sciens

Diamond Management BV

Fancy Coloured Diamonds

An Emerging Asset Class

OVERVIEW

Deemed an investor's best friend by *Forbes* this year (Forbes), fancy coloured diamonds are currently proving their worth as an emerging asset class. Considered a timeless statement of beauty, fancy coloured diamonds are one of the rarest kinds of natural resources in the world. Only one in every ten thousand carats of diamonds mined will be fancy coloured [Gemological Institute of America ("GIA")]. Their range includes Red, Purple, Blue, Pink, Green, Orange and Yellow.

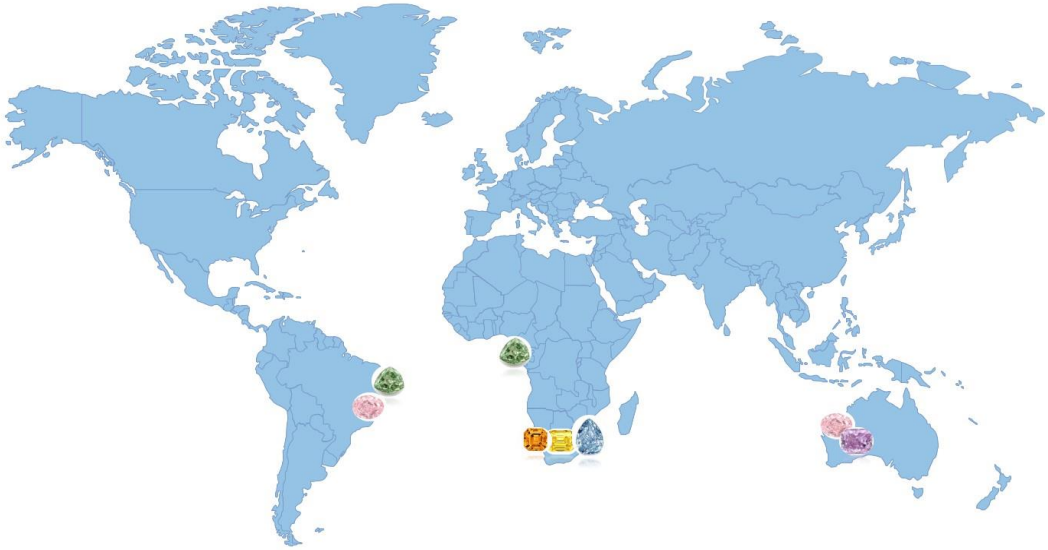
The supply constraint for these beautiful stones enhances their allure even further with a number of appealing attributes such as uncorrelated returns, consistent and long term, value growth, and downside risk protection.

FORMATION AND PRODUCTION

Geologists place the formation of most natural diamonds as being between 4.6 billion and 500 million years ago (King) when crystals of pure carbon formed under extreme temperature and pressure about 150 km under the earth's surface. During the formation process, a non-carbon element (such as boron, nitrogen or hydrogen) would occasionally become trapped, adding colour to the diamonds.

Unlike colourless diamonds, which are found across the globe and cannot be associated with a specific location (unless marked), a fancy coloured diamond can be associated with the specific region where it was formed. For example, Australia's Argyle Mine produces more than 90% of the world's pink diamonds (Rio Tinto).

Figure 1: Fancy Coloured Diamond Locations



Source: Gemological Institute of America, Sciens Analysis.

Before the 19th century, diamonds were mostly found along the deltas of certain rivers in Southern India. The first recorded diamond mining project began in South Africa circa 1870 with the Kimberley Mine (Balfour).

