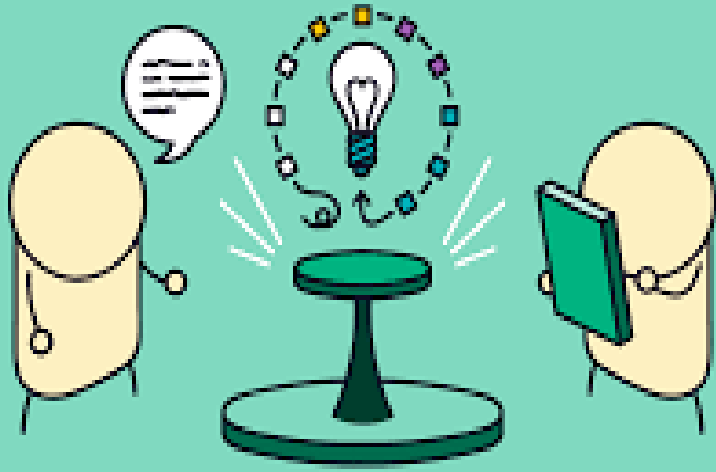




GOLD PRICE PREDICTION/FORECASTING

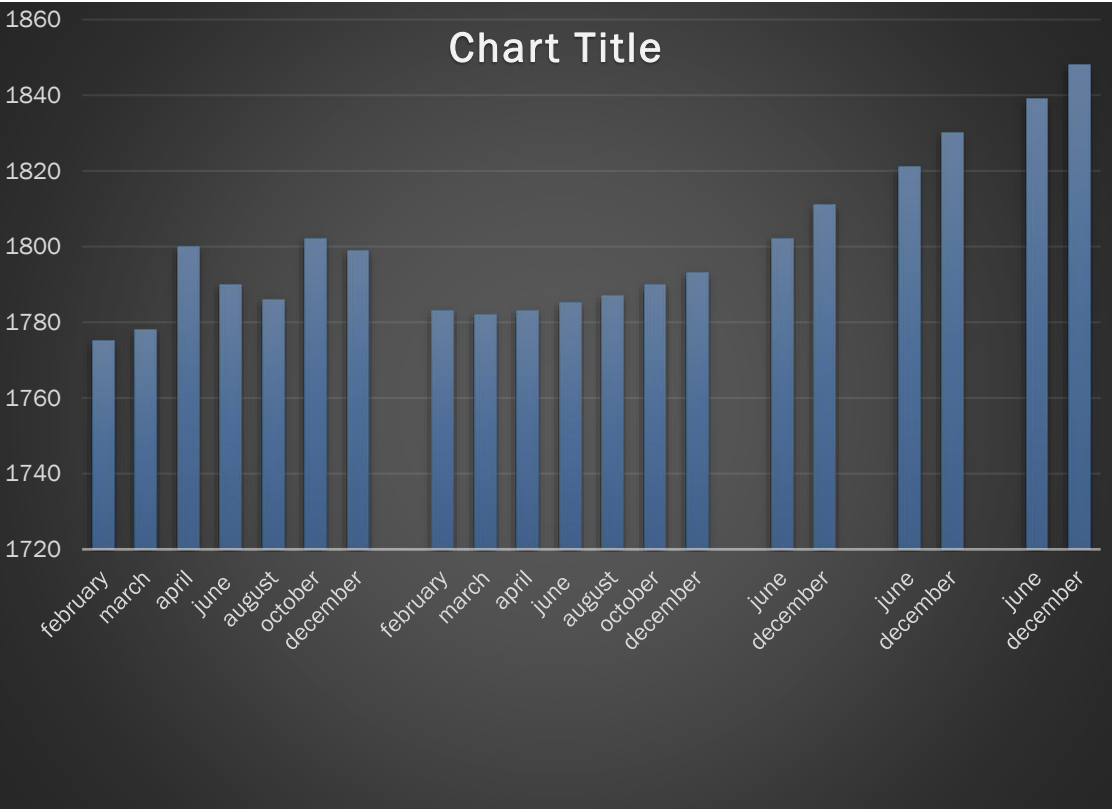
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KHADIJA



Quantitative forecasting uses the past trend of a particular variable in order to make a future forecast of the variable. In recognition of this method's reliance on time series, it is commonly called the "time series method." Time series data are useful when you are forecasting something that is changing over time. Anything that is observed sequentially over time is a time series. When forecasting time series data, the aim is to estimate how the sequence of observations will continue into the future.

There are various factors that may influence gold sector physical market factors as well as those related to trading and financial markets. We describe some key factors that could influence gold price sales and explore possible linkages between each factor.

