIO GoldFuture and the price of gold in 2009-2013 [%]

Source: own analysis.

The fund has been operating since 2008, and it invests in share units (from 70% to 100% of total assets) issued by the sub-fund DWS Invest Gold and Precious Metals Equities of a foreign fund DWS Invest, or in share units of the fund DWS Gold Plus. The remaining funds are invested in debt securities and money market instruments issued by the Treasury, enterprises and in bank deposits. DWS Gold Plus Fund invests in equity securities, and from 20% to 50% of its assets are invested in certificates based on precious metals price indices.



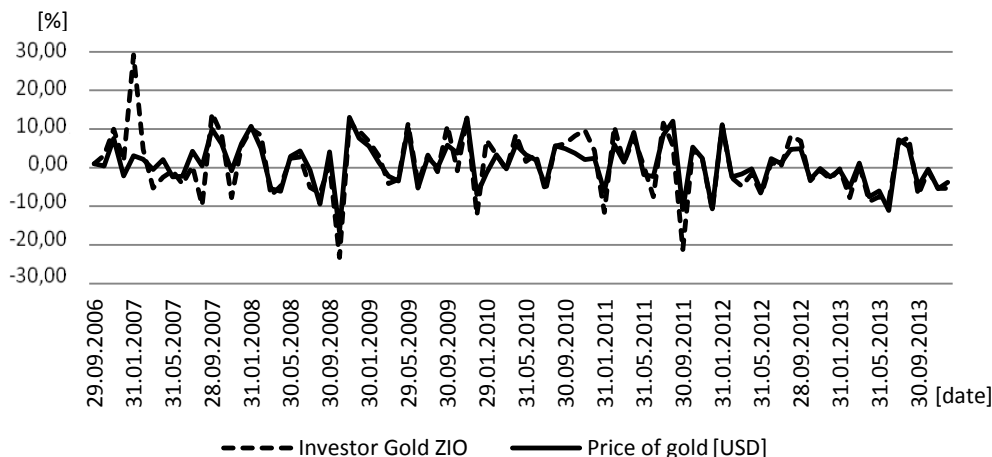
**Fig. 5.** The relationship between the rates of return of the fund Investor Gold FIO and the price of gold in 2008-2013 [%]

Source: own analysis.

The relationship between rates of return of Investor Gold FIO and the prices of gold presents fig. 5. It turns out that the fund was strongly correlated with the gold market (correlation coefficient was 0.9381), which meets the investment objective. There was a relatively low level of standard deviation - 5.6% for the fund and 6.2% for the price of gold.

The fund was launched in October 2006. The fund's portfolio consists primarily of standardized derivatives whose price depends directly or indirectly on the market price of gold, silver, platinum and palladium. The fund may also invest in shares of companies operating in the exploration and mining of gold, silver, platinum and palladium. The fund invests in assets largely outside the Polish market. Derivatives are traded principally on exchange markets in the United States, and the commodity shares are traded on the London Stock Exchange and Toronto.

Fig. 6 contains a juxtaposition of the rates of return of the fund Investor Gold FIZ with the prices of gold. The fund has met its investment objective and reflects the volatility of the price of gold up to 93% (correlation coefficient 0.9299). Standard deviation values also proved to be related - the Investor Gold FIZ fund's is at a level of 6.2%, and the price of gold was 7.6%.



**Fig. 6.** The relationship between the rates of return of the fund Investor Gold FIZ and the price of gold in 2008-2013 [%]

Source: own analysis.

The values of the tracking error and information ratio for the funds included in the study shows tab. 3.