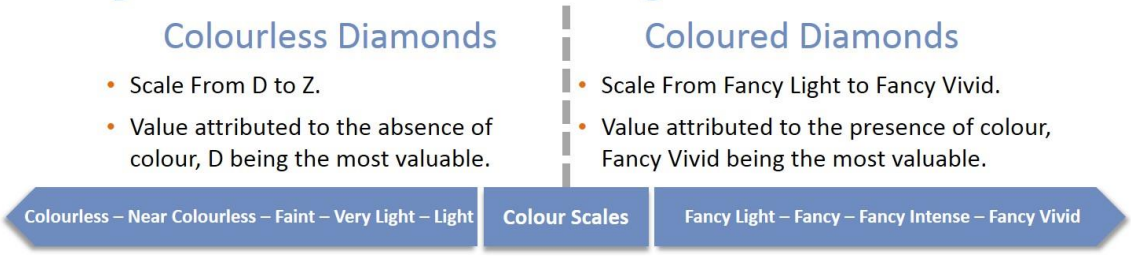
According to *Bain's 2014 Global Diamond Report*, there are five major producers of rough diamonds - ALROSA, De Beers, Rio Tinto, Dominion Diamond and Petra Diamonds - that in 2013 accounted for 70% of total global production, which amounted to approximately 130 million carats or 26 metric tons (Bain & Co.). Russia and Botswana were the largest producers, mining 29% and 18% of global output respectively (Kimberly Process Certification Scheme).

Mined diamonds are divided into two categories: industrial grade and gem grade, with the 2013 global output broken down into approximately 42% to 50% industrial and 50% to 58% gem. After accounting for waste from cutting and polishing, only 15% to 19% of the global output makes its way to become jewellery grade (Bain & Co.).

VALUE

Every diamond is unique. Scarcity has traditionally been the main driver of colourless and fancy coloured diamond prices. However, over time, more sophisticated ways to assign value to diamonds have emerged. Today, one of the most widely used methods for valuing diamonds relies on the concept of the four Cs, introduced by the Gemological Institute of America. This methodology assigns value based on a diamond's specific Colour, Clarity, Carat and Cut. Each C has a different scale and may have a different impact on a colourless or a fancy coloured diamond as shown in Figure 2.

Figure 2: Differences in Valuing Diamonds – Colour



Source: Gemological Institute of America

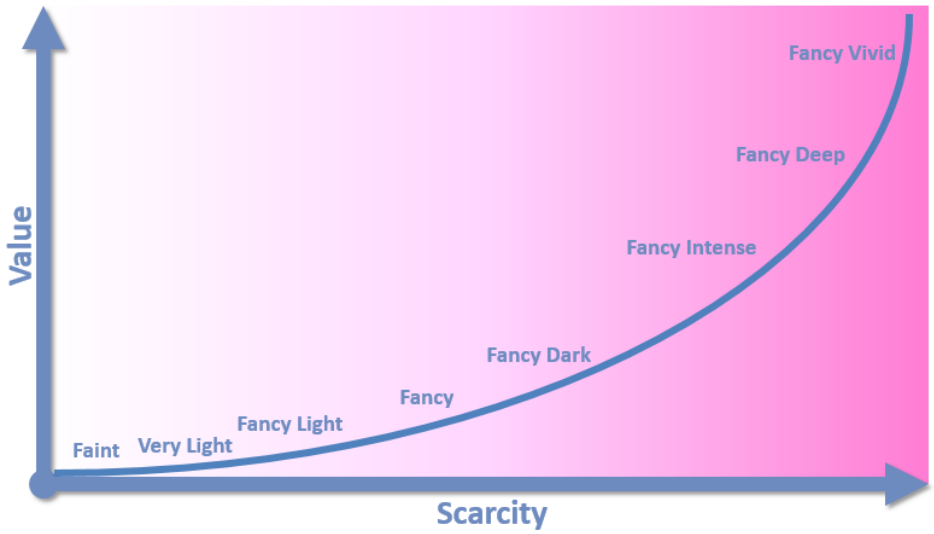
However, the role of scarcity in the 4Cs methodology still has an important bearing when valuing fancy coloured diamonds. According to *WWW International Diamond Consultants,* an industry consultant, in order to have a reliable price gauge for a particular type of stone, evidence of at least 5,000 carats worth of stones with similar attributes traded at a particular price is needed (WWW International Diamond Consultants). However, this premise creates an issue when valuing fancy coloured diamonds which are so rare that the total amount of diamonds in circulation globally may not even reach one thousand carats.

