Cryptocurrency Poses No Threat to Gold's Investment Case

Safe-haven dollars are unlikely to flow into cryptocurrency.

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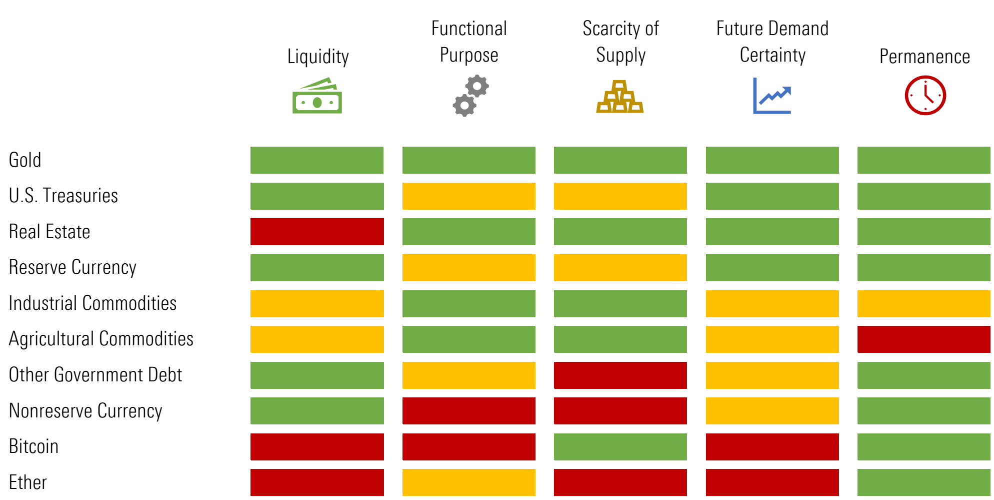
With their meteoric price rises in 2017, cryptocurrencies garnered the attention of even the most unsophisticated investors, and applications beyond the blockchain were explored. Amid the growing hype, some even floated the idea that cryptocurrency could one day replace gold as one of the world's most widely accepted investment assets. After all, the prospect of replacing physical mining that requires heavy machinery, deep tunnels, and chemical pools with computers running code is enticing.

If cryptocurrency were to displace gold's investment case, the implications for gold prices would be devastating: 40% of gold demand relates to investment, so a shift in investment from gold to cryptocurrency would be a seismic shock. Not only would nearly half of existing gold demand evaporate, but all inventory already held for investment would probably re-enter the market as supply, further crippling prices.

In this report, we provide a framework to grade the viability of various asset classes as safe havens. Through this framework, we conclude that cryptocurrency does not and will not challenge gold as a safe-haven asset class. Accordingly, we see some value across our gold coverage, with Goldcorp standing out as a unique long opportunity.

Exhibit 1 Our Framework Rates Gold as a Much Better Safe-Haven Investment Than Cryptocurrency



Source: Morningstar
Note: Green indicates overall strength, yellow indicates roughly balanced strengths and weaknesses, and red indicates overall weakness.

Key Takeaways

- Nearly 40% of annual gold demand would be at risk if cryptocurrency gained the same acceptance as gold for investment. However, we think this threat is unlikely to materialize.
- We've created a framework for assessing the safe-haven viability of an asset class on five key factors: liquidity, functional purpose, scarcity of supply, future demand certainty, and permanence. On the basis of these factors, we confirm gold's strength as a safe-haven asset while cryptocurrencies pale in comparison.
- Although our framework confirms gold's ongoing viability as a safe-haven asset, the investment case has continued to weaken amid rising real interest rates. However, we see upside for gold prices, given our bullish long-term outlook for jewelry demand in China and India.
- Goldcorp remains undervalued, in our view, as its current price reflects skepticism about the company's current 20/20/20 growth plan.

Companies Mentioned

Name/Ticker	Currency	Fair Value Estimate	Current Price	Morningstar Rating	Uncertainty Rating	2018E Production (Thousands of Ounces)	2018E Cash Cost ($ per Ounce)	Market Cap (Bil.)
Agnico Eagle AEM	USD	45.00	38.63	★★★	High	1,580	658	9.1
AngloGold Ashanti AU	USD	10.00	8.31	★★★	Very High	3,295	798	3.4
Barrick Gold ABX	USD	13.50	10.50	★★★	Very High	4,635	639	12.2
Buenaventura Mining BVN	USD	12.00	13.17	★★★	Very High	657	803	3.3
Eldorado Gold EGO	USD	2.00	0.97	★★★	Extreme	300	686	0.7
Goldcorp GG	USD	16.50	11.52	★★★★	Very High	2,195	488	10.0
Iamgold IAG	USD	6.50	4.74	★★★★	Very High	879	776	2.2
Kinross Gold KGC	USD	4.00	3.11	★★★	Very High	2,417	714	3.9
Newmont Mining NEM	USD	36.00	34.65	★★★	Very High	5,110	723	18.5
Yamana Gold AUY	USD	3.00	2.87	★★★	Very High	1,096	741	2.7

Can Cryptocurrencies Replace Gold?

Amid their meteoric price rises of 2017, bitcoin and other cryptocurrencies garnered mainstream attention and legitimacy as an asset class. Some went so far as to posit the idea that cryptocurrencies could replace traditional forms of currency or assets, including gold.

Exhibit 2 Bitcoin Gained More Than 1,800% in Value in 2017, Drawing Attention From a Wider Audience
Price per bitcoin

Source: CoinDesk

In this report, we assess the potential for cryptocurrencies to replace gold as an investment asset. First, we provide a framework to assess various assets for their viability as safe-haven investments—one of the major reasons investors buy gold. Second, we assess various asset classes that can reasonably be considered safe havens using this framework, with a particular focus on cryptocurrency and gold. Third, we look at our gold miner universe to find undervalued names for which we see some attractive investment opportunities. Lastly, we discuss the uses for gold and assess the staying power of its demand.

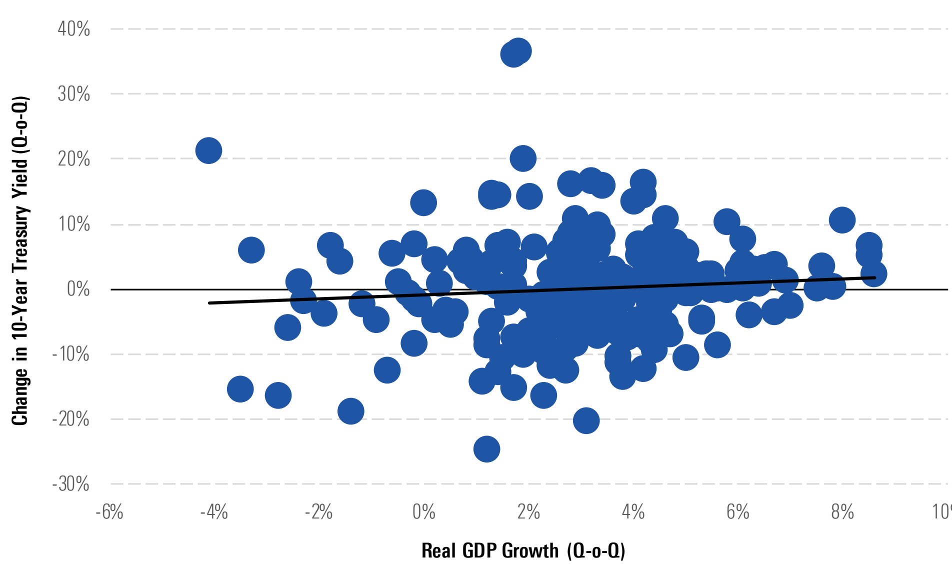
Cryptocurrency Won't Emerge as a Safe-Haven Asset Class

Defining Safe-Haven Assets

As a first step in determining whether cryptocurrencies should be considered safe-haven assets, we need to define what safe-haven assets are. For our purposes, we classify an asset as a safe haven if it holds, or even increases, its value during periods of market and economic uncertainty and downturns. The asset should preserve capital, withstand market volatility, and provide diversification across a portfolio.

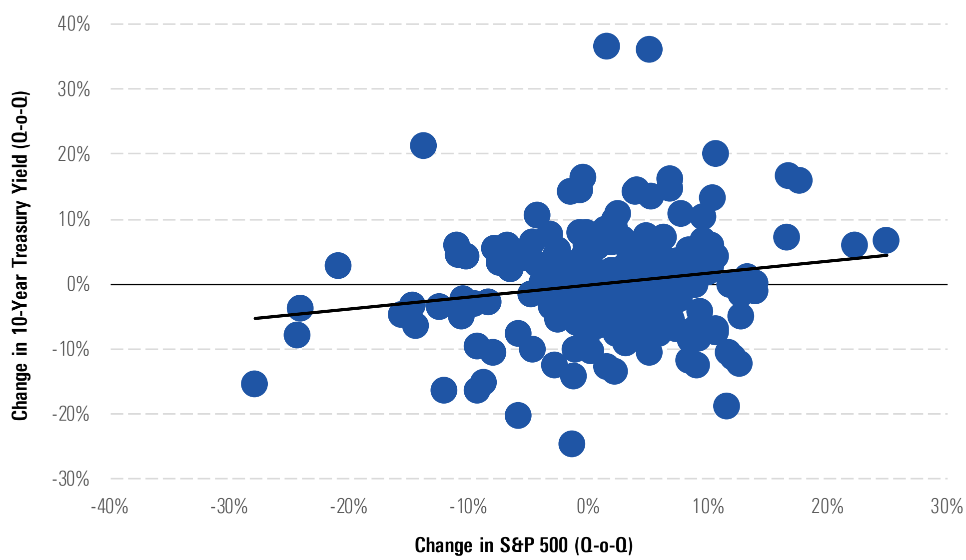
Many asset classes have traditionally been considered safe havens. This list includes gold and other precious metals, industrial commodities, agricultural commodities, currencies, real estate, consistent dividend stocks (utilities and real estate investment trusts), and U.S. Treasuries. For example, the notion that the U.S. government will always pay its debt back establishes U.S. Treasuries as virtually risk-free, leading to little correlation with economic and market price movements, as shown in exhibits 3 and 4.

Exhibit 3 U.S. Treasuries' Safe Haven Status Leads to Little Correlation With Economic Growth…



Source: FRED

Exhibit 4 …or Broad Equity Market Movements

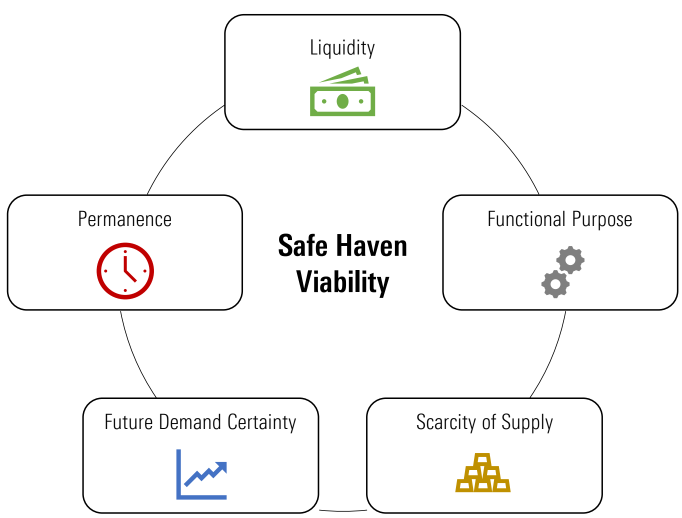


Source: FRED

Safe-Haven Framework Allows Us to Compare Different Investment Assets

Based on our established definition, we've created the following framework for assessing the viability of any asset class as a safe-haven.

Exhibit 5 Our Safe-Haven Framework Focuses on Five Qualities of an Investment Asset



Source: Morningstar

Liquidity

How easily can investors buy and sell the asset? Investors should be able to convert the asset into cash easily at any time, requiring an active market that allows easy liquidation.

Examples: Currency is the most obvious liquid asset, as it can be used immediately. In comparison, real estate transactions can take months. Immediate liquidation of real estate can be challenging in certain scenarios.

Functional Purpose

Does the asset have any purpose other than as an arbitrary store of value? Additional uses create an anchor of demand for the asset, helping provide long-term demand stability. If there is no usefulness for the asset, then there's essentially no floor for demand, and the asset could easily be worth zero if sentiment on its investment viability changed rapidly.

Examples: Real estate allows the owner to develop assets on the land, and commodities can be processed into higher-value goods. Nonreserve currencies hold comparably weaker functional purpose, especially if only accepted in the issuing country.

Scarcity of Supply

Is there significant scarcity of the asset that limits potential supply growth in the market? Investors need some certainty that supply growth won't outpace demand growth. Otherwise, the asset value will probably erode even if demand is growing, likely leading to long-term price deflation.

Examples: Real estate and commodities hold some of the most obvious scarcity, as there is only a limited quantity of either asset. In comparison, cash and government bonds have weak scarcity, as there are virtually no limits to how much can be printed.

Future Demand Certainty

Is there going to be demand for the asset in the future? Furthermore, if the asset has use now, is it possible that it can be replaced or disrupted in the future? Investors need to believe that there will be a future market for the asset. Without this confidence in a future market, then the asset can't store value.

Examples: There is almost no question that there will be demand for real estate in the future, especially when compared with certain commodities that may be disrupted or replaced. For example, coal's demand has fallen dramatically as alternative energy sources have gained adoption.

Permanence

Does the asset's utility deteriorate over time? Will the asset be just as useful years from now as it is today? Investors need some certainty that the asset won't decay over time, which would otherwise erode its value.