Gold futures price by contract month 2021-2025

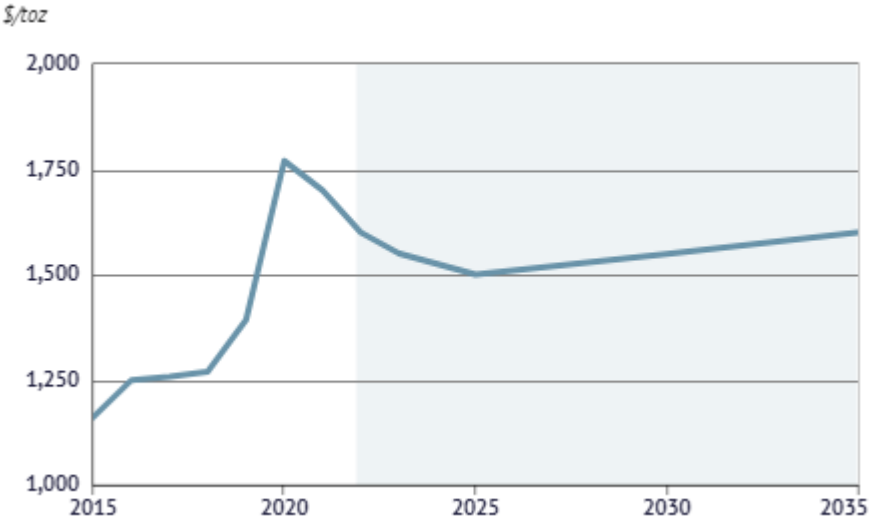


The gold market is composed of a physical gold market (commodity) in which gold bullions and coins are sold and bought and a paper gold market (currency or monetary asset), which entails trading in claims to physical stock instead of stock themselves. The “London OTC Market”, the “U.S. Futures Market” (COMEX) and the “Shanghai Gold Exchange” (SGE) are the three primary gold trading hubs. These markets account for over 90% of the trading volume in the world, accompanied by smaller secondary markets worldwide. These secondary markets include Dubai, India, Japan, Singapore, and Hong Kong. Notably, world gold prices are moving together nowadays, as there is no longer place for arbitrage. Figure 1 shows the monthly variations of gold price where two significant jumps in gold prices are observed. The first jump was in early January 1980, when gold prices reached \$630 per ounce and dropped dramatically in the same year due to high inflation, high oil prices, the intervention of Soviet Union in Afghanistan, and the impact of Iranian revolution which increases the demand for this precious metal. The second jump in gold prices started in 2021 following the worst financial crisis since the Great Depression and COVID. It continued to rise continuously as the highest price of gold in the second jump will be reached approximately \$1821 per ounce by the end of 2024. After that, it declined gradually and remained slightly fluctuating to the present.

Year	2021 Feb 17												
	February 2021	March 2021	April 2021	June 2021	August 2021	October 2021	December 2021	February 2022	April 2022	June 2022	August 2022	October 2022	December 2022
\$/toz	1,771.10	1,771.80	1,774.10	1,778.40	1,777.70	1,779.20	1,780.70	1,782.10	1,783.80	1,785.70	1,787.20	1,790.90	1,793.00

June 2023	December 2023	June 2024	December 2024	June 2025	December 2025
1,802.40	1,811.70	1,821.20	1,830.30	1,839.10	1,848.20

World Bank: Gold Price Forecast



During the last year,the gold price increased from \$1,479.13 to \$1,858.42 marking 25.6% growth year-over-year.In the first month of 2021,gold prices averaged \$1,866.98/oz,0.46 percent up from December.TWB predicts the price of gold to decrease to \$1,470/oz in 2021 form an average of \$1775/oz in 2020.In the next 10 years,the gold price is expected to decrease to \$1,400/oz by 2030

Markets are pricing in nearly four rate hikes for next year, with the first move coming as early as May. Last week the Federal Reserve signaled that it could raise interest rates three times.

Dahdah said that the path of U.S. monetary policy will depend on the speed of the economic recovery. He added that if the world can move on from the COVID-19 pandemic, then there is a high probability that the Federal Reserve will meet its target.

The biggest unknown factor heading into the new year is COVID-19 and the new highly transmissible Omicron variant, which is spreading around the world. Some countries are looking at establishing new lockdown measures.

"If Omicron because a huge problem and major lockdown measures are implemented, then gold prices could easily go back to \$2,000 an ounce," said Dahdah.

However, Dahdah said that the major linchpin in global economic growth will be China. He said that new lockdown

measures in China will further disrupt the global supply chain, increasing inflation pressures and limited growth.

