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Exploring Markets – Diamonds

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Exploring Markets – Diamonds

Daniel Weber

ABSTRACT:

„Exploring Markets“ is a paper series discussing niche markets with interesting characteristics. The paper on hand focuses on the market for diamonds. The paper discusses specific characteristics of supply and demand such as the supply chain from mining to retail, the dismantling of the diamond cartel, qualities of diamonds, the Kimberley Process Certification as an approach to ensure ethical sourcing, the role of advertisement in creating demand and the potential disruption of the diamond industry through lab-grown diamonds.

KEYWORDS:

Market Study, Diamonds

JEL classification: Z19

AUTHOR



Prof. Dr. Daniel Weber is professor of business administration at the Hamburg campus of the IU International University of Applied Science. His research interests cover fields like innovation, niche markets and, in his view, interesting market mechanisms.

Introduction

Natural diamonds are formed deep in the earth's mantle, dissolving minerals through carbon-containing fluids under high pressure and temperatures. They are brought to the surface through episodic volcanic emplacement and can be found mainly in rare igneous rocks called kimberlites.

Diamonds have been embraced across numerous applications owing to their unique physical attributes. They possess unparalleled thermal conductivity and hardness. Their optical transparency spans from the far infrared to the deep ultraviolet spectrum, exhibiting significant optical dispersion. Additionally, diamonds exhibit high electrical resistance and remain chemically inert, resisting reactions with most corrosive substances, while boasting excellent biological compatibility (Chen & Zhang, 2013, p.1). However, by far their most common use is in jewelry. Historians date back the first trade of diamonds back to the 4th century BC in India where diamonds were gathered in rivers and became status symbols of the upper class (GIA, 2024a). Generally, diamonds have maintained their status as valuable gemstones due to their rarity, durability, and cultural significance. However, fluctuations in the diamond market do occur based on factors like changes in consumer buying patterns, shifts in global economic conditions, and developments in diamond mining and production. The paper on hand will discuss these factors, starting with the structure of diamond supply, then it will highlight different drivers of demand and finally give an outlook on challenges for the industry.