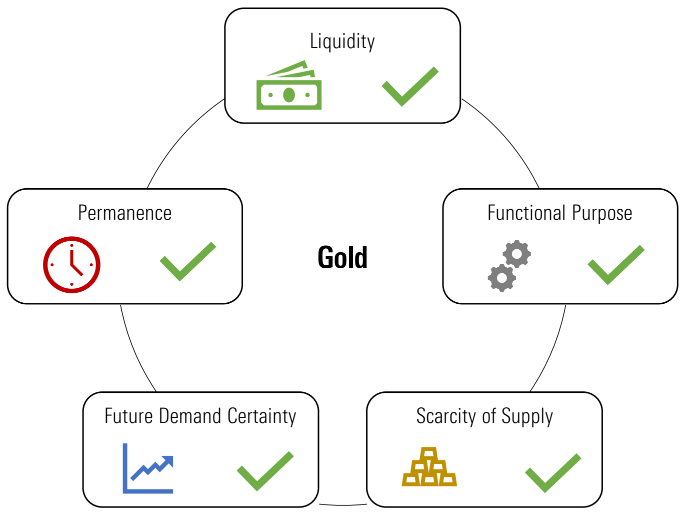
Examples: Real estate and gold are virtually permanent, with no significant erosion of quality over time. In comparison, agricultural commodities' permanence is questionable, as most will rot in time.

Using Our Framework to Assess Safe-Haven Assets

Putting Gold Through Our Framework Confirms Its Pre-Eminent Safe-Haven Value

Now that we've created our safe-haven framework, we use it to assess gold in Exhibit 6. Our analysis confirms gold's viability as a safe-haven asset across all five categories.

Exhibit 6 Safe-Haven Framework Confirms Gold's Investment Value



Source: Morningstar

Liquidity

Yes. The market for gold is highly liquid, both for physical and investment assets. Furthermore, with global acceptance of its value, its liquidity transcends national boundaries.

Functional Purpose

Yes. Jewelry is gold's single-largest demand category, accounting for more than half of global demand. An additional 10% of demand stems from industrial uses. This provides gold with a clear functional purpose.

Scarcity of Supply

Yes. As a mined commodity, there are only so many gold deposits around the world. Over time, "new" gold becomes increasingly difficult and costly to mine, all else equal. Although gold can be recycled, rising prices are typically needed to encourage holders to sell.

Future Demand Certainty

Yes. It's often difficult to foresee a seismic change in future demand before it happens. However, based on its long history of use in jewelry, especially given its longstanding cultural significance, which forms the basis of its perceived value, gold has a comparably solid certainty for future demand.

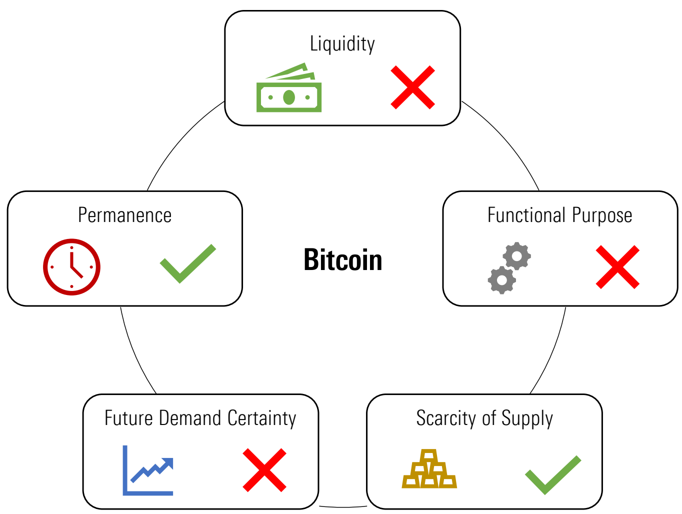
Permanence

Yes. Gold does not decay, rust, or expire, and it requires minimal maintenance. Value is unlikely to erode due to weakening quality of any piece of gold.

Assessing Bitcoin Through Our Framework Reveals Weaknesses Around Its Safe-Haven Viability

Now that we've used our framework to confirm gold's safe-haven viability, we now use it to look at the most popular cryptocurrency, bitcoin, in Exhibit 7. Our analysis reveals that bitcoin faces some clear challenges on this front. Weaker liquidity and uncertainty surrounding functional purpose as well as highly uncertain future demand prevent bitcoin from serving as an effective safe-haven currency at this time.

Exhibit 7 Safe-Haven Framework Reveals Bitcoin's Weaknesses



Source: Morningstar

Liquidity

No. Market volume appears to be high enough to offer some liquidity. However, current levels of trading see daily volume of roughly 0.5% of all existing bitcoins. Gold averages more than 5 times as much volume, with nearly 3% of all existing gold being regularly traded.

Functional Purpose

No. Blockchain has great potential across a variety of use cases, and bitcoin is currently the most popular cryptocurrency. However, the actual usage of bitcoin for transactions is still quite limited and its future uncertain. This is partially because average transaction times still take more than eight minutes to be completed. In comparison, gold has a multitude of noninvestment uses.

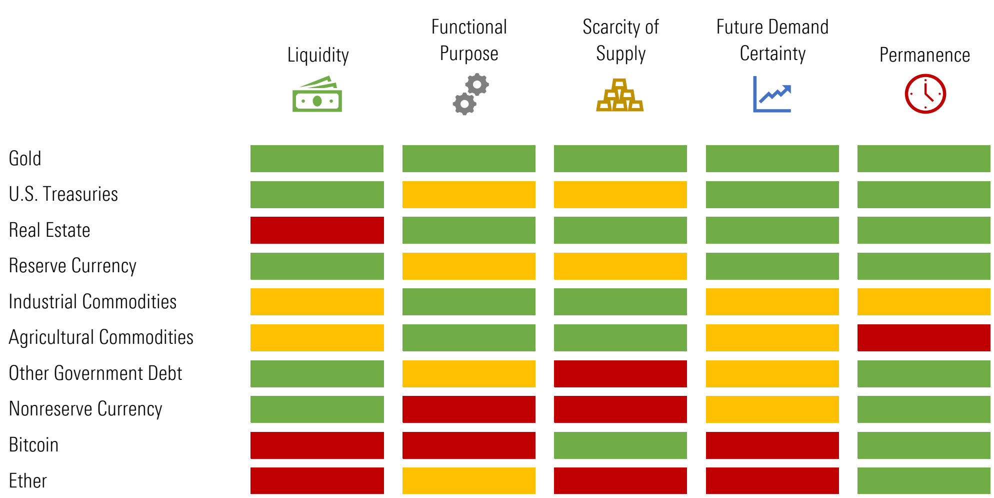
Scarcity of Supply
Yes. Although there's limited unmined gold reserves, higher prices can justify the opening of new production and the mining of higher-cost, lower-grade deposits. In comparison, there's a definitive total number of bitcoins that can ever be created, thus establishing scarcity of supply that's more powerful than gold's.

Future Demand Certainty
No. Bitcoin's future demand is highly dependent on the success of blockchain adoption and, more specifically, the adoption of blockchains that utilize bitcoin as their cryptocurrency. Although the potential of blockchain in general is considered quite high, there remains uncertainty around which blockchain and which cryptocurrency will be the most popular.

Permanence
Yes. Existing as lines of code, bitcoins do not face any decay or deterioration that would erode their value, all else equal.

Cryptocurrency Unlikely to Attract Gold's Investment-Related Dollars in the Foreseeable Future
Based on our analysis, we think it's unlikely that cryptocurrency will meaningfully attract safe-haven investment dollars away from gold. As shown in Exhibit 8, many other investment assets, in addition to gold, score higher in our framework. For cryptocurrency to challenge gold's investment case, we think additional certainty surrounding blockchain's use, additional certainty around the popularity of one cryptocurrency over another, and improved trading volume will be needed.

Exhibit 8 Our Framework Uncovers Several Other Assets as Better Safe-Haven Investments



Source: Morningstar
Note: Green indicates overall strength, yellow indicates roughly balanced strengths and weaknesses, and red indicates overall weakness.

Other Assets Also Face Limitations, but Still Provide Better Safe Havens Than Cryptocurrency

U.S. Treasuries

Highly liquid trading markets, near certainty of future demand, and strong permanence help U.S. Treasuries serve as great safe-haven assets. However, we believe U.S. Treasuries face some weaknesses as a pure investment asset and no theoretical limitations to hold back supply.

Real Estate

Real estate's highly functional purpose, scarce supply, almost certain future demand, and permanence cement its ability to hold value. However, the uniqueness of each asset results in transactions that can take months, hurting potential liquidity.

Reserve Currency

Reserve currencies are distinguished as being held by outside governments as part of foreign exchange reserves, fostering cross-border trade and investment. As cash, reserve currency is highly liquid and does not physically decay over time. However, it does not have physical function beyond cash and faces the risk of its government excessively adding to the supply and competition from other reserve currencies.

Industrial Commodities

Industrial commodities such as copper or iron ore have been used to store value at times. As limited mine resources with multiple industrial purposes, industrial commodities have strong foundations of limited supply and high usefulness to serve as a safe-haven asset. However, each industrial commodity faces some combination of small spot markets that potentially hurt liquidity, the potential for disruption by new technologies or replacement by other materials, and some value loss over time (for example, rusting).

Agricultural Commodities

Agricultural commodities enjoy similar strengths (limited supply and high usefulness) and weaknesses (potential liquidity challenges and disruption) as industrial commodities. However, their permanence is even weaker, as most agricultural commodities will decay over time, limiting the period they can hold value.

Other Government Debt

Similar to the additional challenges that nonreserve currency faces relative to reserve currency, other government debt faces challenges when compared with U.S. debt. Without the credit quality of the United States backing them, other government debt faces higher risks of overissuance and potential loss of value. While it's a potentially attractive investment, the lack of stability hurts its viability as a safe-haven asset.

Nonreserve Currency

Nonreserve currencies tend to be a poor choice to store value. Without the stability that comes from use as foreign exchange reserves, they have comparably less functional purpose than reserve currencies. Furthermore, nonreserve currencies arguably have a higher risk of excessive additions to supply.

Ether

Ether, the second-most popular cryptocurrency by market capitalization after bitcoin, faces similar challenges as bitcoin. Nascent adoption of Ethereum, the related blockchain, weighs on its safe-haven viability. However, ether faces an additional challenge in that its supply is not currently limited, as is the case for bitcoin. New ether can be created by mining (total supply grew 10% in 2017), which can potentially introduce a deflationary headwind to the cryptocurrency's price. On the positive side, ether has comparatively better functionality than bitcoin. Ethereum is specifically designed to be a platform for smart contracts and to allow third-party applications to utilize its blockchain. This purpose potentially has more wide-ranging applications than the more specifically designed bitcoin.

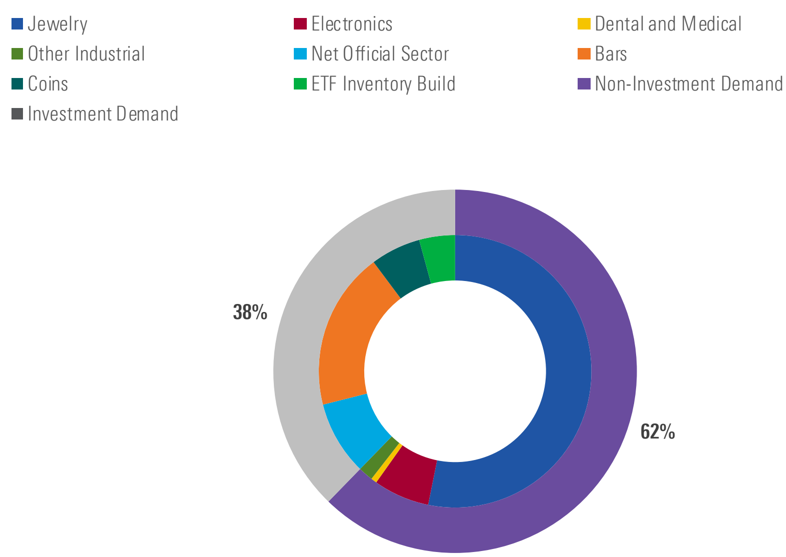
Having determined that cryptocurrency is unlikely to emerge as a threat to gold's investment case, we now take a look at overall gold demand to further illustrate why we are optimistic about future demand.

Gold's Functional Purpose Will Prove Sustainable in the Long Run

Gold Demand Primarily Composed of Jewelry and Investments

Gold has many uses, including jewelry, electronics, and investment, the key reason it checks out as a positive for functional purpose in our safe-haven framework. As shown in Exhibit 9, nearly 40% of gold demand is related to investment purposes, including bars and coins, central bank purchases, and exchange-traded funds. Theoretically, this portion of demand could be under threat to be displaced by cryptocurrency.