"Even if the rest of the world is locked down, if China remains open, then the global economy could still see a continued recovery," he said.



How can each factor theoretically affect the gold price?

Factor Type	Factor	Impact on Gold Price
Fundamental	Jewellery Demand	Positive
Fundamental	Central Bank Demand	Positive
Fundamental	ETF Demand	Positive
Macro	Inflation Rate	Positive
Macro	Interest Rate	Negative
Macro	Money Supply	Positive
Macro	Dollar Strength	Negative

The impact of the fundamental factors is the easiest to understand. The more gold governments and people purchase, the less gold there are in the market and the price should climb up.

What Moves Gold Prices?

The price of gold is moved by a combination of supply, demand, and investor behavior. That seems simple enough, yet the way those factors work together is sometimes counterintuitive. For instance, many investors think of gold as an inflation hedge. Central banks have tried to manage their gold sales in a cartel-like fashion, to avoid disrupting the market too much. Something called the Washington Agreement essentially states that the banks won't sell more than 400 metric tons in a year. It's not binding, as it's not a treaty; rather, it's more of a gentleman's agreement—but one that is in the interests of central banks, since unloading too much gold on the market at once would negatively affect their portfolios.

Why Gold Price is Increasing?

1. Demand and Supply

As is true with any traded commodity, the demand and supply of gold, plays an important role in determining its price. Unlike oil, gold is not a consumable product. All the gold that has ever been mined is still available in the world. The amount of gold mined every year is not very high. If the demand for gold increases, the price increases since the supply is relatively scarce. Hence if you're wondering why gold price is rising, demand-supply conditions may be one of the reasons.

2. Inflation

When the inflation rates rise, the value of the currency decreases. Also, most other investment avenues fail to deliver inflation-beating returns. Hence, most people start investing in gold. Even if high rates of inflation last for an extended period, gold acts as a perfect hedge since it is not affected by fluctuations in the value of the currency.

3. Interest Rates

Gold prices have an inverse relationship with interest rates. When the interest rates fall, people don't get good returns on their deposits causing an increase in gold demand and so the price. On the other hand, when the interest rates rise, people sell their gold and invest in deposits to earn high interest leading to a drop in demand and price.

4. Indian Jewelry Market

In India, gold jewelry is integral to most religious festivals and weddings. That is why, during festivals and wedding seasons, the demand for gold increases, boosting its price. This is one of the reasons why gold rate increase in India.

5. Government Reserves

The Government of India holds gold reserves. Based on its policies, it can buy or sell gold through the Reserve Bank of India (RBI). The price of gold can get impacted depending on whether it buys or sells more. Therefore if you are wondering why the gold price is rising in India at any given point in time, government purchases and sales is also something you should look at.

6. Import Duty

India contributes less than one percent to global gold production. However, it is the second-largest consumer of precious metals. It imports a lot of gold to meet the high demand. Therefore, import duty plays an essential role in the price of gold.

7. Currency Fluctuations

In the international markets, gold is traded in USD. While importing USD is converted into INR. So, any fluctuations in the USD or INR can affect the import price of gold and hence the selling price.