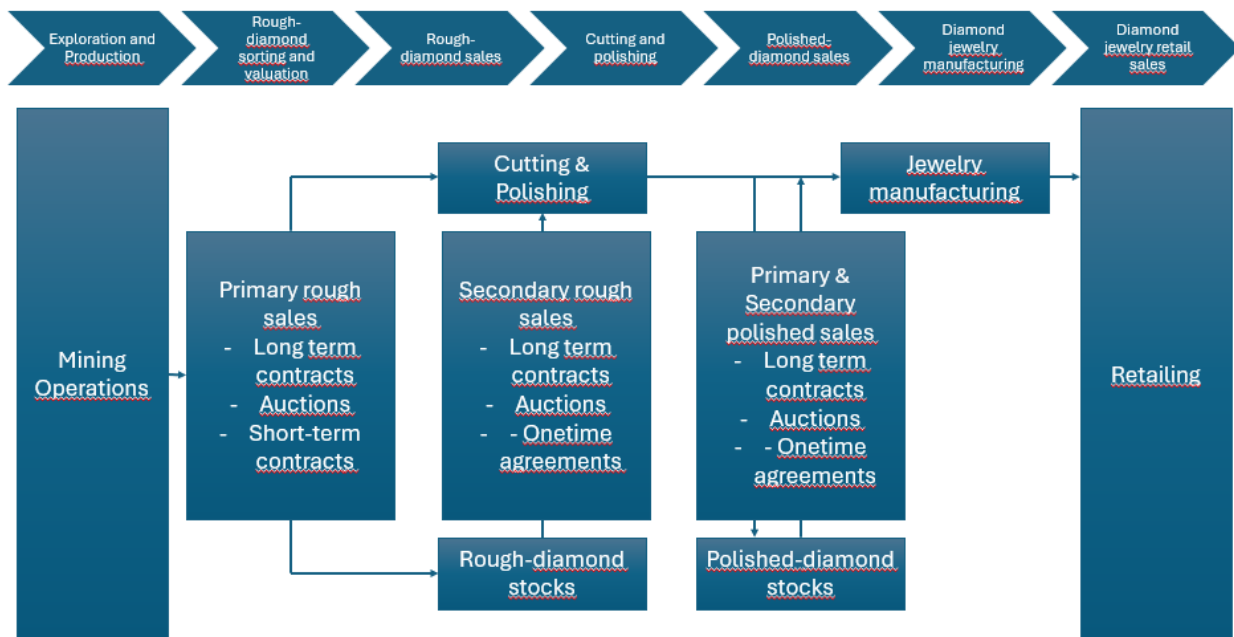
Supply

THE SUPPLY CHAIN

The downstream of the diamond market supply chain involves various stages from the point where rough diamonds are mined to the point where polished diamonds reach consumers. After **rough diamonds are mined**, they go through **sorting and valuation** processes. This involves categorizing the diamonds based on various criteria such as size, color, clarity, and shape. The valuation helps determine the market value of the rough diamonds. Once the rough diamonds are sorted and valued, they are sent to **diamond cutting and polishing** facilities. After diamonds are cut and polished, they undergo **grading and certification** by gemological laboratories such as the Gemological Institute of America (GIA) or the International Gemological Institute (IGI). These laboratories evaluate the quality of the diamonds based on the 4Cs (cut, color, clarity, and carat weight) and issue certificates that provide detailed information about the diamonds' characteristics. Polished diamonds are then sold in the wholesale diamond market to diamond dealers, manufacturers, and jewelry companies. The diamond industry operates through established trading centers, at these trading centers, such as the Diamond Trading Company (DTC) in Botswana and the Antwerp Diamond Bourse in Belgium, **wholesale diamond traders** buy diamonds in bulk quantities and supply them to retailers, jewelry designers, and other businesses in the diamond industry. The final stage of the downstream diamond supply chain is the **retail market**, where polished diamonds are sold to consumers through various channels

such as jewelry stores, online retailers, and auction houses. Figure 1 illustrates the supply chain of the diamond industry from upstream mining operations to downstream retailing.

Figure 1: Diamond industry supply chain

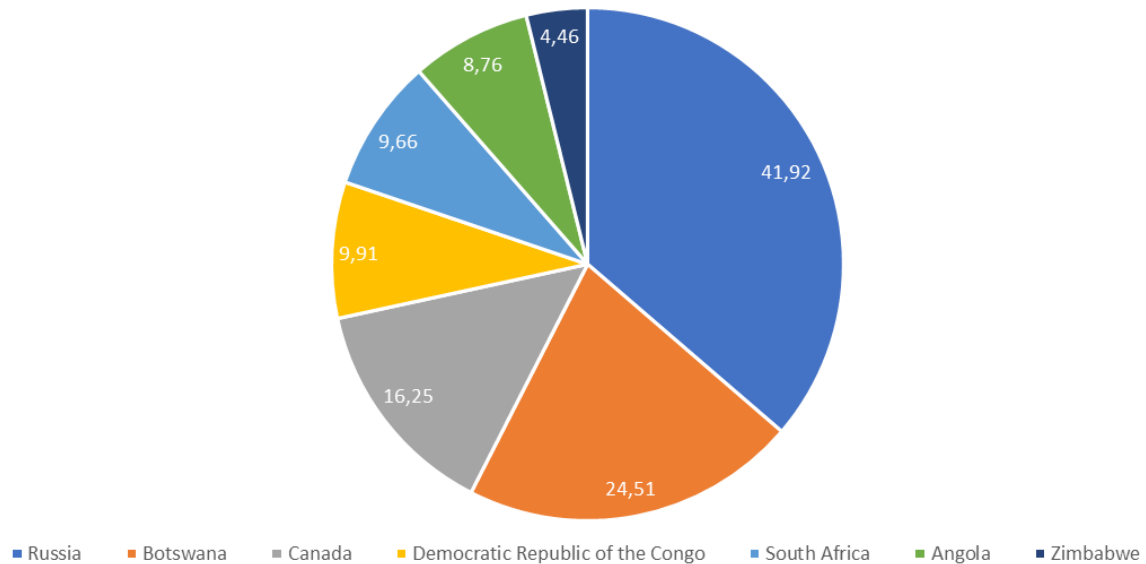


Source: Bain & Company “The Global Diamond Report 2013: Journey through the Value Chain”