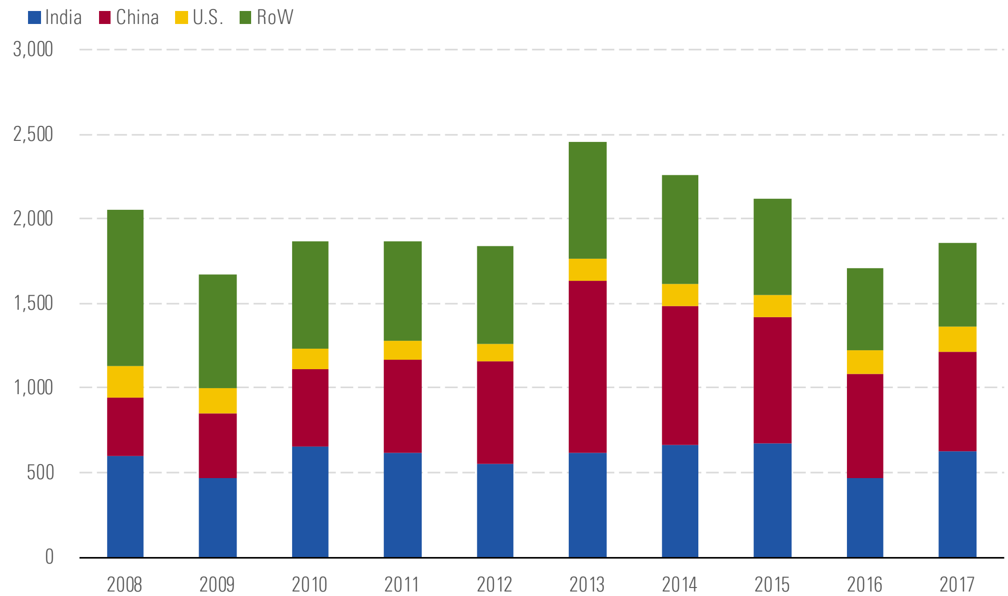
Exhibit 9 Nearly 40% of Gold Demand Could Theoretically Be Under Threat by Cryptocurrency
2017 gold demand



Source: Thomson Reuters GFMS

Accounting for more than 50%, jewelry is the single-largest individual source of demand, shown in Exhibit 10 by country. After a 21% drop in demand in 2016 amid challenges in its two largest markets, China and India, 2017 demand stabilized in China while India returned to growth. This helped global jewelry demand recover 13% to 2,214 tonnes in 2017. Nevertheless, this remains about 400 tonnes below the average from 2013 to 2015. Our long-term thesis is unchanged, as we believe rising incomes in the two countries will lead to growing jewelry demand. As it is anchored by a religious and cultural significance not seen in Western countries, we see little reason to believe that Chinese and Indian interest in gold will wane anytime soon.

Exhibit 10 Demand in China and India Recovered in 2017 but Remains Below Historical Levels
2017 gold demand in tonnes



Source: Thomson Reuters GFMS

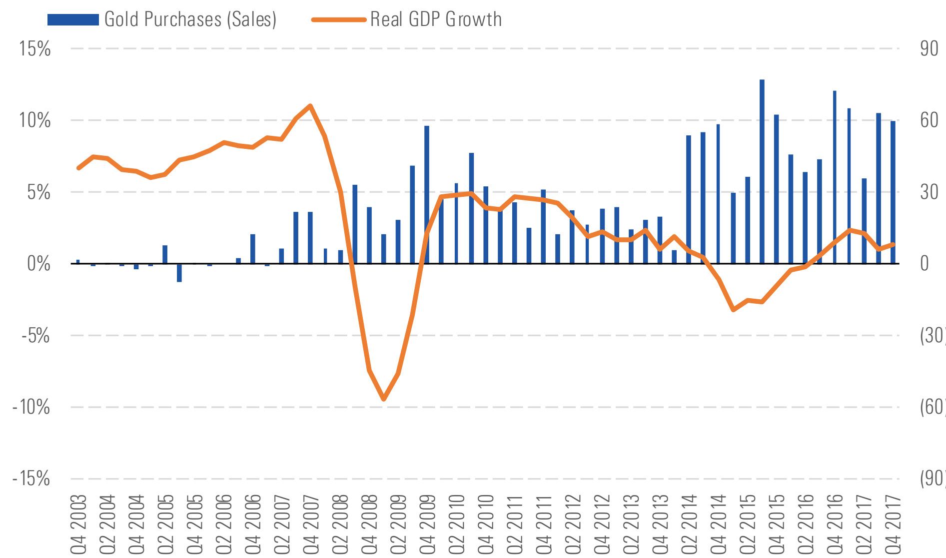
Other noninvestment purposes for gold include electronics, dentistry, and other industrial uses. Gold has many attractive properties for use in these end markets. However, its high cost can encourage switching to alternative materials. We anticipate a slow secular decline to continue as cheaper alternatives steal share from gold.

Justifying Gold as an Investment Asset

Although individuals buying bars, coins, and ETFs constitute the majority of gold investing, central bank purchases accounted for nearly 10% of total gold demand in 2017. As explained by Carl-Ludwig Thiele, member of the executive board of Germany's Bundesbank[1], "The availability of reserve assets like gold strengthens public confidence in the stability of a central bank's balance sheet." In other words, holdings in gold and other currencies can build confidence in fiat currency that otherwise has no backing. This may be particularly helpful for currencies that are facing concerns about the issuing government's economy. For example, as shown in Exhibit 11, Russia has been a significant gold buyer for its central bank in the past several years as its economy slowed.

[1] World Gold Council: Gold Investor, December 2017.

Exhibit 11 Russia's Central Bank Accelerated Its Gold Purchases as Economy Slowed
Gold purchases in tonnes (right) and real GDP growth (left)



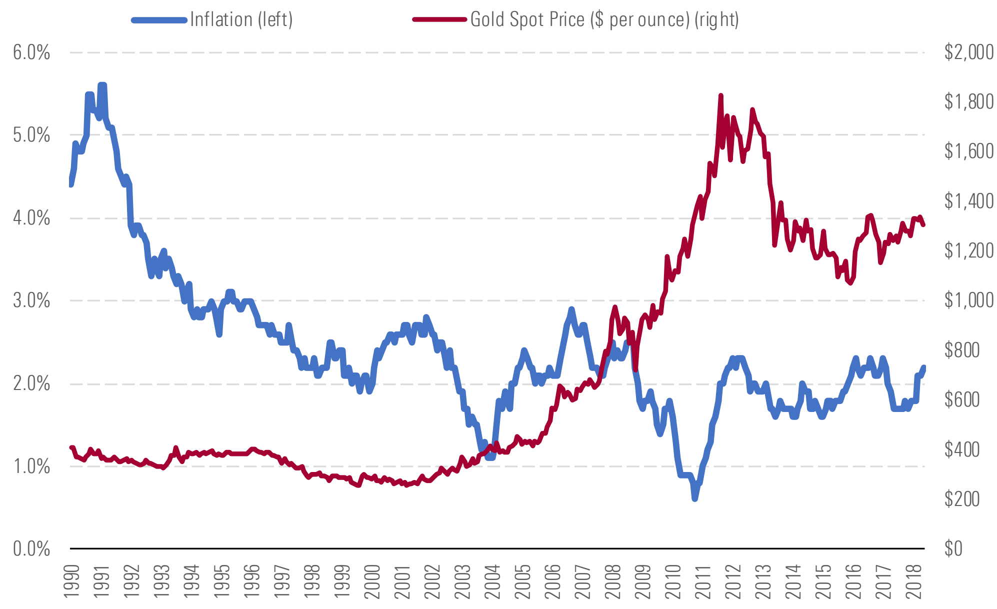
Source: World Gold Council and OECD

The public confidence gold lends to central bank balance sheets reflects the same reasons individuals invest in gold. We've classified individual gold investment into three major reasons, centered on its use as a store of value: inflation hedge, U.S. dollar hedge, and safe haven.

Gold as an Inflation Hedge

To assess gold's ability to hedge against inflation, we've looked at how gold prices have trended against inflation in Exhibit 12. At first glance, it may appear that gold is a mediocre hedge to inflation, as gold prices looked largely unmoved before the financial crisis in 2008.

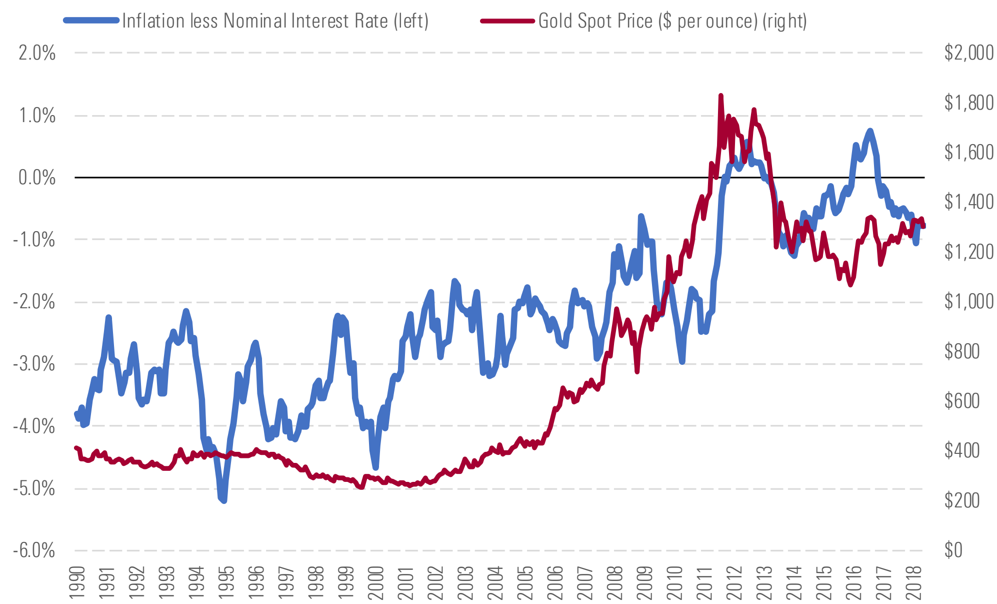
Exhibit 12 At First Glance, Gold Appears to Be a Weak Hedge Against Inflation…
1990-2018 gold spot prices and inflation (consumer price index less food and energy)



Source: Bureau of Labor Statistics and FRED

Looking solely at inflation ignores the opportunity cost of holding gold. When compared with another safe-haven asset like U.S. Treasuries, gold yields no return whereas a government bond will pay interest. In Exhibit 13, we now look at inflation less the U.S. 10-year Treasury yield against gold prices and see a stronger relationship. When inflation minus the opportunity cost approached and even surpassed zero, gold prices rose sharply. This validates gold as a decent hedge to inflation, as long as opportunity costs are taken into account.

Exhibit 13 …but Gold Prices Correlate Strongly Against Inflation Less the Risk-Free Rate
1990-2018 gold spot prices and inflation (consumer price index less food and energy) less risk-free rate (U.S. 10-year Treasury yield)

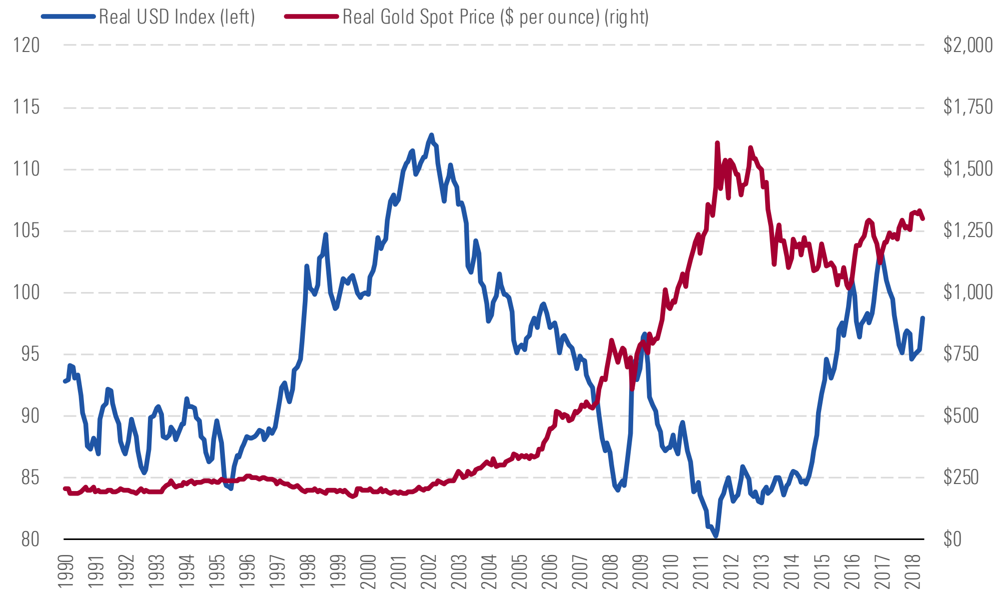


Source: Bureau of Labor Statistics and FRED

Gold as a U.S. Dollar Hedge

To assess gold's ability to hedge against the U.S. dollar, we've looked at how gold prices have trended against the real trade-weighted U.S. dollar index in Exhibit 14. During the massive drop in the value of the U.S. dollar from 2002 to 2011, real gold prices rose more than 600% from $250 per ounce to $1,500 per ounce. Similarly, a rise in the value of the U.S. dollar after 2011 saw real gold prices drop more than 30% to almost $1,000 per ounce. Given the apparent negative correlation, gold appears to be a decent hedge to the U.S. dollar.

Exhibit 14 Gold Prices Have Tended to Move in the Opposite Direction of the U.S. Dollar
1990-2018 real gold spot price ($ per ounce) and real trade-weighted U.S. dollar index



Source: Bureau of Labor Statistics and FRED

Gold as a Safe-Haven Asset

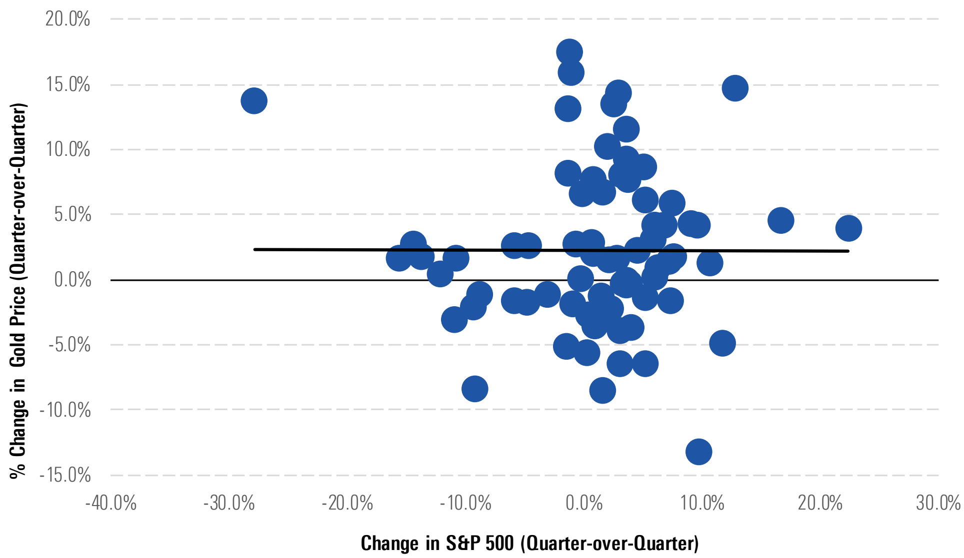
Lastly, we've assessed gold's viability as a safe haven. We define safe-haven assets by their ability to hold, or even increase, in value during periods of trouble or uncertainty. First, we've looked at how gold prices have trended against the U.S. economy in Exhibit 15. Looking at the changes in the real gold price and real GDP growth quarter over quarter since 1990, we see that changes in the gold price hold a weak relationship to U.S. GDP growth. We believe this provides evidence that gold is a decent hedge to U.S. economic cycles.