Gold Price Today

Dec 27, 2021 23:02 NY Time

Bid

1,809.90

-2.00 (-0.11%) ▼

Ask

1,810.90

Gold Spot Price

Gold Price Today

Change

Gold price per ounce

1,809.90

-2.00

Gold price per gram

58.19

-0.06

Gold price per kilo

58,189.64

-64.30

Gold price in pennyweight

90.50

-0.10

Gold price in tola

678.71

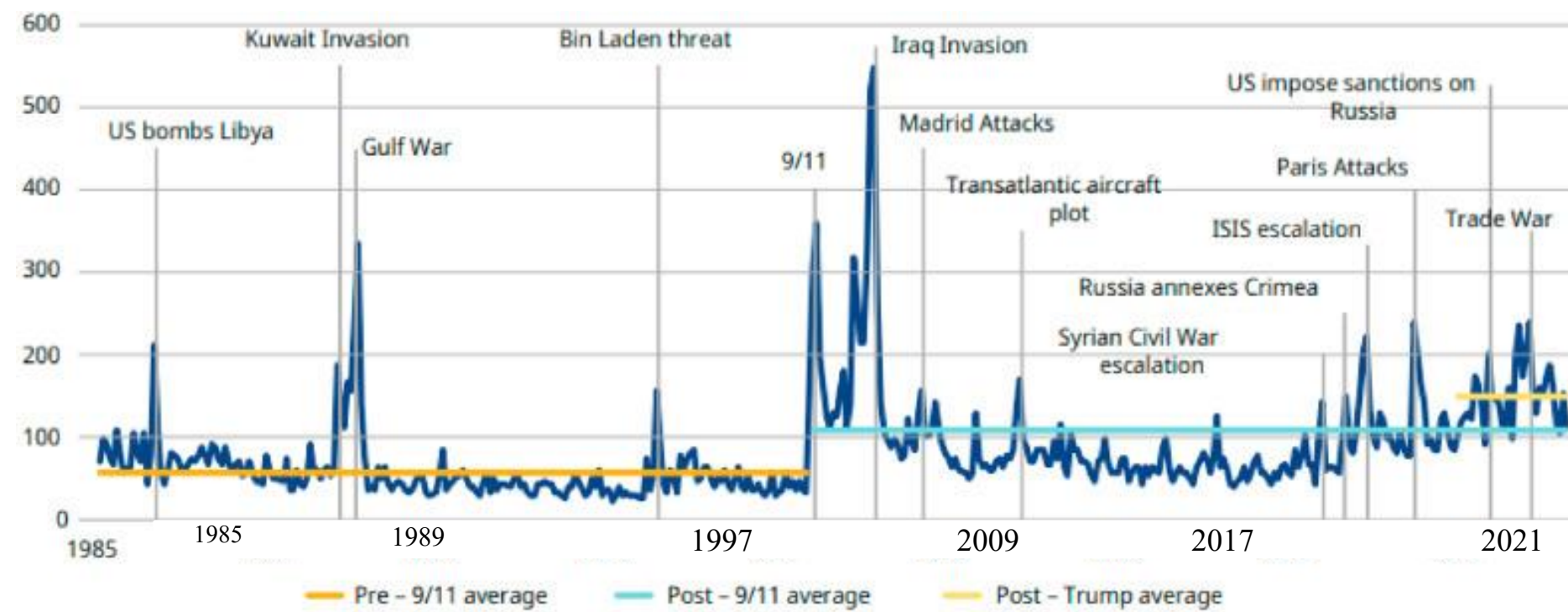
-0.75

Gold price in tael (HK)