THE MINING OF ROUGH DIAMONDS

Diamonds are comparatively rare minerals that are distributed mostly in Russia, Canada, and Botswana, and to a smaller degree in other African countries like the Democratic Republic of Kongo, South Africa, Angola, and Zimbabwe (figure 2 gives an overview of the global diamond production by country). In 2022 there has been a global production volume of 120 million carat with a range of 107 million in 2020 to 176 million in 2006 within the last twenty years (Kimberley Process, 2023).

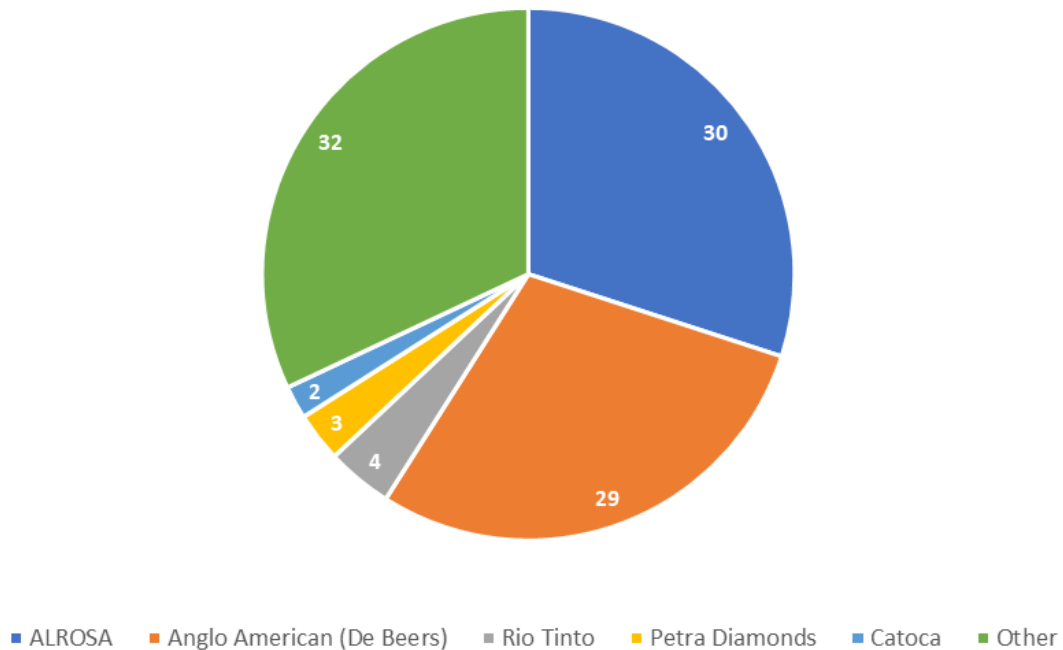
The political and economic effects of mining diamonds (especially in Africa) is often discussed in the context of the “resource curse” hypothesis. The hypothesis was first proposed by Richard Auty in his book “Sustaining Development in Mineral Economies” and describes the counterintuitive observation, that a richness of rare natural assets can distort the economic growth of a country (Auty, 1993, pp.1-2). In the case of diamonds, mining was often blamed for civil unrest and domestic violence. However, there is evidence that changes in business practice (the most influential is the Kimberley Process, which will be discussed later) and in functioning institutions led to positive effects of diamond exports on economic growth in exporting countries (Karli, 2019, p. 5).