Exhibit 15 Changes in GDP Have Had a Weak Historical Relationship With Changes in the Gold Price
1990-2018 real gold price change (Q-o-Q) and real GDP change (Q-o-Q)

Source: Bureau of Labor Statistics
Note: Nominal gold prices have been deflated using the U.S. Consumer Price Index.

Next, we've looked at how gold prices have trended against equity markets in Exhibit 16. Looking at the changes in the gold price and S&P 500 quarter over quarter since 2000, we believe the gold price's weak relationship to the S&P 500 provides evidence that gold is a decent hedge to equity markets.

Exhibit 16 Gold Prices Have Moved With Little Correlation to the S&P 500
2000-18 gold price change (Q-o-Q) and S&P 500 change (Q-o-Q)

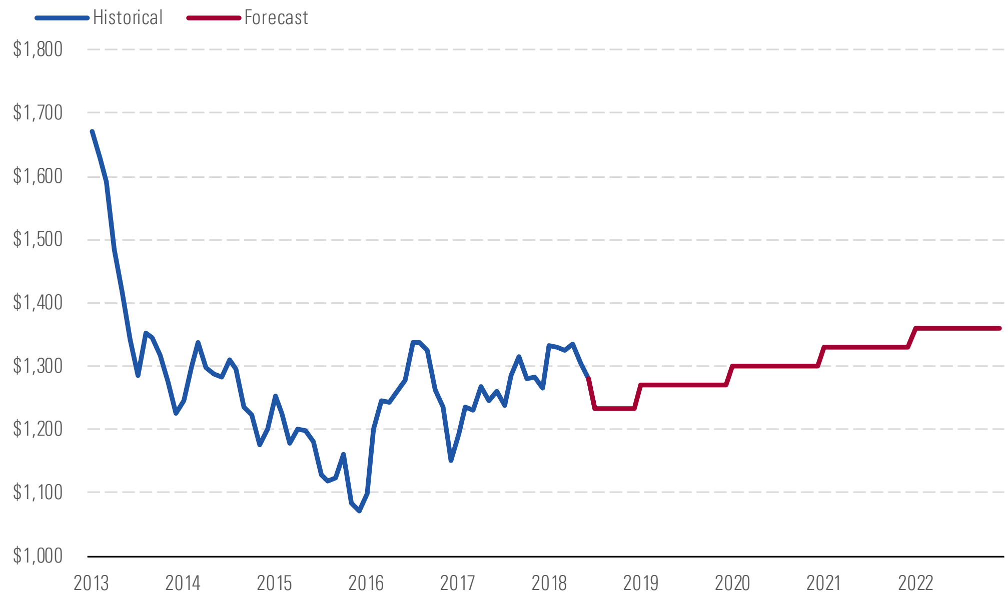


Source: Morningstar

In the beginning of this report, we determined cryptocurrencies to have poor viability as a safe-haven asset. We then established that gold's functional purposes, including for investment purposes that include safe-haven viability, should be sustainable in the long run.

However, in the near term, we expect investment demand for gold to fade as rising interest rates increase opportunity costs. In the vacuum left by retreating investment dollars, we forecast growing demand from jewelry to more than fill the gap over the next few years. China and India, already the two largest gold markets by far, should only see increased demand as incomes rise. In Exhibit 17, we forecast gold prices to decline slightly in the near term before recovering to $1,300 by 2020.

Exhibit 17 Gold Prices Will Fall Slightly in the Near Future Before Recovering Over the Next Few Years
Nominal gold price ($ per ounce)



Source: Morningstar

In an environment where we don't anticipate a major change in the gold price, we see few opportunities among gold miner stocks. In the next section, we take a closer look at the gold miners we cover.

Gold Miners Look Fairly Valued, but We See Upside for Goldcorp

Exhibit 18 Morningstar Gold Coverage Summary

	Agnico-Eagle Mines	AngloGold Ashanti	Barrick Gold	Buenaventura Mining	Eldorado Gold	Goldcorp	IAMGOLD	Kinross Gold	Newmont Mining	Yamana Gold
Ticker	AEM	AU	ABX	BVN	EGO	GG	IAG	KGC	NEM	AUY
Star Rating	★★★	★★★	★★★	★★★	★★★	★★★★	★★★★	★★★	★★★	★★★
Market Cap (B) USD	9.1	3.4	12.2	3.3	0.7	10.0	2.2	3.9	18.5	2.7
Price	38.63	8.31	10.50	13.17	0.97	11.52	4.74	3.11	34.65	2.87
Fair Value	45.00	10.00	13.50	12.00	2.00	16.50	6.50	4.00	36.00	3.00
P/FV	0.86	0.83	0.78	1.10	0.49	0.70	0.73	0.78	0.96	0.96
Moat	None	None	None	None	None	None	None	None	None	None
Moat Trend	Stable	Stable	Stable	Stable	Stable	Positive	Stable	Stable	Stable	Stable
Uncertainty	High	Very High	Very High	Very High	Extreme	Very High	Very High	Very High	Very High	Very High
Valuation										
EV / EBITDA [1]	14.0	4.7	5.5	6.6	9.6	8.0	5.9	5.2	8.4	7.3
EV / Reserves	$487	$111	$257	$1,137	$52	$231	$135	$182	$284	$334
EV / Production	$6,333	$1,673	$3,572	$5,536	$3,010	$5,640	$2,226	$1,949	$3,808	$3,927
Production										
2018E Production	1,580	3,295	4,635	657	300	2,195	879	2,417	5,110	1,096
Reserve Life (years) [2]	13.0	15.0	13.9	4.9	57.7	24.4	16.5	10.7	13.4	11.8
Reserves (million ounces)	20.6	49.5	64.5	3.2	17.3	53.5	14.5	25.9	68.5	12.9
Costs and Profitability										
2018E Cash Costs	$658	$798	$639	$803	$686	$488	$776	$714	$723	$741
EBITDA / Production - 2018E	$452	$355	$652	$839	$315	$707	$377	$372	$454	$540
Leverage										
Net Debt / EBITDA - 2018E [3]	1.24	1.76	1.43	0.53	1.82	1.56	NM	0.89	0.40	2.68

Notes

1. EV / EBITDA based on current price and 2018E adjusted EBITDA.
2. Reserves divided by 2018E production.
3. Net leverage for companies with net cash positions denoted as not meaningful.

Source: Company reports and Morningstar

Limited Opportunities in Gold Miner Coverage Universe

Nearly all gold miners we cover are trading below our fair value estimates. However, after accounting for the relatively high degree of uncertainty associated with gold miners, they are mostly in 3-star territory. Since the beginning of the year, gold has declined from more than $1,350 per ounce to just above $1,200 per ounce. Grown at inflation, the spot price is now within 2% of our long-term nominal gold price of $1,300 by 2020, explaining why we see limited upside potential from a valuation perspective.

Eldorado Gold trades at the largest discount to our fair value estimate at more than 40%. However, the company's extremely concentrated mine portfolio, key development projects that still face high uncertainty from Greek government resistance, and moderate balance sheet pressure mean that its valuation changes dramatically under potential outcomes. As a result, despite the large discount, our extreme uncertainty rating for the company limits the potential risk-adjusted upside.

Undervalued Goldcorp Set to See Increased Production, Higher Reserves, and Lower Costs

Goldcorp is the most undervalued gold miner in our coverage universe on a risk-adjusted basis. Trading more than 25% below our fair value estimate, as shown in Exhibit 19, the market is placing a discount on the company as it undergoes its 20/20/20 growth plan.

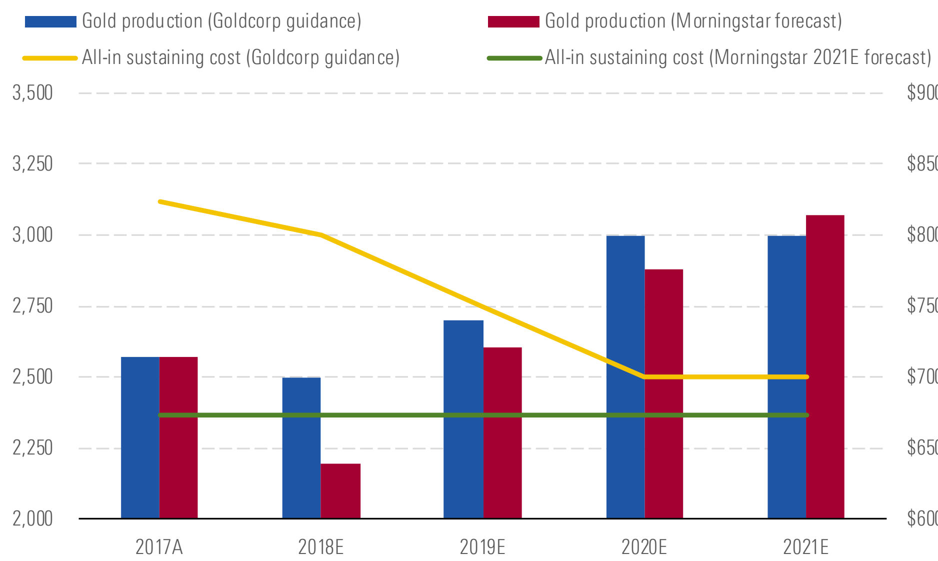
Exhibit 19 Goldcorp Continues to Trade at a Discount to Our Fair Value Estimate
Fair value and price per share

Source: Morningstar

Originally announced in early 2017, the 20/20/20 growth plan aims to achieve a 20% gold production increase, a 20% gold reserves increase, and a 20% all-in sustaining cost decrease by 2021. As shown in Exhibit 20, Goldcorp expects production to reach 3 million gold ounces at AISC of $700 per ounce by

2020, which we think is more than achievable. In comparison, the company produced just over 2.5 million gold ounces at AISC of $824 per ounce in 2017.

Exhibit 20 Goldcorp Management Forecasts Higher Production and Lower Costs by 2020
Gold production in thousands of ounces (left) and all-in sustaining cost in dollars per ounce (right)



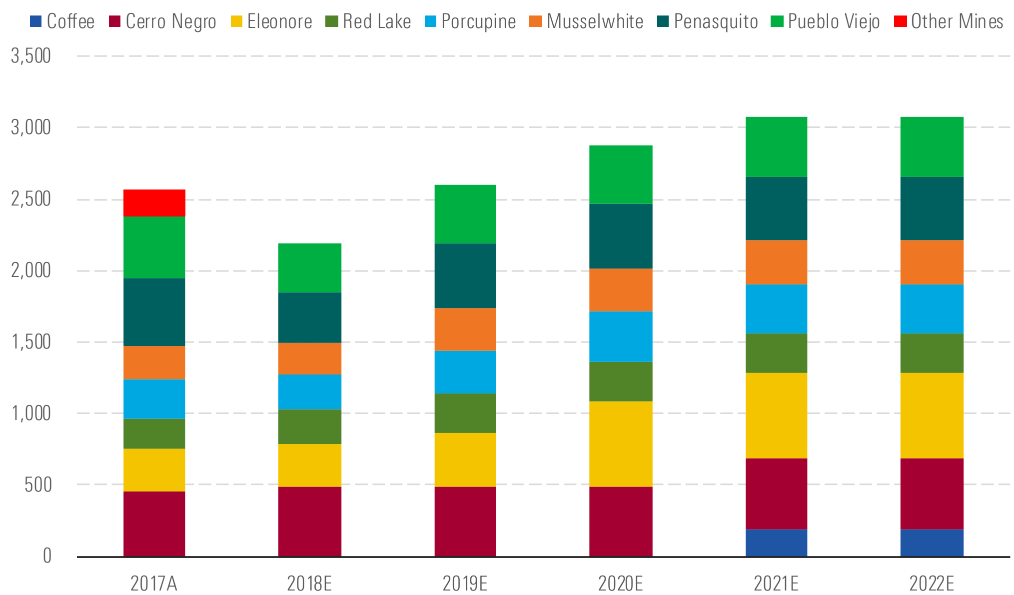
Source: Company filings and Morningstar

In general, gold miners have had a long history of overpromising and underdelivering. Barrick's Pascua-Lama, Yamana's Brazilian mines, or the numerous expensive acquisitions at higher gold prices are just a few examples. However, we think Goldcorp's plan is achievable. One reason for our confidence is that much of the production growth and cost improvement is set to come from projects at existing mines rather than having to rely on the opening of brand new mines. It is notoriously challenging to execute new developments as seamlessly as initially planned. Goldcorp, however, is already intimately familiar with the geology at these existing mines and therefore should have a better grasp on potential execution challenges than competitors pursuing greenfield developments.

In Exhibit 21, we forecast that less than 10% of production in 2021 will come from mines that aren't already open. We forecast the bulk of the production growth will come from completed ramp-ups at Eleonore and Cerro Negro, a shift to better-grade ore and improved recovery from the pyrite leach project at Penasquito, and the materials handling project at Musselwhite.

We expect new production to come from Goldcorp's Coffee and Borden projects. However, given that ore from Borden will be processed at Porcupine's facilities, we still see this project as lower risk than most greenfield developments.