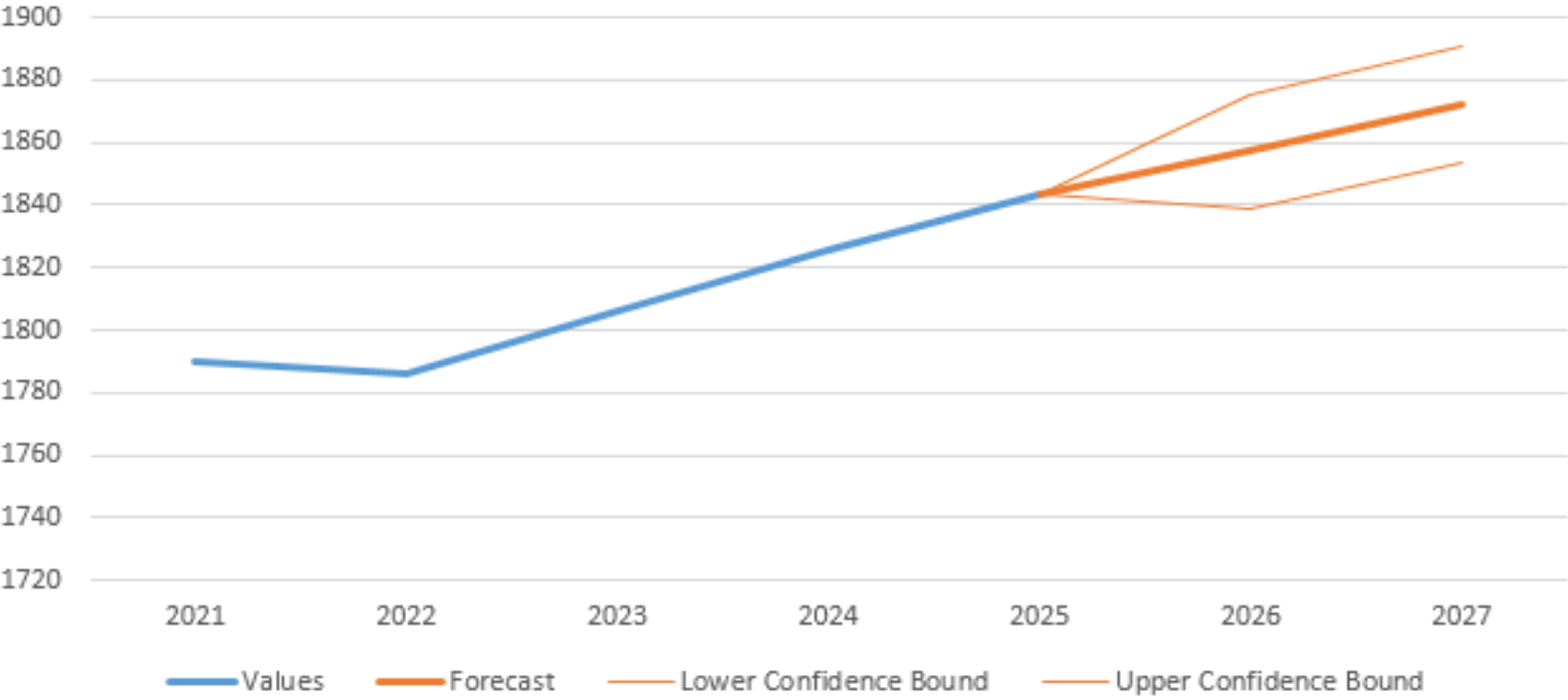
2,199.53

-2.43

Geopolitical And Economic Events In Gold Sector



A number of events are coming together which are set to push gold prices higher. Besides a combination of continuing inflationary policies and massive future budget deficits undermining the dollar, by closing down derivative market activities new Basel 3 regulations appear set to deflect some demand into physical metals. Furthermore, liquidity in gold markets will contract, potentially making prices more volatile.



Gold Price Forecast 2025-2030

Though it is hard to say for sure for such a long period of time, experts from different resources concur that gold will continue rising. However, they have opposite opinions about the speed of this growth. Most price forecasts aren't worth more than an umbrella in a hurricane. There are so many factors, so many ever-changing variables, that even the experts usually miss the mark. So while we take predictions with a grain of salt, let's look at what might be ahead for gold price in 2021 and the next 5 years. We'll first summarize what many analysts are predicting, and then look at the factors that are likely to have the biggest impact on gold. I'll conclude with the probable prices I see based on those factors, as well as some long-term projections.

Timeline	Values	Forecast	Lower Confidence Bound	Upper Confidence Bound
2021	1790			
2022	1786.143			
2023	1806.5			
2024	1825.5			
2025	1843.5	1843.5	1843.50	1843.50
2026		1857.3632	1839.11	1875.62
2027		1872.2466	1853.42	1891.07