Other ways of developing a more precise understanding of the value of these extremely scarce gems is to track the behaviour of auctions and retail sales. In addition, there are a handful of

experts in the world with sufficient academic credentials and market expertise to render a significant opinion on the value of a fancy coloured diamond.

Figure 3 shows the relationship between value and scarcity along the diamond colour scale, taking pink diamonds as an example.

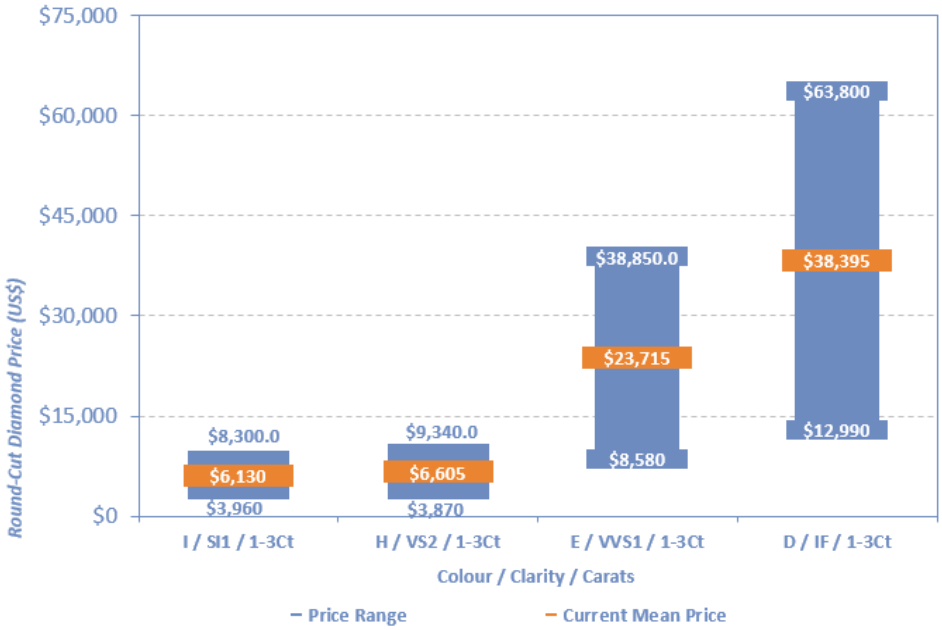
Figure 3: Colour Scale by Scarcity and Value



Source: Gemological Institute of America, Sciens Analysis

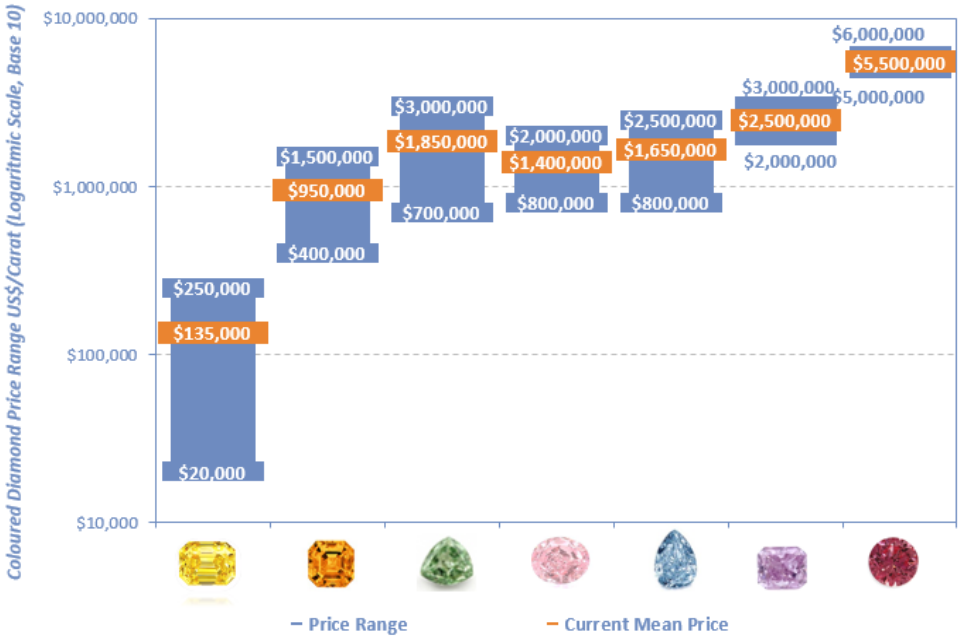
Figures 4 and 5 summarise the impact of the 4Cs and the role of scarcity for colourless and fancy coloured diamond values through a series of current and estimated price ranges.