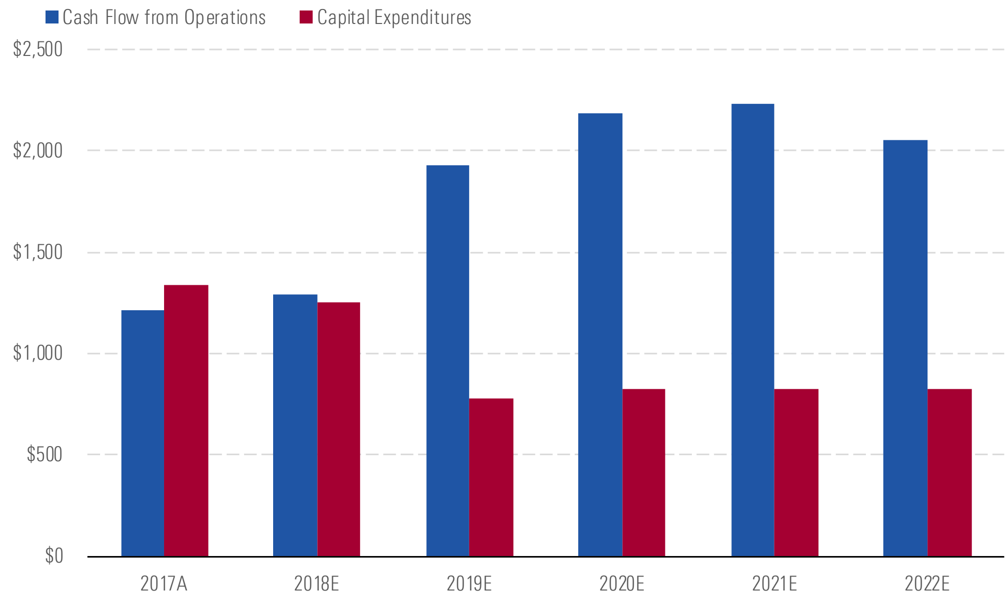
Exhibit 21 Goldcorp's Production Growth Will Primarily Come From Projects at Existing Mines
Morningstar gold production forecast in thousands of ounces



Source: Company filings and Morningstar

An added benefit of brownfield developments is lower capital spending requirements relative to greenfield projects, as these projects can reuse existing assets. Furthermore, because Goldcorp committed to sizable reinvestment last year and into this year, we anticipate its free cash flow generation will improve dramatically beginning in 2019 as capital spending slows and projects reach completion. As shown in Exhibit 22, we forecast free cash flow to rise from nearly break-even in 2018 to more than $1 billion annually in the following years.

Exhibit 22 Goldcorp's Free Cash Flow Generation Will Grow Dramatically as Projects Reach Completion
Dollars in millions



Source: Company filings and Morningstar

Appendix

Limited Data Challenges Our Ability to Assess Cryptocurrencies' Viability as a Safe-Haven Investment

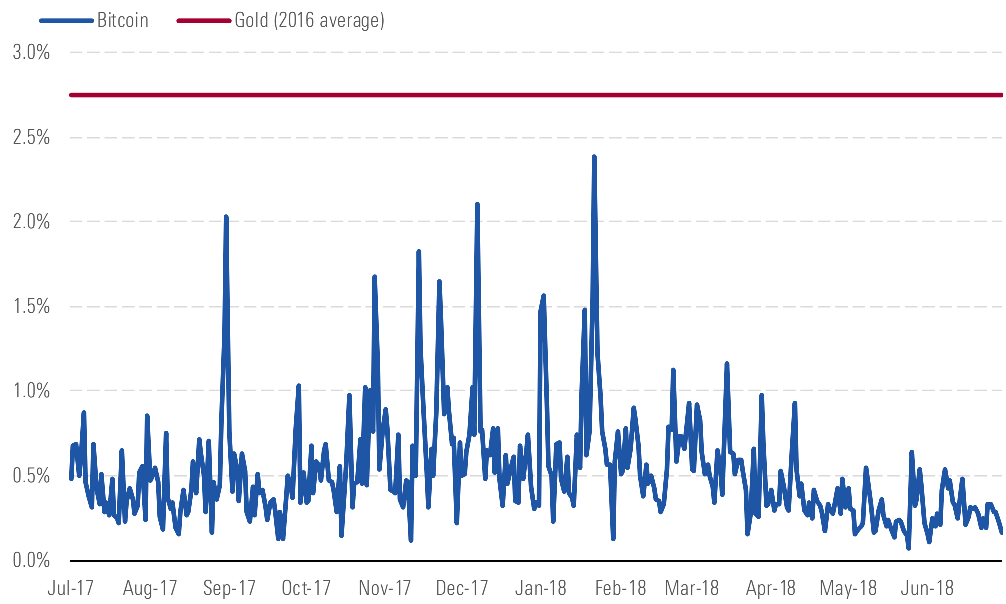
Ideally, we'd assess cryptocurrencies' viability to replace gold as an investment asset by performing quantitative analyses to assess its ability to hedge inflation, hedge the U.S. dollar, and serve as a safe-haven asset[2]. However, three reasons prevent us from getting the same degree of meaningful historical evidence that we have for gold.

First, a limited trading history is a major impediment to drawing conclusions from a quantitative analysis of cryptocurrencies. Bitcoin, the world's most popular cryptocurrency by market capitalization, isn't even 10 years old, having been introduced in 2009. All else equal, there isn't enough trading data across one entire economic cycle, let alone multiple cycles, which would be needed to draw proper conclusions.

Second, although blockchain is a hot topic of discussion as a number of industries rush to implement some form of the technology, its adoption is still nascent. Because the demand for any cryptocurrency depends on the popularity of its related blockchain, the early stages of blockchain adoption means cryptocurrency adoption is also in its early stages. This means that historical data provides us with limited insight. As shown in Exhibit 1A, bitcoin's trading volume remains well below that of gold, which reflects its early adoption levels.

[2] See our analysis of gold's ability to hedge inflation, hedge the U.S. dollar, and serve as a safe-haven asset beginning on Page 14.

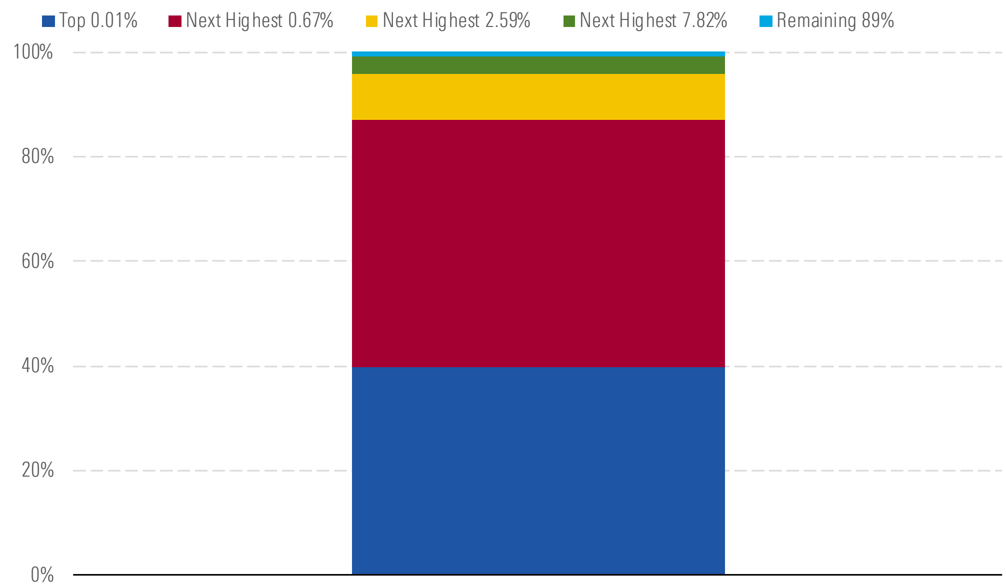
Exhibit 1A Bitcoin's Limited Trading Volume Reflects Nascent Adoption Levels
Daily trading volume as a percentage of market capitalization



Source: Blockchain.com and World Gold Council
Note: We assume all gold ever mined for market capitalization.

Third, ownership of many cryptocurrencies remains significantly concentrated across a relative few individuals. As shown in Exhibit 2A, just 1,500 addresses hold nearly 40% of bitcoins, and just over 130,000 addresses hold nearly 90% of all bitcoins. Concentrated ownership limits cryptocurrency float available for trading. Separately, the fantastic stories of overnight wealth created by cryptocurrencies have been the perfect fuel for heavy speculation, inflating demand. As a result, cryptocurrencies have seen their prices run up, reminiscent of an underpriced, oversubscribed equity initial public offering. This further impairs our ability to use historical data for our analysis.

Exhibit 2A Like Many Cryptocurrencies, Bitcoin Remains in Concentrated Ownership
Percentage of total bitcoins owned by percentage of total addresses



Source: Bitinfocharts.com

Absent concrete data, we'd theorize that a cryptocurrency like bitcoin would be a poor hedge against the economy and the equity market. If the underlying use case for a cryptocurrency is transaction-based as it is for bitcoin, we'd expect that the number of transactions—and thus the overall demand for that cryptocurrency—would decline during a recession. Similarly, according to The Nilson Report, although credit cards have enjoyed secular growth for many years, transactions actually declined in 2009 during the financial crisis, although growth soon resumed.

Since we can't properly vet whether cryptocurrency could hedge against economic cycles, equity market movements, or the U.S. dollar, we've focused on its ability to serve as a safe-haven asset.

Morningstar Equity Research | 26 July 2018

Agnico-Eagle Mines (AEM)

★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
43.4 USD	44.5 USD	High	Standard	None	Stable	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	26.70
Fair Value Estimate	44.50
One-Star Price	68.98
Market Price	43.40
P / FVE	0.98

Estimated COE	7.5%
Pre-Tax Cost of Debt	6.5%
Estimated WACC	6.7%
ROIC *	3.7%
Adjusted ROIC *	4.1%

* 5-Yr Projected Average

Adjusted P / E	233.1	239.1
EV / Adjusted EBITDA	15.3	15.6
EV / Sales	5.2	5.4
Price / Book	2.0	2.1
FCF Yield	-5.1%	-4.9%
Dividend Yield	1.0%	1.0%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		2,243	2,087	2,313	2,755	2,797	2,860	
Gross Profit		1,185	969	1,160	1,430	1,510	1,598	
Operating Income		420	178	309	460	529	602	
Net Income		244	44	131	228	271	317	
Adjusted Income		243	44	131	228	271	317	
Adjusted EPS		1.05	0.19	0.55	0.97	1.15	1.34	
Adjusted EBITDA		928	715	907	1,178	1,259	1,348	
Growth (% YoY)								
Revenue	5.7%	4.9%	-6.9%	10.9%	19.1%	1.5%	2.2%	5.0%
Gross Profit	9.9%	7.1%	-18.2%	19.7%	23.2%	5.6%	5.9%	6.2%
Operating Income	13.9%	72.3%	-57.7%	74.1%	48.8%	15.1%	13.9%	7.5%
Net Income	43.2%	53.6%	-82.1%	199.9%	74.5%	18.8%	16.8%	5.4%
Adjusted EPS	30.8%	138.2%	-82.3%	197.7%	74.5%	18.8%	16.8%	5.0%
Adjusted EBITDA	9.0%	8.4%	-23.0%	26.9%	29.9%	6.9%	7.1%	7.8%
Profitability (%)								
Gross Margin	51.5%	52.8%	46.4%	50.2%	51.9%	54.0%	55.9%	51.7%
Operating Margin	13.0%	18.7%	8.5%	13.4%	16.7%	18.9%	21.1%	15.7%
Net Margin	6.5%	10.9%	2.1%	5.7%	8.3%	9.7%	11.1%	7.4%
Adjusted EBITDA Margin	40.3%	41.4%	34.2%	39.2%	42.7%	45.0%	47.2%	41.7%
Return on Equity	3.1%	5.2%	0.9%	2.6%	4.5%	5.1%	5.8%	3.8%
Adjusted ROIC	3.3%	4.8%	1.8%	2.9%	4.3%	5.1%	6.2%	4.1%
Adjusted RONIC	82.8%	20.1%	-23.4%	95.2%	4070.4%	-10.3%	-10.6%	824.3%
Leverage								
Debt / Capital	21.5%	21.8%	25.5%	26.5%	26.0%	25.4%	24.7%	25.6%
Debt / EBITDA	1.4	1.5	2.4	2.0	1.5	1.4	1.4	1.8
EBITDA / Interest Expense	11.6	11.8	7.2	8.6	11.2	11.9	12.8	10.3
FCFE / Total Debt	0.10	(0.08)	(0.30)	0.02	0.13	0.39	0.42	0.13

Morningstar Equity Research | 9 May 2018

AngloGold Ashanti (AU)

★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
8.9 USD	10.5 USD	Very High	Standard	None	Stable	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	5.25
Fair Value Estimate	10.50
One-Star Price	18.38
Market Price	8.90
P / FVE	0.85

Estimated COE	9.0%
Pre-Tax Cost of Debt	8.0%
Estimated WACC	7.8%
ROIC *	8.5%
Adjusted ROIC *	8.5%