$$F_t = \alpha A_{t-1} + (1-\alpha) F_{t-1}$$

F_t Actual demand

α Smoothing constant

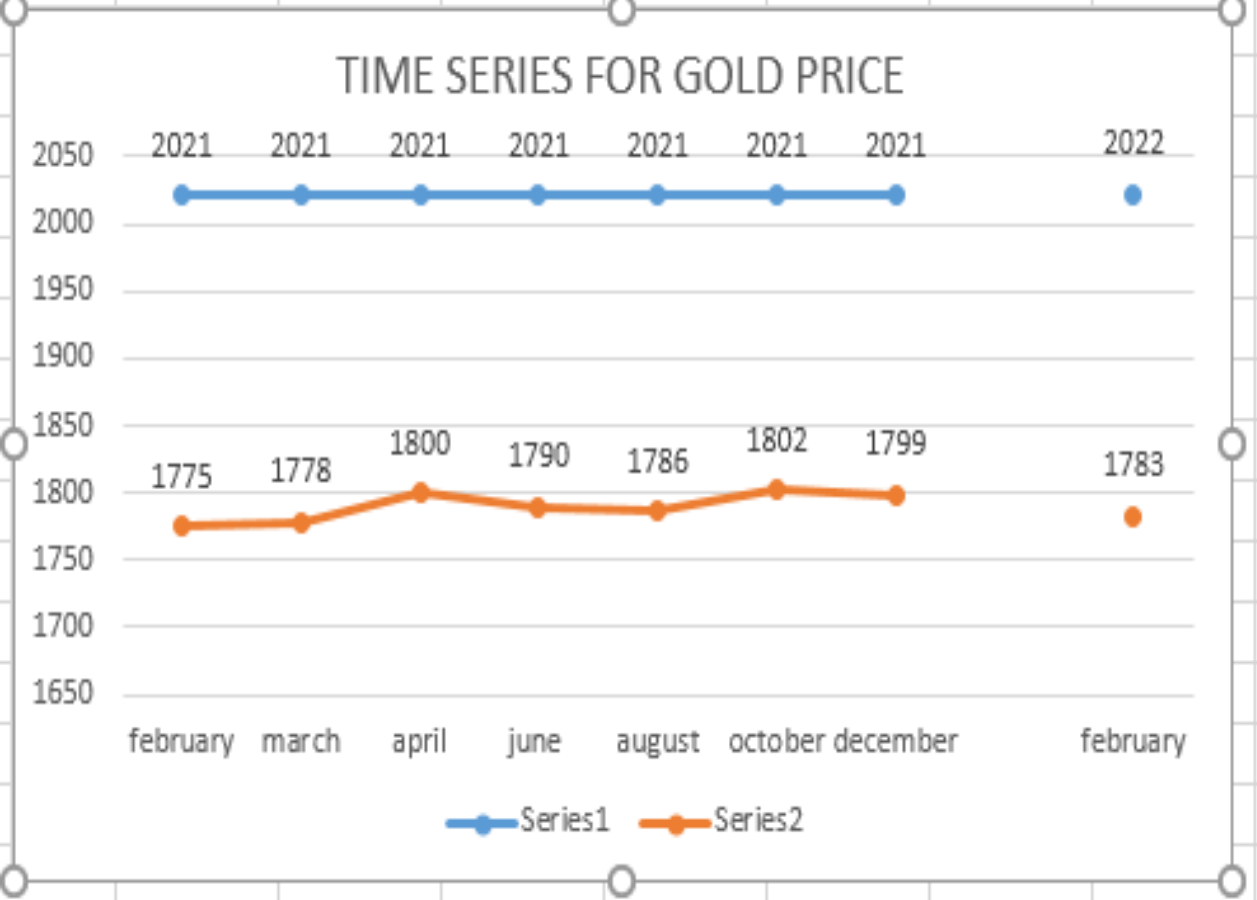
A_{t-1} Previous period's actual demand

F_{t-1} Previous period's forecast demand

Exponential smoothing weights past observations with exponentially decreasing weights to forecast future values. In other words, the new forecast is the old one plus an adjustment for the error that occurred in the last forecast.

This method is suitable for forecasting data with no trend or seasonal pattern, data with only random variation, short term forecasting.

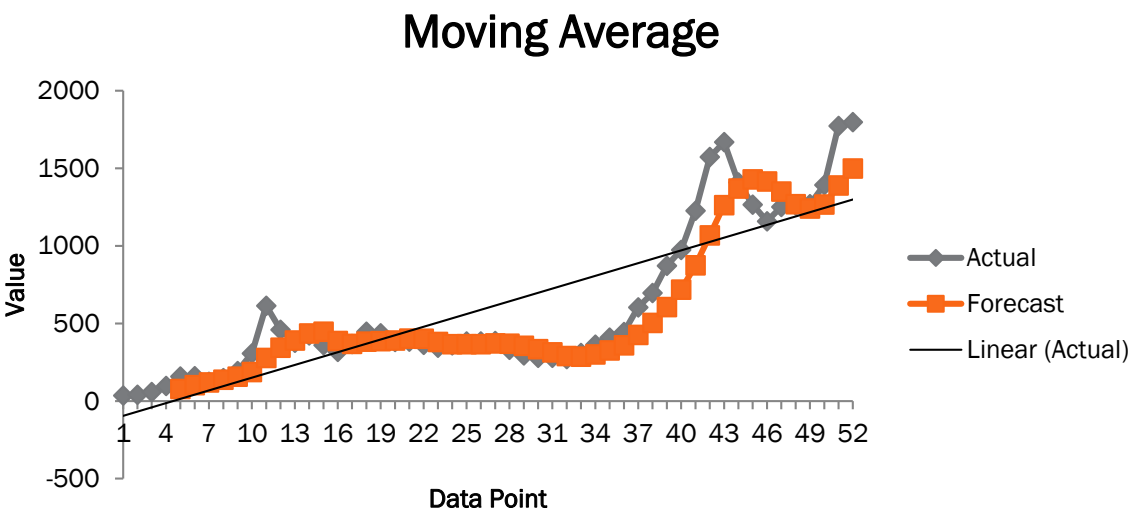
In other words, the new forecast is the old one plus an adjustment for the error that occurred in the last forecast.