Figure 2: Top 7 diamond mining countries in 2022 (in million carats)

Source: data from Kimberley Process Annual Global Summary 2022

The supply of diamonds is managed actively through the supply chain to regulate the quantity and quality of diamonds entering the market. This includes adjusting mining volumes based on market conditions, control of rough diamond imports and exports, demand forecasts, and inventory levels. A recent example is a call for a two-month diamond import halt of rough diamonds by India's diamond trade bodies to "protect the value of assets and increase consumer confidence" (Reuters, 2023). The diamond industry is dominated by a few companies with significant influence through the supply chain (see figure 3). This level of concentration can be explained by the historically influential role of DeBeers who significantly controlled the diamond industry for over 100 years building the oldest and one of the most successful cartels in the world (Levenstein & Suslow, 2006, p.12). Until the 1990's De Beers had a market share of about 80%, their monopoly eroded when the Russian Federation began selling diamonds outside of DeBeers, leading to the rise of the current market leader ALROSA, additionally Rio Tinto became an independent competitor by terminating the supply relationship with DeBeers for the Australian Argyle mine in 1996 and became the third biggest competitor in the diamond market (Zimnisky, 2019).

Figure 3: Market Share (in %) leading diamond producers 2022



Source: data from company reports 2022

SYNTHETIC DIAMONDS

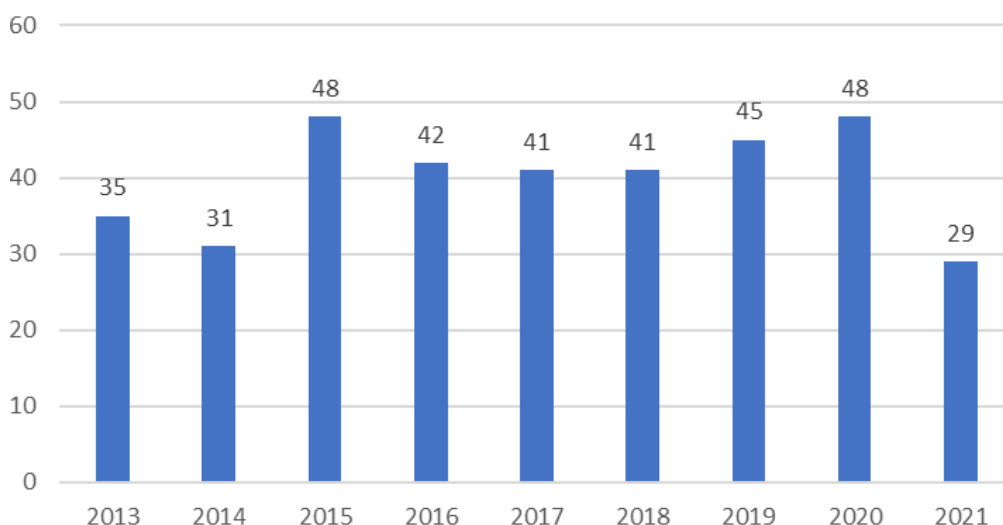
Synthetic diamonds, also known as lab-grown or cultured diamonds, are produced through two primary methods: high-pressure high-temperature (HPHT) and chemical vapor deposition (CVD). Both methods allow to produce diamonds that are chemically and structurally identical to natural diamonds, making them indistinguishable without specialized equipment (Martineau, Lawson, Taylor, Quinn, Evans and Crowder, 2004, p.2). At their introduction in the 1940's, synthetic diamonds were primarily used for industrial purposes due to their low quality. With sinking costs and better quality nowadays, synthetic diamonds are seen as a serious threat for disrupting the natural diamond market as they can be sold at prices about 35% lower than natural diamonds and with the advantage of being conflict-free (Rarick and Angriawan, 2017, pp. 93-94). Experts warn about parallels to similar developments in the pearl industry, which was significantly disrupted by the introduction of synthetic pearls, and advocate for easily detectable markers introduced during the growing process (Sherman, 2016). For diamond producers the increasing popularity of synthetic diamonds requires a shift to a more demand-oriented strategy. DeBeers for example started to brand its diamonds and increase its vertical integration, creating FOREVERMARK branded diamonds sold exclusively through authorized jewelers (Rarick and Angriawan, 2017, p.94). DeBeers also briefly tried to establish its own brand of lab-grown diamonds for jewelry but stopped when cannibalization effects led to plunging prices for engagement rings with natural diamonds (Biesheuvel, 2023).