* 5-Yr Projected Average

Adjusted P / E	30.7	36.2
EV / Adjusted EBITDA	4.9	5.5
EV / Sales	1.5	1.7
Price / Book	1.3	1.6
FCF Yield	-6.4%	-5.4%
Dividend Yield	1.1%	1.0%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		4,356	3,794	3,756	3,938	4,425	4,525	
Gross Profit		774	640	810	880	1,061	1,166	
Operating Income		530	315	507	574	751	881	
Net Income		(191)	121	220	265	395	497	
Adjusted Income		1,001	121	248	293	423	525	
Adjusted EPS		2.41	0.29	0.60	0.71	1.02	1.26	
Adjusted EBITDA		1,483	1,170	1,338	1,422	1,661	1,713	
Growth (% YoY)								
Revenue	-5.8%	6.6%	-12.9%	-1.0%	4.8%	12.4%	2.2%	0.8%
Gross Profit	-9.0%	-5.8%	-17.3%	26.5%	8.7%	20.6%	9.8%	8.5%
Operating Income	-10.5%	0.2%	-40.5%	60.8%	13.1%	30.9%	17.4%	10.7%
Net Income	NM	-403.2%	-163.2%	82.1%	20.7%	48.9%	25.8%	NM
Adjusted EPS	NM	970.1%	-87.9%	105.3%	18.3%	44.2%	24.1%	-12.1%
Adjusted EBITDA	-3.8%	-3.8%	-21.1%	14.4%	6.2%	16.9%	3.1%	2.9%
Profitability (%)								
Gross Margin	18.6%	17.8%	16.9%	21.6%	22.3%	24.0%	25.8%	22.1%
Operating Margin	12.5%	12.2%	8.3%	13.5%	14.6%	17.0%	19.5%	14.6%
Net Margin	-0.7%	-4.4%	3.2%	5.8%	6.7%	8.9%	11.0%	7.1%
Adjusted EBITDA Margin	36.3%	34.0%	30.8%	35.6%	36.1%	37.5%	37.9%	35.6%
Return on Equity	-1.2%	-7.1%	4.5%	7.8%	8.7%	11.9%	13.3%	9.2%
Adjusted ROIC	9.0%	8.7%	5.6%	7.7%	8.2%	10.0%	11.0%	8.5%
Adjusted RONIC	11.9%	43.4%	-215.5%	38.3%	22.8%	95.7%	43.8%	-3.0%
Leverage								
Debt / Capital	47.8%	46.0%	45.3%	44.8%	43.0%	38.3%	32.1%	40.7%
Debt / EBITDA	2.1	2.5	2.1	2.0	1.8	1.4	1.2	1.7
EBITDA / Interest Expense	5.8	5.4	7.5	8.2	8.7	11.3	13.8	9.9
FCFE / Total Debt	0.15	0.06	(0.10)	(0.05)	0.03	0.13	0.18	0.04

Morningstar Equity Research | 26 July 2018

Barrick Gold (ABX)

★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
11.82 USD	13.7 USD	Very High	Standard	None	Stable	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	6.85
Fair Value Estimate	13.70
One-Star Price	23.98
Market Price	11.82
P / FVE	0.86

Estimated COE	7.5%
Pre-Tax Cost of Debt	6.5%
Estimated WACC	6.8%
ROIC *	5.8%
Adjusted ROIC *	1.9%

* 5-Yr Projected Average

Adjusted P / E	41.2	47.8
EV / Adjusted EBITDA	5.9	6.7
EV / Sales	2.4	2.6
Price / Book	1.5	1.7
FCF Yield	5.3%	4.6%
Dividend Yield	1.0%	0.9%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		8,374	7,631	7,164	7,188	7,286	7,590	
Gross Profit		3,074	2,030	1,898	1,866	1,886	2,028	
Operating Income		3,347	1,210	1,056	1,001	1,002	1,124	
Net Income		1,438	334	359	325	328	409	
Adjusted Income		876	334	359	325	328	409	
Adjusted EPS		0.75	0.29	0.31	0.28	0.28	0.35	
Adjusted EBITDA		4,975	3,022	2,732	2,714	2,753	2,938	
Growth (% YoY)								
Revenue	-6.5%	-2.2%	-8.9%	-6.1%	0.3%	1.4%	4.2%	-1.9%
Gross Profit	-3.4%	-2.5%	-34.0%	-6.5%	-1.7%	1.1%	7.5%	-8.0%
Operating Income	11.2%	27.7%	-63.8%	-12.7%	-5.2%	0.0%	12.2%	-19.6%
Net Income	NM	119.5%	-76.7%	7.4%	-9.5%	0.7%	25.0%	-22.2%
Adjusted EPS	3.3%	7.0%	-61.8%	7.4%	-9.5%	0.7%	25.0%	-14.1%
Adjusted EBITDA	9.3%	23.7%	-39.3%	-9.6%	-0.6%	1.4%	6.7%	-10.0%
Profitability (%)								
Gross Margin	32.4%	36.7%	26.6%	26.5%	26.0%	25.9%	26.7%	26.3%
Operating Margin	29.6%	40.0%	15.9%	14.7%	13.9%	13.7%	14.8%	14.6%
Net Margin	-2.2%	17.2%	4.4%	5.0%	4.5%	4.5%	5.4%	4.8%
Adjusted EBITDA Margin	47.8%	59.4%	39.6%	38.1%	37.8%	37.8%	38.7%	38.4%
Return on Equity	-2.4%	16.7%	3.6%	3.7%	3.3%	3.3%	4.0%	3.6%
Adjusted ROIC	4.0%	5.5%	2.1%	1.8%	1.7%	1.8%	2.0%	1.9%
Adjusted RONIC	-60.2%	-54.1%	398.5%	15.6%	6.8%	-0.0%	2548.5%	593.9%
Leverage								
Debt / Capital	49.7%	40.9%	40.3%	39.8%	39.3%	38.9%	38.2%	39.3%
Debt / EBITDA	NM	1.3	2.2	2.3	2.4	2.3	2.2	2.3
EBITDA / Interest Expense	3.9	7.2	5.6	5.2	5.1	5.2	5.6	5.3
FCFE / Total Debt	0.13	0.10	0.12	0.17	0.15	0.14	0.07	0.13

Morningstar Equity Research | 27 July 2018

Buenaventura Mining (BVN)

★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
13.56 USD	12.3 USD	Very High	Standard	None	Stable	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	6.15
Fair Value Estimate	12.30
One-Star Price	21.53
Market Price	13.56
P / FVE	1.10

Estimated COE	7.5%
Pre-Tax Cost of Debt	6.5%
Estimated WACC	7.1%
ROIC *	11.9%
Adjusted ROIC *	11.9%

* 5-Yr Projected Average

Adjusted P / E	15.9	14.5
EV / Adjusted EBITDA	7.2	6.6
EV / Sales	3.4	3.1
Price / Book	1.1	1.0
FCF Yield	4.6%	5.1%
Dividend Yield	1.2%	1.4%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		1,274	1,173	1,214	1,283	1,301	1,331	
Gross Profit		634	557	614	672	678	696	
Operating Income		140	295	298	295	274	291	
Net Income		71	215	236	247	229	248	
Adjusted Income		86	216	236	247	229	248	
Adjusted EPS		0.34	0.85	0.93	0.97	0.90	0.98	
Adjusted EBITDA		714	551	600	644	615	635	
Growth (% YoY)								
Revenue	3.0%	19.2%	-7.9%	3.5%	5.7%	1.4%	2.3%	0.9%
Gross Profit	4.8%	13.2%	-12.1%	10.2%	9.4%	0.9%	2.7%	1.9%
Operating Income	NM	-160.2%	109.9%	1.3%	-1.0%	-7.1%	6.1%	15.7%
Net Income	NM	-123.3%	203.3%	9.9%	4.3%	-7.3%	8.3%	28.4%
Adjusted EPS	NM	-128.0%	151.2%	9.5%	4.3%	-7.3%	8.3%	23.6%
Adjusted EBITDA	9.5%	143.7%	-22.8%	8.9%	7.3%	-4.5%	3.3%	-2.3%
Profitability (%)								
Gross Margin	46.7%	49.7%	47.5%	50.6%	52.4%	52.1%	52.3%	51.0%
Operating Margin	-14.4%	11.0%	25.1%	24.6%	23.0%	21.1%	21.9%	23.1%
Net Margin	-18.4%	5.6%	18.3%	19.5%	19.2%	17.6%	18.6%	18.6%
Adjusted EBITDA Margin	25.1%	56.1%	47.0%	49.4%	50.2%	47.3%	47.7%	48.3%
Return on Equity	-5.7%	2.5%	7.3%	7.6%	7.5%	6.5%	6.7%	7.1%
Adjusted ROIC	14.6%	28.5%	11.3%	12.4%	13.1%	11.5%	11.5%	11.9%
Adjusted RONIC	-2944.9%	-578.4%	-443.6%	28.4%	23.3%	-16.2%	10.4%	-79.6%
Leverage								
Debt / Capital	18.7%	20.4%	17.8%	19.0%	18.1%	17.4%	16.6%	17.8%
Debt / EBITDA	0.4	6.0	1.3	1.4	1.4	1.5	1.5	1.4
EBITDA / Interest Expense	NM	3.5	15.0	14.9	13.8	13.2	13.7	14.1
FCFE / Total Debt	NM	(0.06)	0.24	0.19	0.19	0.17	0.19	0.20

Morningstar Equity Research | 27 July 2018

Eldorado Gold (EGO) ★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
1.09 USD	2.04 USD	Extreme	Standard	None	Stable	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	
Fair Value Estimate	2.04
One-Star Price	
Market Price	1.09
P / FVE	0.53

Estimated COE	7.5%
Pre-Tax Cost of Debt	10.0%
Estimated WACC	7.3%
ROIC *	1.8%
Adjusted ROIC *	1.8%

* 5-Yr Projected Average

Adjusted P / E	(184.7)	(345.6)
EV / Adjusted EBITDA	9.9	17.4
EV / Sales	2.0	3.6
Price / Book	0.2	0.4
FCF Yield	-30.5%	-16.3%
Dividend Yield	0.0%	0.0%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		391	458	475	570	848	1,137	
Gross Profit		198	183	210	282	428	657	
Operating Income		17	27	46	91	205	419	
Net Income		(21)	(18)	(10)	(4)	53	179	
Adjusted Income		(334)	(4)	(2)	4	61	186	
Adjusted EPS		(0.44)	(0.01)	(0.00)	0.00	0.08	0.25	
Adjusted EBITDA		89	94	125	184	328	545	
Growth (% YoY)								
Revenue	-28.4%	-9.5%	17.0%	3.8%	19.9%	48.8%	34.2%	23.8%
Gross Profit	-29.2%	-16.7%	-7.6%	14.6%	34.2%	51.9%	53.4%	27.1%
Operating Income	-60.0%	-80.3%	54.9%	72.8%	96.5%	125.6%	103.8%	89.1%
Net Income	-159.3%	-93.8%	-14.6%	-44.5%	-60.4%	-1416.3%	237.9%	NM
Adjusted EPS	-242.8%	3320.8%	-98.7%	-45.0%	-249.8%	1550.8%	207.7%	NM
Adjusted EBITDA	-41.5%	-45.0%	5.5%	32.2%	47.8%	77.7%	66.2%	43.5%
Profitability (%)								
Gross Margin	49.9%	50.6%	40.0%	44.2%	49.5%	50.5%	57.8%	48.4%
Operating Margin	11.9%	4.4%	5.9%	9.8%	16.0%	24.2%	36.8%	18.5%
Net Margin	-87.8%	-5.5%	-4.0%	-2.1%	-0.7%	6.2%	15.7%	3.0%
Adjusted EBITDA Margin	30.7%	22.9%	20.6%	26.3%	32.4%	38.7%	47.9%	33.2%
Return on Equity	-14.8%	-0.6%	-0.5%	-0.3%	-0.1%	1.5%	4.8%	1.1%
Adjusted ROIC	0.9%	0.3%	0.5%	0.7%	1.1%	2.3%	4.4%	1.8%
Adjusted RONIC	0.5%	-7.5%	3.3%	2.0%	5.6%	27.1%	85.3%	24.7%
Leverage								
Debt / Capital	14.0%	14.0%	14.1%	23.2%	32.6%	34.7%	33.6%	27.6%
Debt / EBITDA	4.0	7.8	8.2	9.7	10.1	6.2	3.7	7.6
EBITDA / Interest Expense	NM	23.8	2.0	2.2	2.0	2.8	4.5	2.7
FCFE / Total Debt	NM	(0.50)	(0.42)	(0.52)	(0.29)	(0.10)	0.02	NM

Morningstar Equity Research | 25 July 2018

Goldcorp (GG)

★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
13.36 USD	16.7 USD	Very High	Standard	None	Positive	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	8.35
Fair Value Estimate	16.70
One-Star Price	29.23
Market Price	13.36
P / FVE	0.80

Estimated COE	7.5%
Pre-Tax Cost of Debt	6.5%
Estimated WACC	7.0%
ROIC *	4.1%
Adjusted ROIC *	4.1%