Figure 4: Round-Cut Colourless Diamond Price Ranges by Colour, Clarity, and Carats (US$)



Source: Bloomberg, Sciens Analysis

Figure 5: Fancy Intense & Vivid Coloured Diamond Estimated Price Range by Colour (US$/Carat)



Source: Sciens Analysis

FANCY COLOURED DIAMONDS AS AN ASSET CLASS

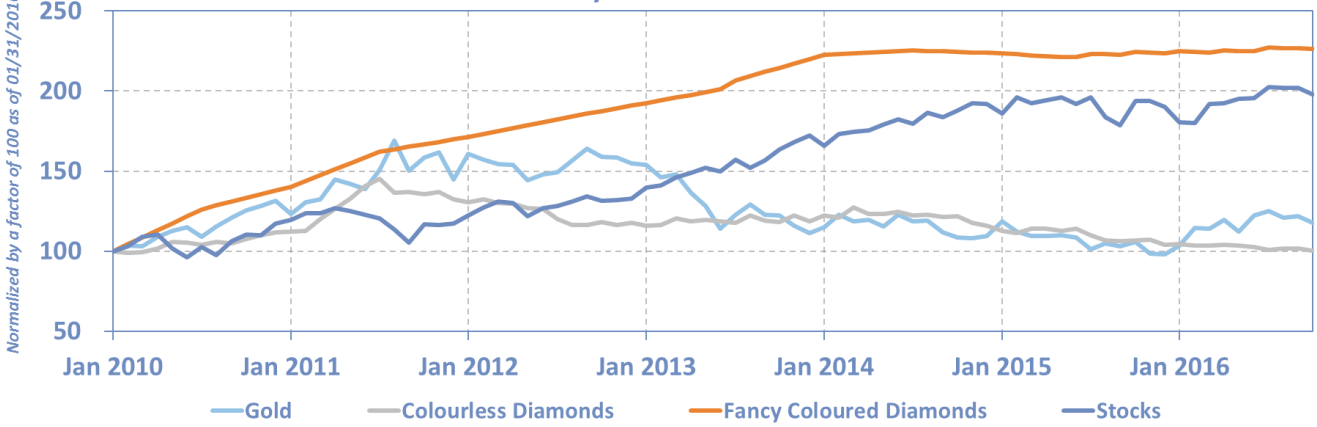
Most investors will naturally think of gold as the quintessential inflation hedge/real asset investment target. However, gold prices have underperformed in the aftermath of the global financial crisis. This so called "new normal" is distinguished by high market volatility, near zero interest rates, low inflation and limited global growth. Amid this new scenario, investors are beginning to move into asset classes such as fancy coloured diamonds to diversify their portfolios in search of uncorrelated returns with an attractive risk profile.

The Sciens' Real Assets Research Team conducted an analysis on the performance of stocks, gold, colourless and fancy coloured diamonds. Results show that fancy coloured diamonds outperformed every asset class with significant value growth[1], lowest volatility[2], broad downside risk protection[3] and the least market-correlated returns[4].