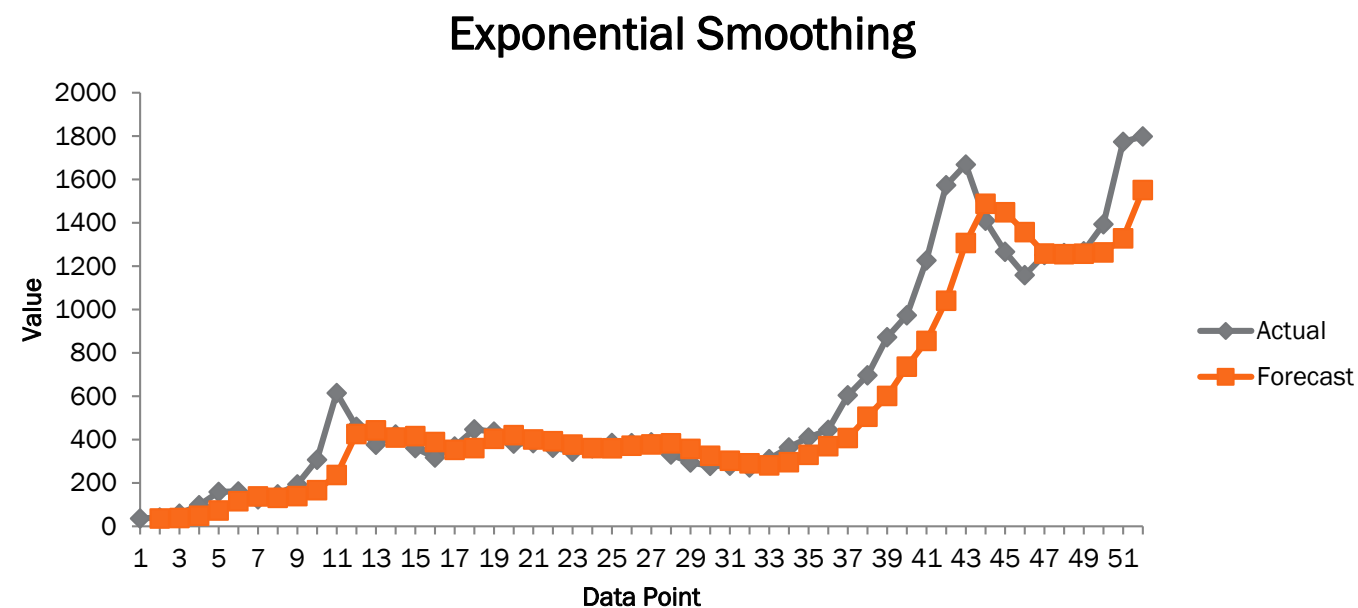
B8

	A	B	C	D	E	F	G
1							
2	period	sales					
3	2017	1257					
4	2018	1269					
5	2019	1392					
6	2020	1770					
7	2021	1700					
8	2022	1893.7					
9	2023	2032.4					
10	2024	2201.393					
11	2025	2334.369					
12							
13							

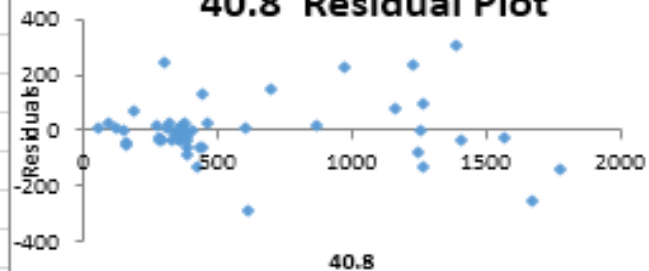
Year	Average Closing Pri	Exponential Smoothing	Standart dv
1969	41,1		
1970	35,96		
1971	40,8		
1972	58,17	#N/A	#N/A
1973	97,12	35,96	#N/A
1974	158,76	38,38	#N/A
1975	160,87	48,275	#N/A
1976	124,8	72,6975	30,55543446
1977	147,84	115,72875	58,26443178
1978	193,57	138,299375	62,79681622
1979	307,01	131,5496875	56,64721083
1980	614,75	139,6948438	28,78274864
1981	459,16	166,6324219	33,41726035
1982	376,11	236,8212109	87,31890056
1983	423,71	425,7856055	234,8322568
1984	360,65	442,4728027	233,5593317
1985	317,42	409,2914014	222,3720916
1986	368,2	416,5007007	43,68740392
1987	446,84	388,5753503	50,76487743
1988	436,78	352,9976752	52,88440424
1989	381,27	360,5988376	52,95751545
1990	383,73	403,7194188	65,14530594
1991	362,34	420,2497094	54,04211569
1992	343,87	400,7598547	57,8790632
1993	360,05	392,2449273	31,10431763
1994	384,16	377,2924637	30,02076157
1995	384,07	360,5812318	27,69706187
1996	387,73	360,3156159	25,89496711
1997	331	372,237808	23,70582163
1998	294,12	378,153904	15,3713763
1999	278,86	382,941952	16,33255477
2000	279,29	356,970976	31,24990005
2001	271,19	325,545488	47,39871016
2002	310,08	302,202744	54,24557232
2003	363,83	290,746372	47,09838571
2004	409,53	280,968186	32,07792758
2005	444,99	295,524093	24,1863821
2006	604,34	329,6770465	44,33075054
2007	696,43	369,6035232	62,95418659
2008	872,37	407,2967616	74,66661903
2009	973,66	505,8183808	130,237799
2010	1226,66	601,1241904	164,1563767
2011	1573,16	736,7470952	222,6605162
2012	1668,86	855,2035476	235,2550411
2013	1409,51	1040,931774	298,709396
2014	1266,06	1307,045887	398,9045438
2015	1158,86	1487,952943	429,0129109
2016	1251,92	1448,731472	374,3125399
2017	1260,39	1357,395736	238,3496132
2018	1268,93	1258,127868	162,2124126
2019	1393,34	1255,023934	155,8031264
2020	1773,73	1257,706967	114,7225213
2021	1798,54	1263,318483	8,026804242
		1328,329242	75,41075496
		1551,029621	267,9635465
2022		1674,78481	303,6164345