* 5-Yr Projected Average

Adjusted P / E	49.2	61.5
EV / Adjusted EBITDA	8.9	10.8
EV / Sales	4.1	4.9
Price / Book	0.8	1.0
FCF Yield	0.3%	0.3%
Dividend Yield	0.6%	0.5%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		3,423	3,379	4,657	5,001	5,068	5,182	
Gross Profit		1,534	1,483	2,226	2,533	2,590	2,649	
Operating Income		528	525	1,025	1,197	1,253	1,957	
Net Income		658	235	591	703	739	1,197	
Adjusted Income		1,347	235	591	703	739	1,197	
Adjusted EPS		1.56	0.27	0.68	0.81	0.85	1.38	
Adjusted EBITDA		1,518	1,552	2,356	2,664	2,723	2,785	
Growth (% YoY)								
Revenue	-0.1%	-2.5%	-1.3%	37.8%	7.4%	1.3%	2.2%	8.6%
Gross Profit	4.2%	6.2%	-3.3%	50.1%	13.8%	2.3%	2.2%	11.5%
Operating Income	5.9%	47.9%	-0.7%	95.4%	16.8%	4.6%	56.3%	30.0%
Net Income	NM	306.2%	-64.3%	151.5%	19.0%	5.1%	62.0%	12.7%
Adjusted EPS	55.3%	719.4%	-82.6%	151.5%	19.0%	5.1%	62.0%	-2.3%
Adjusted EBITDA	8.2%	9.9%	2.2%	51.8%	13.1%	2.2%	2.2%	12.9%
Profitability (%)								
Gross Margin	42.3%	44.8%	43.9%	47.8%	50.6%	51.1%	51.1%	48.9%
Operating Margin	8.5%	15.4%	15.5%	22.0%	23.9%	24.7%	37.8%	24.8%
Net Margin	-23.7%	19.2%	7.0%	12.7%	14.1%	14.6%	23.1%	14.3%
Adjusted EBITDA Margin	39.2%	44.3%	45.9%	50.6%	53.3%	53.7%	53.7%	51.5%
Return on Equity	-7.3%	4.8%	1.6%	4.0%	4.6%	4.7%	7.2%	4.4%
Adjusted ROIC	-1.5%	-1.6%	1.7%	3.4%	4.1%	4.4%	7.0%	4.1%
Adjusted RONIC	-67.9%	-366.6%	293.9%	-63.9%	-18.1%	-5.6%	14228.9%	2887.0%
Leverage								
Debt / Capital	16.0%	14.9%	15.2%	14.8%	14.2%	13.7%	13.0%	14.2%
Debt / EBITDA	0.9	1.9	1.7	1.1	1.0	0.9	0.9	1.1
EBITDA / Interest Expense	NM	9.9	13.4	20.3	23.0	23.5	24.0	20.9
FCFE / Total Debt	0.03	(0.05)	0.01	0.45	0.53	0.55	0.48	0.40

Morningstar Equity Research | 8 May 2018

IAMGOLD Corporation (IAG)

★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
5.14 USD	6.5 USD	Very High	Standard	None	Stable	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	3.25
Fair Value Estimate	6.50
One-Star Price	11.38
Market Price	5.14
P / FVE	0.79

Estimated COE	7.5%
Pre-Tax Cost of Debt	6.5%
Estimated WACC	7.0%
ROIC *	3.3%
Adjusted ROIC *	3.3%

* 5-Yr Projected Average

Adjusted P / E	458.0	579.1
EV / Adjusted EBITDA	6.4	8.3
EV / Sales	2.0	2.6
Price / Book	0.9	1.1
FCF Yield	-0.9%	-0.7%
Dividend Yield	0.0%	0.0%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		1,095	1,077	1,140	1,165	1,191	1,654	
Gross Profit		418	416	440	475	488	724	
Operating Income		89	54	61	93	104	386	
Net Income		502	5	42	60	63	224	
Adjusted Income		71	5	42	60	63	224	
Adjusted EPS		0.15	0.01	0.09	0.13	0.13	0.48	
Adjusted EBITDA		355	331	353	385	395	618	
Growth (% YoY)								
Revenue	2.8%	10.9%	-1.7%	5.8%	2.3%	2.3%	38.8%	8.6%
Gross Profit	6.9%	15.1%	-0.5%	5.7%	7.9%	2.8%	48.3%	11.6%
Operating Income	309.4%	136.0%	-39.6%	13.3%	52.7%	11.2%	272.7%	34.0%
Net Income	NM	853.6%	-99.0%	692.1%	45.3%	4.0%	256.9%	-14.9%
Adjusted EPS	NM	15.8%	-92.6%	692.1%	45.3%	4.0%	256.9%	25.9%
Adjusted EBITDA	15.2%	17.9%	-6.7%	6.4%	9.2%	2.7%	56.4%	11.7%
Profitability (%)								
Gross Margin	32.5%	38.2%	38.7%	38.6%	40.8%	41.0%	43.8%	40.6%
Operating Margin	-0.2%	8.1%	5.0%	5.4%	8.0%	8.7%	23.3%	10.1%
Net Margin	-10.4%	45.8%	0.5%	3.6%	5.2%	5.3%	13.6%	5.6%
Adjusted EBITDA Margin	26.4%	32.4%	30.8%	30.9%	33.0%	33.2%	37.4%	33.1%
Return on Equity	-3.6%	20.0%	0.2%	1.5%	2.1%	2.1%	7.3%	2.6%
Adjusted ROIC	1.2%	4.5%	1.5%	1.7%	2.4%	2.4%	8.5%	3.3%
Adjusted RONIC	3184.5%	13.8%	60.5%	41.7%	7.3%	2.4%	183.5%	59.1%
Leverage								
Debt / Capital	19.0%	12.3%	12.3%	12.2%	12.0%	11.7%	11.0%	11.8%
Debt / EBITDA	0.2	0.5	1.2	1.1	1.0	1.0	0.6	1.0
EBITDA / Interest Expense	26.2	79.7	30.2	32.2	35.1	36.1	56.4	38.0
FCFE / Total Debt	NM	0.19	(0.06)	0.10	(0.64)	(0.61)	0.46	NM

Morningstar Equity Research | 2 August 2018

Kinross Gold (KGC)

★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
3.45 USD	3.98 USD	Very High	Poor	None	Stable	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	1.99
Fair Value Estimate	3.98
One-Star Price	6.97
Market Price	3.45
P / FVE	0.87

Estimated COE	9.0%
Pre-Tax Cost of Debt	6.5%
Estimated WACC	7.9%
ROIC *	2.6%
Adjusted ROIC *	2.7%

* 5-Yr Projected Average

Adjusted P / E	261.3	301.4
EV / Adjusted EBITDA	5.6	6.3
EV / Sales	1.7	1.9
Price / Book	0.9	1.1
FCF Yield	-6.3%	-5.4%
Dividend Yield	0.0%	0.0%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		3,303	3,046	3,163	3,266	3,109	3,132	
Gross Profit		1,546	1,273	1,355	1,394	1,412	1,478	
Operating Income		358	136	19	20	410	467	
Net Income		445	22	(54)	(53)	231	275	
Adjusted Income		271	17	(68)	(68)	217	261	
Adjusted EPS		0.22	0.01	(0.05)	(0.05)	0.17	0.21	
Adjusted EBITDA		1,177	898	1,018	1,048	1,073	1,134	
Growth (% YoY)								
Revenue	-1.6%	-4.9%	-7.8%	3.8%	3.3%	-4.8%	0.7%	-1.1%
Gross Profit	1.1%	3.9%	-17.6%	6.4%	2.9%	1.3%	4.6%	-0.9%
Operating Income	16.9%	92.6%	-62.0%	-85.9%	5.1%	1933.7%	13.9%	5.5%
Net Income	NM	-528.3%	-95.1%	-347.7%	-1.0%	-532.2%	19.0%	-9.2%
Adjusted EPS	8.1%	134.2%	-93.9%	-511.0%	-0.1%	-418.7%	20.2%	-0.8%
Adjusted EBITDA	2.3%	13.1%	-23.7%	13.4%	2.9%	2.4%	5.7%	-0.8%
Profitability (%)								
Gross Margin	43.2%	46.8%	41.8%	42.8%	42.7%	45.4%	47.2%	44.0%
Operating Margin	4.9%	10.8%	4.5%	0.6%	0.6%	13.2%	14.9%	6.8%
Net Margin	-7.3%	13.5%	0.7%	-1.7%	-1.6%	7.4%	8.8%	2.7%
Adjusted EBITDA Margin	31.2%	35.6%	29.5%	32.2%	32.1%	34.5%	36.2%	32.9%
Return on Equity	-5.0%	10.2%	0.5%	-1.2%	-1.2%	5.0%	5.7%	1.8%
Adjusted ROIC	1.2%	3.4%	1.8%	0.2%	0.3%	5.2%	6.0%	2.7%
Adjusted RONIC	31.7%	136.5%	-25.1%	-765.9%	3.3%	-410.0%	-295.9%	-298.7%
Leverage								
Debt / Capital	30.2%	27.4%	27.3%	27.6%	27.8%	26.8%	25.7%	27.0%
Debt / EBITDA	5.9	1.3	1.9	1.7	1.6	1.6	1.5	1.7
EBITDA / Interest Expense	6.6	11.4	7.5	8.6	8.8	9.0	9.5	8.7
FCFE / Total Debt	0.14	0.03	(0.16)	(0.03)	(0.03)	0.18	0.17	0.03

Morningstar Equity Research | 26 July 2018

Newmont Mining Corporation (NEM)

★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
38.45 USD	36 USD	Very High	Standard	None	Stable	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	18.00
Fair Value Estimate	36.00
One-Star Price	63.00
Market Price	38.45
P / FVE	1.07

Estimated COE	7.5%
Pre-Tax Cost of Debt	6.5%
Estimated WACC	6.9%
ROIC *	7.5%
Adjusted ROIC *	7.5%

* 5-Yr Projected Average

Adjusted P / E	34.2	32.0
EV / Adjusted EBITDA	9.2	8.6
EV / Sales	3.0	2.8
Price / Book	1.9	1.8
FCF Yield	3.2%	3.4%
Dividend Yield	1.5%	1.6%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		7,348	7,143	7,141	6,970	7,361	7,526	
Gross Profit		3,310	3,089	3,323	3,206	3,373	3,449	
Operating Income		1,347	1,038	1,315	1,241	1,287	1,345	
Net Income		(60)	602	772	723	756	796	
Adjusted Income		(60)	602	772	723	756	796	
Adjusted EPS		(0.11)	1.12	1.44	1.35	1.41	1.49	
Adjusted EBITDA		2,596	2,320	2,620	2,480	2,566	2,032	
Growth (% YoY)								
Revenue	0.3%	9.5%	-2.8%	-0.0%	-2.4%	5.6%	2.3%	0.5%
Gross Profit	5.3%	12.6%	-6.7%	7.6%	-3.5%	5.2%	2.3%	0.8%
Operating Income	14.7%	30.0%	-22.9%	26.7%	-5.6%	3.7%	4.5%	-0.0%
Net Income	-147.8%	-87.9%	-1102.5%	28.4%	-6.3%	4.6%	5.3%	NM
Adjusted EPS	-146.3%	-102.0%	-1095.5%	28.4%	-6.3%	4.6%	5.3%	NM
Adjusted EBITDA	7.0%	15.1%	-10.6%	12.9%	-5.4%	3.5%	-20.8%	-4.8%
Profitability (%)								
Gross Margin	44.4%	45.0%	43.2%	46.5%	46.0%	45.8%	45.8%	45.5%
Operating Margin	17.1%	18.3%	14.5%	18.4%	17.8%	17.5%	17.9%	17.2%
Net Margin	-1.9%	-0.8%	8.4%	10.8%	10.4%	10.3%	10.6%	10.1%
Adjusted EBITDA Margin	34.1%	35.3%	32.5%	36.7%	35.6%	34.9%	27.0%	33.3%
Return on Equity	-1.1%	-0.6%	5.6%	6.9%	6.2%	6.2%	6.3%	6.2%
Adjusted ROIC	8.8%	13.7%	5.8%	7.5%	7.4%	8.1%	8.7%	7.5%
Adjusted RONIC	-31.3%	-124.5%	-54779.5%	-32.7%	8.1%	-6.0%	130.2%	-10936.0%
Leverage								
Debt / Capital	31.1%	27.7%	27.1%	26.1%	25.2%	24.5%	23.7%	25.3%
Debt / EBITDA	2.5	1.6	1.7	1.5	1.6	1.6	2.0	1.7
EBITDA / Interest Expense	7.7	10.7	11.9	13.6	13.0	13.6	10.8	12.6
FCFE / Total Debt	0.22	0.37	0.16	0.35	0.34	0.33	0.20	0.28

Morningstar Equity Research | 27 July 2018

Yamana Gold (AUY)

★★★

Last Price	Fair Value	Uncertainty	Stewardship	Economic Moat	Moat Trend	Morningstar Credit Rating
3.04 USD	2.96 USD	Very High	Standard	None	Stable	N/A

Analyst	Kristoffer Inton
Phone & Email	312-384-4897
	kristoffer.inton@morningstar.com
Sector	Basic Materials
Industry	Gold

Five-Star Price	1.48
Fair Value Estimate	2.96
One-Star Price	5.18
Market Price	3.04
P / FVE	1.03

Estimated COE	7.5%
Pre-Tax Cost of Debt	8.0%
Estimated WACC	6.8%
ROIC *	1.3%
Adjusted ROIC *	1.3%

* 5-Yr Projected Average

Adjusted P / E	61.2	59.6
EV / Adjusted EBITDA	7.6	7.4
EV / Sales	2.4	2.4
Price / Book	0.7	0.7
FCF Yield	8.4%	8.6%
Dividend Yield	0.7%	0.7%
(2018 Estimates)	(Price)	(Fair Value)