INVENTORY AND RETAIL

Historically, the diamond industry used a strict stockpiling strategy to control the supply of rough diamonds and uphold prices. Even more than in other industries price stability is seen as one of the corner stones of the industries success and to a large degree valued over short term profit. A strategy that goes back to Cecil Rhodes (founder of DeBeers) who established that the number of diamonds brought to the market in any given year should be approximately equal to the number of wedding engagements occurring in that year (Bergenstock & Maskulka, 2001, p.39). However, from 2004 to 2004 DeBeers liquidated its strategic diamond stockpile (amounting to \$5 billion) and started to operate with smaller inventory (Ziminsky, 2019). According to an analysis by Bain & Company the upstream inventory balance in the diamond industry fluctuates between 29 and 48 million carats in recent years (see figure 4).

In terms of inventory at the retail level, Jewelers tend to adopt a more conservative approach, especially during economic downturns. The rise of online trading has enabled retailers to reduce their stock levels and expect quicker delivery times from their suppliers. Manufacturers face the challenge of contractual obligations to buy diamonds for which they don't have demand (Krawitz, 2023). The most widely used sales channel for rough diamonds, especially for the big producers, are long-term contracts, with the example of DeBeers selling 90% of their rough diamonds via term contracts (DeBeers Group, 2024). However, in recent years auctions gained importance as an important sales channel for smaller producers, to test market pricing and to sell unique stones (Bain & Company, 2013). Although auction sales remain a minority in the rough diamond market, they now wield considerable influence over prices, and it is argued that this has caused considerable price volatility at the producer levels (Shor, 2014, p.266).

Figure 4: Accumulated inventory balance upstream (million carats)



Source: data from Bain & Company “the global diamond industry 2021-22”