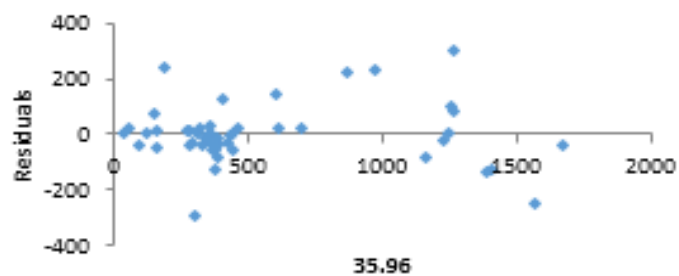
2022 1674,785 303,6164



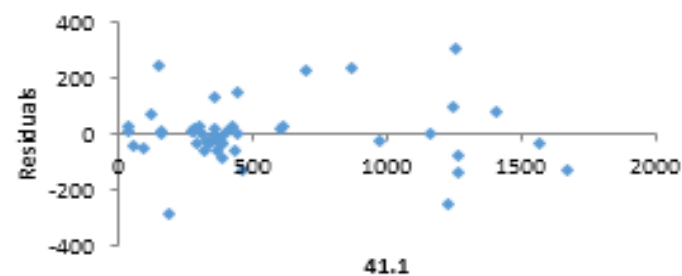
40.8 Residual Plot



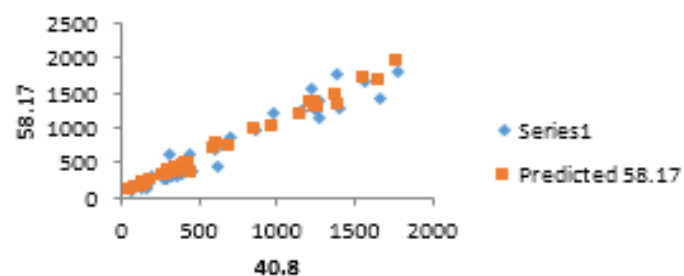
35.96 Residual Plot



41.1 Residual Plot

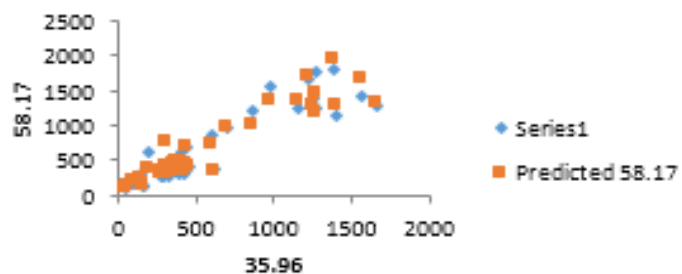


40.8 Line Fit Plot

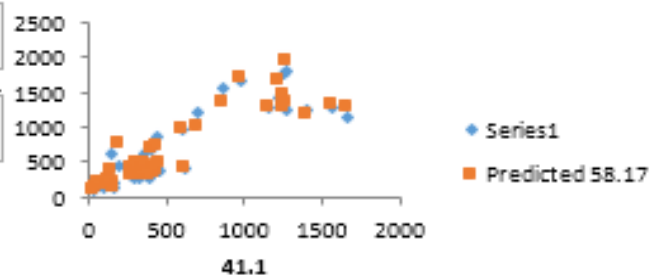


$$y = 27,1 + 1,4(y-1) - 0,6(y-2) + 0,2(y-3)$$

35.96 Line Fit Plot



41.1 Line Fit Plot



THANKS!