[1] Value growth was calculated as the compounded annual growth rate of each asset's monthly returns during the period ranging from January 2010 to April 2015.
[2] Volatility was calculated as the standard deviation of each asset's monthly returns during the period ranging from January 2010 to April 2015.
[3] Downside risk protection was calculated as the downside deviation of each asset's monthly returns during the period ranging from January 2010 to April 2015.
[4] Market correlation was calculated as the beta coefficient of each asset's monthly returns relative to the S&P 500 monthly returns during the period ranging from January 2010 to April 2015.

Figure 6 shows the performance of each asset class.

Figure 6: Five-Year Performance Chart
January 2010 - October 2016



Source: Bloomberg, The Fancy Color Research Foundation, Rare Colored Diamonds Price Index, Sciens Analysis. Stocks, Gold, Colourless Diamonds, and Coloured Diamonds are represented by S&P 500 Index, Gold Spot Index, Diamond Prices Overall Index, and Pink Diamond Index respectively.

Figure 7 is a summary of the results of each performance measure used in the analysis.

Figure 7: Performance Results

Annual Value Growth (CAGR)

Stocks	Gold	Colourless Diamonds	Fancy Coloured Diamonds
13.25%	1.72%	2.46%	16.10%

Volatility (Standard Deviation)

Stocks	Gold	Colourless Diamonds	Fancy Coloured Diamonds
3.71%	5.28%	2.62%	1.16%

Downside Risk (Downside Deviation)

Stocks	Gold	Colourless Diamonds	Fancy Coloured Diamonds
2.38%	3.06%	1.37%	0.09%

Market Correlation (Beta)

Stocks	Gold	Colourless Diamonds	Fancy Coloured Diamonds
1.00	0.11	-0.09	0.00

Performance Colour Key

Relative Underperfomance		Relative Overperformance	

Source: Bloomberg, The Fancy Color Research Foundation, Rare Colored Diamonds Price Index, Sciens Analysis. Stocks, Gold, Colourless Diamonds, and Coloured Diamonds are represented by S&P 500 Index, Gold Spot Index, Diamond Prices Overall Index, and Pink Diamond Index respectively.

When analysing the performance of real assets, it is important to address two issues. First, to distinguish between the actual real asset and the financial securities tied to the prices of such

assets and, second, to consider real assets' differentiators such as their high barriers to entry and their ability to hold intrinsic value.

Gold is a perfect example. Still regarded by many investors as one of the safest asset classes when acquired in bullion, it may be argued that currently the price of gold is more influenced by its link to financial instruments (gold equity stocks) than by the actual value of the real asset (gold bullion), making it less attractive as a real asset investment. Fancy coloured diamond scarcity makes it very unlikely for these gems to be used as a proxy for a financial security, thus ensuring that they will continue to benefit from the investment fundamentals that real asset investors seek.

Figure 8 summaries the performance summary of the four asset classes in question.

Figure 8: Performance Summary

	Long-Term Value Growth	Low Volatility	Downside Risk Protection	Uncorrelated Returns	Real Asset Differentiatiors[1]
Fancy Coloured Diamonds	✓	✓	✓	✓	✓
Gold (Bullion)	✗	✗	✗	✓	✓
Colourless Diamonds	✗	✓	✗	✓	✓
Gold (Stocks)	✗	✗	✗	✓	✗
Stocks	✓	✗	✗	✗	✗

[1]High barriers to entry, intrinsic value holding.
Source: Sciens Analysis

For centuries, the extraordinary scarcity and unparalleled elegance of fancy coloured diamonds has made them the ultimate object of desire. Mining advances in the twentieth century have brought them forward as the definition of luxury. In recent years, the price behaviour of these diamonds has shown that their brilliance does not only lie in their beauty but also in their performance as an emerging and investable asset class. Fancy coloured diamonds are well placed to be a differentiated investment asset given the relatively fixed supply, increasing demand and their independence from economic factors globally.

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