**Tab. 3.** Tracking Error (TE) and Information Ratio (IR) of investment funds

	The name of the investment fund										
	PKO Gold SFIO		Quercus Gold		Superfund SFIO GoldFuture		Investor Gold FIO		Investor Gold FIZ		
	TE	IR	TE	IR	TE	IR	TE	IR	TE	IR	
2005	0.0390	-0.7071	-	-	-	-	-	-	-	-	-
2006	0.0677	-0.2887	-	-	-	-	-	-	0.0164	1.3783	
2007	0.0445	-0.6062	-	-	-	-	-	-	0.0919	0,0336	
2008	0.0970	0.05163	-	-	-	-	0.0148	0.9580	0.0300	-0.3031	
2009	0.0633	-0.1272	-	-	0.0725	-0.5370	0.0605	-0.1198	0.0238	-0.0638	
2010	0.0267	-0.9010	-	-	0.0597	-0.0630	0,0336	0.0755	0.0329	0.6265	
2011	0.0804	-0.0418	-	-	0.0426	-0.3215	0.0398	-0.1108	0,0436	-0.3847	
2012	0.0680	-0.1359	0.0401	0.1059	0.0729	-0.1829	0.0234	-0.3124	0.0165	-0.1808	
2013	0.0344	-0.2234	0.0518	-0.4100	0.0444	0.2397	0.0260	-0.2759	0.0159	-0.3099	

Source: own research.

The values of the tracking error determined for each were low (do not exceed the value of 0.1), which is consistent with the passive nature of these funds. The low value of the index indicates a good representation of the benchmark (gold price). However, most of the reported values of the information ratio were negative. This means that the use of the passive investment strategies by the fund managers has resulted in the lack of an additional return rate. Negative values of information ratio indicate that losses were incurred by the fund managers when taking additional risks.

## Conclusions

The analysis allowed us to formulate general conclusions. In the years 2001-2013, investments in gold proved to be more profitable than the traditional placement of capital in the market, represented by WIG20. The standard deviation of the price of gold was 5% and for WIG20 more than 7%. The cumulative value of the rates of return was also advantageous for the gold market – 169% and 68% respectively. However, in Poland, investors do not have much choice in the form of investment on the gold market. One of the possibilities is the placement of capital in com-

modity funds that specialize in investing in gold ore. The analysis showed that commodity funds meet the investment objective and follow the changes in the market price of gold. Very low values of the tracking error confirm the passive nature of the commodity funds management. The values of the information ratio were mostly negative, which means that as a result of the use of passive investment strategy, management did not work out an additional rate of return.

Investments in the gold market allow to diversify portfolios and reduce market risk. Investors seeking an alternative forms of investment to traditional markets, have the ability to locate capital in the gold market, via commodity funds among others. Gold funds operating in Poland realize their investment objective and reproduce the price of gold well. While at the moment the alternative investment market in Poland is still in the development phase, it can be assumed that the lack of stability in the traditional financial markets will translate into popularizing this form of investment and into making its new forms available to the investors.

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## **Inwestycje w złoto jako przykład inwestycji alternatywnej w kontekście rynku kapitałowego w Polsce**

### **Streszczenie**

W niniejszym artykule skupiono się na zagadnieniach związanych z charakterystyką rynku złota na świecie oraz w Polsce. Podjęto próbę oceny efektywności inwestycji na rynku złota w latach 2001-2013 w porównaniu ze stopami zwrotu, które inwestorzy mogli uzyskać, lokując kapitał poprzez tradycyjne formy inwestowania. Poddano również analizie osiągnięte współczynniki korelacji, odchylenia standardowego oraz błąd odwzorowania (TE) i wskaźnik informacyjny (IR) towarzyszące uwzględnionym w badaniu funduszom inwestycyjnym rynku złota. Wyniki te zestawiono z wartością wykorzystanych w analizie wskaźników uzyskanych dla portfela wzorcowego, za który przyjęto ceny na rynku złota. Przybliżono możliwości inwestycyjne na rynku złota w Polsce oraz postawiono hipotezę, która stanowi, iż w uwzględnionym okresie inwestycje na rynku złota były bardziej zyskowne niż w przypadku inwestycji na rynku giełdowym, jak i założono, że fundusze surowcowe lokujące kapitał na rynku złota spełniły swój cel inwestycyjny i były silnie skorelowane z cenami złota.

### **Słowa kluczowe**

fundusze surowcowe, rynek złota, tradycyjne i alternatywne formy inwestowania

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