Demand

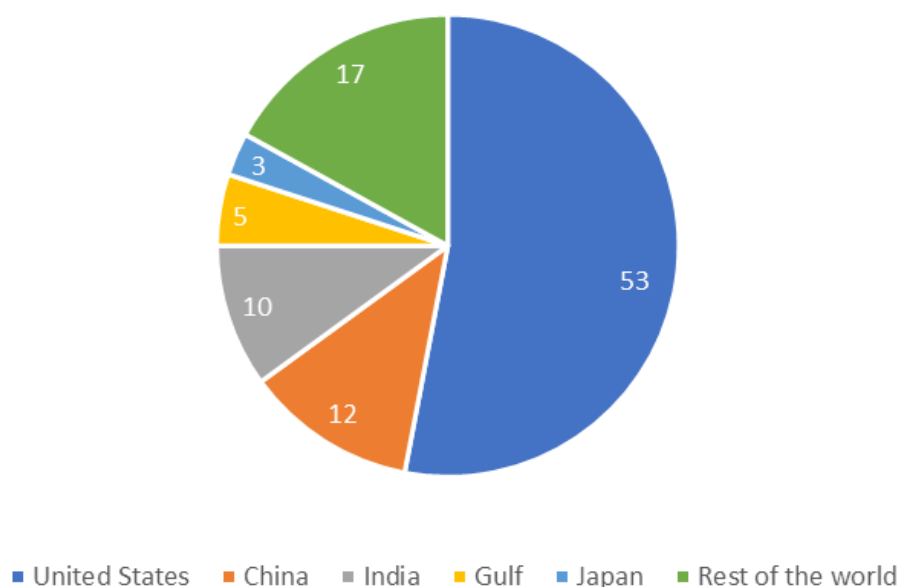
MARKET SEGMENTS

The primary demand for diamonds comes from the **jewelry industry**, which uses them in various forms of adornment such as rings, necklaces, bracelets, and earrings. The jewelry segment accounted for the dominant revenue share of 98% in 2022 (Grand View Research, 2022). The demand for diamond jewelry is influenced by fashion trends, cultural preferences, and consumer purchasing power. The leading diamond jewelry consuming countries are the USA, China and India, whose share in the world consumption of global polished diamonds is about 75%, while the USA accounts for about 53% of the global consumption (see figure 5).

Diamonds also have various **industrial applications** due to their hardness, thermal conductivity, and electrical insulating properties. They are used in cutting, grinding, drilling, and polishing tools for industries such as mining, construction, manufacturing, and electronics. The industrial segment is comparatively small, however, the rapid expansion of construction activities in developing countries is predicted to benefit the segment's growth, which will especially increase the demand for synthetic diamonds (Grand View Research, 2022).

While not as significant as demand for jewelry, diamonds are also sought after as **investment assets**. Some investors view diamonds as a store of value and a hedge against inflation. However, the investment demand for diamonds is relatively small compared to other assets like gold or real estate and is not actively marketed by the leading diamond suppliers.

Figure 5: Share (in %) of global polished diamond demand in 2022 by region



Source: data from DeBeers "The Diamond Insight Report 2023"

Global demand for jewelry as a luxury good is strongly affected by the macroeconomic environment which was challenging in recent years due to surging inflation, elevated interest rates and rising costs of living, especially in the US (DeBeers, 2023, p. 6).

THE 5'CS OF DIAMONDS

Since the early 1940's the quality of diamonds is described by the four c's which determine their physical qualities: **carat (weight)**, **cut**, **clarity** and **color** (Gibertson, 2016). Since the early 2000's consumer's demand for diamonds that are not associated with funding conflicts or human rights abuses established the certification of **conflict-free** diamonds, thus unofficially creating the "fifth c" of diamond qualities.

A **Carat** is the standardized unit of measurement for the physical weight of diamonds. One carat equals 1/5 gram. Of the 4Cs carat weight is the strongest driver of value, increasing nonlinear at certain "keyweights" such as 0,50 ct, 0,75 ct, and 1,00 ct. Grading experts recommend to correlate the weight of a diamond with its "physical spread" to take into account its level of vertical geometry and size appearance (Pricescope, 2024).

The **cut** of a diamond describes the manufacturing process of turning rough diamonds into faceted gems. The cut of a diamond holds significant because it determines how it reflects the light. The Gemological Institute of America (GIA) grades diamond cuts on a scale from Excellent to Poor based on various factors including brightness, fire, scintillation, durability, weight ratio, polish, and symmetry (GIA, 2024b). In terms of driving demand, the cut seems to have the lowest impact on value of all the physical qualities of diamonds (Mamonov & Triantoro, 2018).

The **color** of a diamond ranges from colorless to yellow or brown, with colorless diamonds being the most valuable. However, there are also diamonds with rare and fancy colors like pink, blue, and green, which can be highly valuable if they are vivid and intense. Diamonds undergo color grading by comparing them to stones of established color under controlled lighting and meticulous viewing conditions (GIA, 2024c).

Clarity refers to the presence of internal characteristics called inclusions and surface irregularities called blemishes. Diamonds with fewer and less visible inclusions and blemishes are considered to have higher clarity grades and are more valuable. The clarity of a diamond is assessed under magnification using a standardized grading scale. Clarity is the most subjective physical quality of a diamond, thus providing a challenge for inter- and intra-laboratory grading consistency (Cowing, 2014).