All values (except per share amounts) in: USD Millions	3-Yr CAGR/AVG	2017	Forecast 2018	2019	2020	2021	2022	5-Yr Projected CAGR/AVG
Income Statement								
Revenue		1,804	1,868	1,858	1,985	2,010	2,055	
Gross Profit		761	839	862	930	931	952	
Operating Income		176	148	208	276	288	292	
Net Income		(194)	(20)	87	127	136	82	
Adjusted Income		34	47	87	127	136	82	
Adjusted EPS		0.04	0.05	0.09	0.13	0.14	0.09	
Adjusted EBITDA		603	592	610	672	667	654	
Growth (% YoY)								
Revenue	-0.6%	0.9%	3.6%	-0.6%	6.9%	1.2%	2.2%	2.6%
Gross Profit	-1.2%	0.4%	10.2%	2.8%	7.9%	0.1%	2.2%	4.6%
Operating Income	NM	24.4%	-16.1%	40.4%	32.9%	4.4%	1.2%	10.6%
Net Income	NM	-33.1%	-89.8%	-538.3%	45.6%	7.1%	-39.6%	NM
Adjusted EPS	NM	29384.3%	36.9%	84.7%	45.6%	7.1%	-39.6%	19.0%
Adjusted EBITDA	10.2%	-0.1%	-1.9%	3.0%	10.2%	-0.8%	-1.9%	1.6%
Profitability (%)								
Gross Margin	41.7%	42.2%	44.9%	46.4%	46.9%	46.3%	46.3%	46.2%
Operating Margin	5.3%	9.8%	7.9%	11.2%	13.9%	14.3%	14.2%	12.3%
Net Margin	-47.4%	-10.8%	-1.1%	4.7%	6.4%	6.8%	4.0%	4.1%
Adjusted EBITDA Margin	31.7%	33.4%	31.7%	32.8%	33.8%	33.2%	31.8%	32.7%
Return on Equity	-15.7%	-4.4%	-0.5%	2.0%	2.9%	3.0%	1.8%	1.8%
Adjusted ROIC	-0.2%	0.2%	0.8%	1.1%	1.5%	1.5%	1.6%	1.3%
Adjusted RONIC	-59.1%	-40.8%	-110.4%	-43.9%	-57.6%	-14.8%	-7.3%	-46.8%
Leverage								
Debt / Capital	26.8%	28.8%	28.4%	28.1%	30.4%	29.9%	48.5%	33.1%
Debt / EBITDA	NM	7.1	3.5	2.8	2.9	2.9	6.7	3.7
EBITDA / Interest Expense	NM	1.7	6.2	7.8	7.5	7.4	3.2	6.4
FCFE / Total Debt	0.03	(0.09)	0.14	0.11	0.11	0.10	0.03	0.10

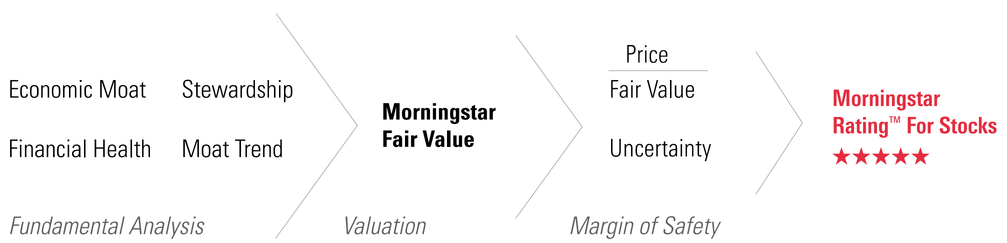
Research Methodology for Valuing Companies

Overview

At the heart of our valuation system is a detailed projection of a company's future cash flows, resulting from our analysts' research. Analysts create custom industry and company assumptions to feed income statement, balance sheet, and capital investment assumptions into our globally standardized, proprietary discounted cash flow, or DCF, modeling templates. We use scenario analysis, in-depth competitive advantage analysis, and a variety of other analytical tools to augment this process. Moreover, we think analyzing valuation through discounted cash flows presents a better lens for viewing cyclical companies, high-growth firms, businesses with finite lives (e.g., mines), or companies expected to generate negative earnings over the next few years. That said, we don't dismiss multiples altogether but rather use them as supporting cross-checks for our DCF-based fair value estimates. We also acknowledge that DCF models offer their own challenges (including a potential proliferation of estimated inputs and the possibility that the method may miss short-term market-price movements), but we believe these negatives are mitigated by deep analysis and our long-term approach.

Morningstar's equity research group (we", "our") believes that a company's intrinsic worth results from the future cash flows it can generate. The Morningstar Rating for stocks identifies stocks trading at a discount or premium to their intrinsic worth—or fair value estimate, in Morningstar terminology. Five-star stocks sell for the biggest risk-adjusted discount to their fair values, whereas 1-star stocks trade at premiums to their intrinsic worth.

Morningstar Research Methodology



Source: Morningstar.

Four key components drive the Morningstar rating: (1) our assessment of the firm's economic moat, (2) our estimate of the stock's fair value, (3) our uncertainty around that fair value estimate and (4) the current market price. This process ultimately culminates in our single-point star rating.

Economic Moat

The concept of an economic moat plays a vital role not only in our qualitative assessment of a firm's long-term investment potential, but also in the actual calculation of our fair value estimates. An economic moat is a structural feature that allows a firm to sustain excess profits over a long period of time. We define economic profits as returns on invested capital (or ROIC) over and above our estimate of a firm's cost of capital, or weighted average cost of capital (or WACC). Without a moat, profits are more susceptible to competition. We have identified five sources of economic moats: intangible assets, switching costs, network effect, cost advantage, and efficient scale.

Companies with a narrow moat are those we believe are more likely than not to achieve normalized excess returns for at least the next 10 years. Wide-moat companies are those in which we have very high confidence that excess returns will remain for 10 years, with excess returns more likely than not to remain for at least 20 years. The longer a firm generates economic profits, the higher its intrinsic value. We believe low-quality, no-moat companies will see their normalized returns gravitate toward the firm's cost of capital more quickly than companies with moats.

To assess the sustainability of excess profits, analysts perform ongoing assessments of the moat trend. A firm's moat trend is positive in cases where we think its sources of competitive advantage are growing stronger; stable where we don't anticipate changes to competitive advantages over the next several years; or negative when we see signs of deterioration.

Estimated Fair Value

Combining our analysts' financial forecasts with the firm's economic moat helps us assess how long returns on invested capital are likely to exceed the firm's cost of capital. Returns of firms with a wide economic moat rating are assumed to fade to the perpetuity period over a longer period of time than the returns of narrow-moat firms, and both will fade slower than no-moat firms, increasing our estimate of their intrinsic value.

Our model is divided into three distinct stages:

Stage I: Explicit Forecast
In this stage, which can last five to 10 years, analysts make full financial statement forecasts, including items such as revenue, profit margins, tax rates, changes in working-capital accounts, and capital spending. Based on these projections, we calculate earnings before interest, after taxes (EBI) and the net new investment (NNI) to derive our annual free cash flow forecast.

Stage II: Fade
The second stage of our model is the period it will take the company's return on new invested capital—the return on capital of the next dollar invested ("RONIC")—to decline (or rise) to its cost of capital. During the Stage II period, we use a formula to approximate cash flows in lieu of explicitly modeling the income statement, balance sheet, and cash flow statement as we do in Stage I. The length of the second stage depends on the strength of the company's economic moat. We forecast this period to last anywhere from one year (for companies with no economic moat) to 10–15 years or more (for wide-moat companies). During this period, cash flows are forecast using four assumptions: an average growth rate for EBI over the period, a normalized investment rate, average return on new invested capital (RONIC), and the number of years until perpetuity, when excess returns cease. The investment rate and return on new invested capital decline until a perpetuity value is calculated. In the case of firms that do not earn their cost of capital, we assume marginal ROICs rise to the firm's cost of capital (usually attributable to less reinvestment), and we may truncate the second stage.

Stage III: Perpetuity
Once a company's marginal ROIC hits its cost of capital, we calculate a continuing value, using a standard perpetuity formula. At perpetuity, we assume that any growth or decline or investment in the business neither creates nor destroys value and that any new investment provides a return in line with estimated WACC.

Because a dollar earned today is worth more than a dollar earned tomorrow, we discount our projections of cash flows in stages I, II, and III to arrive at a total present value of expected future cash flows. Because we are modeling free cash flow to the firm—representing cash available to provide a return to all capital providers—we discount future cash flows using the WACC, which is a weighted average of the costs of equity, debt, and preferred stock (and any other funding sources), using expected future proportionate long-term, market-value weights.

Uncertainty around that fair value estimate
Morningstar's Uncertainty Rating captures a range of likely potential intrinsic values for a company and uses it to assign the margin of safety required before investing, which in turn explicitly drives our stock star rating system. The Uncertainty Rating represents the analysts' ability to bound the estimated value of the shares in a company around the Fair Value Estimate, based on the characteristics of the business underlying the stock, including operating and financial leverage, sales sensitivity to the overall economy, product concentration, pricing power, and other company-specific factors.

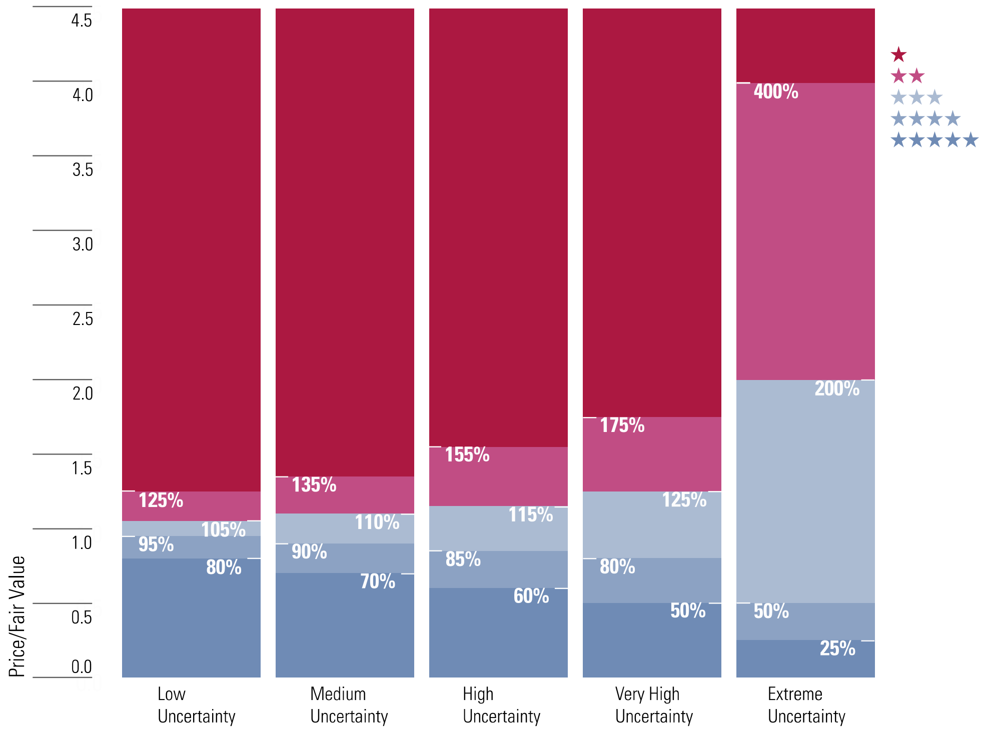
Analysts consider at least two scenarios in addition to their base case: a bull case and a bear case. Assumptions are chosen such that the analyst believes there is a 25% probability that the company will perform better than the bull case, and a 25% probability that the company will perform worse than the bear case. The distance between the bull and bear cases is an important indicator of the uncertainty underlying the fair value estimate.

Our recommended margin of safety widens as our uncertainty of the estimated value of the equity increases. The more uncertain we are about the estimated value of the equity, the greater the discount we require relative to our estimate of the value of the firm before we would recommend the purchase of the shares. In addition, the uncertainty rating provides guidance in portfolio construction based on risk tolerance.

Our uncertainty ratings for our qualitative analysis are low, medium, high, very high, and extreme.

- Low–margin of safety for 5-star rating is a 20% discount and for 1-star rating is 25% premium.
- Medium–margin of safety for 5-star rating is a 30% discount and for 1-star rating is 35% premium.
- High–margin of safety for 5-star rating is a 40% discount and for 1-star rating is 55% premium.
- Very High–margin of safety for 5-star rating is a 50% discount and for 1-star rating is 75% premium.
- Extreme– margin of safety for 5-star rating is a 75% discount and for 1-star rating is 300% premium.

Morningstar Equity Research Star Rating Methodology



Market Price
The market prices used in this analysis and noted in the report come from exchange on which the stock is listed which we believe is a reliable source.

For more details about our methodology, please go to https://shareholders.morningstar.com.

Morningstar Star Rating for Stocks
Once we determine the fair value estimate of a stock, we compare it with the stock's current market price on a daily basis, and the star rating is automatically re-calculated at the market close on every day the market on which the stock is listed is open. Our analysts keep close tabs on the companies they follow, and, based on thorough and ongoing analysis, raise or lower their fair value estimates as warranted.

Please note, there is no predefined distribution of stars. That is, the percentage of stocks that earn 5 stars can fluctuate daily, so the star ratings, in the aggregate, can serve as a gauge of the broader market's valuation. When there are many 5-star stocks, the stock market as a whole is more undervalued, in our opinion, than when very few companies garner our highest rating.

We expect that if our base-case assumptions are true the market price will converge on our fair value estimate over time, generally within three years (although it is impossible to predict the exact time frame in which market prices may adjust).

Our star ratings are guideposts to a broad audience and individuals must consider their own specific investment goals, risk tolerance, tax situation, time horizon, income needs, and complete investment portfolio, among other factors.

The Morningstar Star Ratings for stocks are defined below:

★★★★★ We believe appreciation beyond a fair risk-adjusted return is highly likely over a multiyear time frame. Scenario analysis developed by our analysts indicates that the current market price represents an excessively pessimistic outlook, limiting downside risk and maximizing upside potential.

★★★★ We believe appreciation beyond a fair risk-adjusted return is likely.

★★★ Indicates our belief that investors are likely to receive a fair risk-adjusted return (approximately cost of equity).

★★ We believe investors are likely to receive a less than fair risk-adjusted return.

★ Indicates a high probability of undesirable risk-adjusted returns from the current market price over a multiyear time frame, based on our analysis. Scenario analysis by our analysts indicates that the market is pricing in an excessively optimistic outlook, limiting upside potential and leaving the investor exposed to Capital loss.

Risk Warning
Please note that investments in securities are subject to market and other risks and there is no assurance or guarantee that the intended investment objectives will be achieved. Past performance of a security may or may not be sustained in future and is no indication of future performance. A security investment return and an investor's principal value will fluctuate so that, when redeemed, an investor's shares may be worth more or less than their original cost. A security's current investment performance may be lower or higher than the investment performance noted within the report. Morningstar's Uncertainty Rating serves as a useful data point with respect to sensitivity analysis of the assumptions used in our determining a fair value price.

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