With the start of the 2000's activist groups called for action against "blood diamonds", referring to diamond trade that was funding wars and civil conflicts, which led to a complex certification system called the Kimberley Process which aims at enabling consumers to identify **conflict-free** diamonds that are ethically sourced. The Kimberley Process has achieved nearly universal compliance globally, as participants in the Kimberley Process represent, by their own account, approximately 99.8 percent of the rough diamond production worldwide (Kimberley Process, 2024). The Scheme brings transparency to the international diamond trade by enforcing warranties that the diamonds have been purchased by legitimate sources along the supply chain. However, the program has also faced criticism for making it challenging for small scale miners

to engage in the industry and to intensify the efforts required for exporting through official channels, favoring the already established big suppliers in the diamond industry (Le Billon & Spiegel, 2022).

Empirical evidence suggests, that although diamond prices are strongly influenced by a diamonds physical property there is still a significant degree of subjectivity creating a price dispersion for diamonds. Consequently, even sophisticated empirical models struggle to make accurate price forecasts based on a diamond's observable qualities (Mamonov & Triantoro, 2018).

THE ROLE OF ADVERTISING

In 1938, De Beers and their former agency, N.W. Ayer (replaced by J. Walter Thompson in 1996), initiated an advertising campaign aimed at encouraging the American public to invest in diamonds to counter a significant downward trend in sales due to the great depression. Men were urged to perceive diamonds as tangible representations of love and commitment, while women were conveyed the idea that a diamond ring was essential for engagement. The collaboration between De Beers and N.W. Ayer culminated in the famous slogan “a diamond is forever” coined by the copywriter Frances Gerety in 1947 and named slogan of the century by Advertising Age magazine (Advertising Age, 1999). To this day diamonds are often associated with significant life events such as engagements, weddings, anniversaries, and other special occasions. Advertising campaigns leverage these emotional connections by portraying diamonds as symbols of love, commitment, celebration, and success, thereby reinforcing their cultural significance, and encouraging consumers to incorporate diamonds into their own memorable moments (Francis-Tan & Mialon, 2015, p. 1919). De Beers and N.W. Ayers established many successful marketing strategies especially in cooperation with the film industry in Hollywood. They created the blueprint for product placement by scripting scenes in movies to integrate diamonds into romantic relationships and by providing diamonds to movie stars as symbols of enduring love (Epstein, 1982). DeBeers marketing efforts had significant cultural implications: In the late 30`s, only 10% of engagement rings contained diamonds, by the end of the 20th century, 80% did (Cawley, 2014).

DIAMONDS AS A FINANCIAL INVESTMENT

The resale of diamonds presents a notably complex endeavor due to the multifaceted nature of variables influencing their valuation making it less attractive as a financial investment. The accurate assessment of a diamond's worth demands specialized expertise, and notwithstanding the presence of a certificate, ascertaining its current market value remains challenging. Additionally, the diamond industry has a troubled history regarding the sales of diamonds as an investment commodity. The most significant event was the late 1970s diamond investment crisis in Israel. Diamonds were being heavily promoted as an investment vehicle, leading to inflated prices driven by speculative trading. This overvaluation created a bubble in the diamond market, with prices far exceeding their intrinsic value. Speculators flooded the market, driving up prices

artificially. This speculative activity contributed to the unsustainable growth of the diamond market and exacerbated the crisis when the bubble eventually burst. Around the same time the “investment diamonds scheme” was developed and led to similar results. The scheme involved marketing diamonds as a store of value that would appreciate over time, offering investors the potential for significant returns. Diamond dealers and marketers capitalized on the mystique and perceived rarity of diamonds to attract investors, often emphasizing the gemstones' timeless appeal and durability. When the bubble eventually burst, many investors faced significant losses, underscoring the risks associated with investing in diamonds as a speculative asset (for this paragraph see Bernstein, 1992, p. 131).

A study of Potrykus (2022) showed that price bubbles occurred in the diamond market in relation to several external shocks, such as the financial crisis of 2008, the European debt crisis and the Russian invasion of Ukraine, hence calling into question if investments in diamonds are sensible for portfolio diversification and hedging against speculative bubbles (Potrykus, 2022, p.9).

Conclusion and Outlook

The paper on hand aimed at explaining the basic mechanisms and economics of the current diamond market, focusing on the main drivers and institutions that currently influence supply and demand. However, the diamond industry faces several challenges in the coming years, that might change the market significantly.

There's growing pressure on the diamond industry to address **changing consumer preferences**, especially around environmental and social sustainability issues, including concerns over diamond mining's impact on ecosystems, water usage, carbon emissions, and indigenous communities. Additionally, Millennials and Gen Z consumers may prioritize experiences over material possessions, impacting the demand for luxury goods like diamonds.

The rise of **e-commerce** and digital platforms already has transformed the retail landscape, also challenging traditional brick-and-mortar diamond retailers. Companies in the diamond industry must adapt to digital trends to remain competitive.

Synthetic diamonds present a significant challenge to the natural diamond market. They offer a more sustainable and more affordable alternative, appealing to environmentally conscious consumers and those seeking to avoid the ethical concerns associated with traditional mining. Sharply falling wholesale prices of lab-grown diamonds will decrease customers willingness to pay for natural diamonds unless the industry succeeds in establishing a clear product and brand differentiation in customer perception.

Finally, **external shocks** like international crisis, economic volatility and fluctuations in currency exchange rates can impact consumer purchasing power and demand for luxury items like diamonds. Decreasing monopolistic control of supply and a more contestable market will also more likely lead to more price volatility, which could potentially undermine consumer

confidence in the market, as they may perceive decreasing prices as a sign of diminishing value or quality.

Bibliography:

Advertising Age (1999). *Advertising Age*.

<https://adage.com/article/special-report-the-advertising-century/ad-age-advertising-century-top-10-slogans/140156>

Auty, R. (1993). *Sustaining Development in Mineral Economies – the Resource Curse Thesis*. Routledge, London 1993.

Bain & Company (2022). The Global Diamond Industry 2021-2022. *Bain & Company Insights*. <https://www.bain.com/insights/a-brilliant-recovery-shapes-up-the-global-diamond-industry-2021-to-22/>

Bain & Company (2013). The Global Diamond Report 2013: Journey through the Value Chain. *Bain & Company Insights*. <https://www.bain.com/insights/global-diamond-report-2013/>

Bergenstock, D.J., Maskulka, J. M., (2001). The De Beers story: are diamonds forever? *Business Horizons*, 44(3), 37-44.

Bernstein, L. (1992). Opting out of the legal system: Extralegal contractual relations in the diamond industry. *Journal of Legal Studies*, 21, 115-157.

Biesheuvel, T. (2023). De Beers ends lab-grown engagement diamonds foray as prices drop. *Bloomberg*. <https://www.bloomberg.com/news/articles/2023-09-13/de-beers-ends-its-foray-into-lab-grown-engagement-diamonds>

Cawley, L., (2014). De Beers myth: Do people spend a month's salary on a diamond engagement ring? *BBC*. <https://www.bbc.com/news/magazine-27371208>

Chen, Y., Zhang, L. (2013). *Polishing of Diamond Materials: Mechanisms, Modeling and Implementation (Engineering Materials and Processes)*. Springer-Verlag, London 2013.

Cowing, D. M. (2014). Objective Diamond Clarity Grading. *The Journal of Gemology* 34(4), 316-332.

De Beers Group (2024). Global Sightholder Sales. *De Beers Group* <https://www.debeersgroup.com/about-us/our-operations/sales>

Epstein, E. J. (1982). Have you ever tried to sell a diamond. *The Atlantic*. <https://www.theatlantic.com/magazine/archive/1982/02/have-you-ever-tried-to-sell-a-diamond/304575/>

Francis-Tan, A., Mialon, H. M. (2015). "A DIAMOND IS FOREVER" and other fairy tales: the relationship between wedding expenses and marriage duration. *Economic Inquiry*, 53 (4), 1919-1930.

GIA (2024a). Diamond History and Lore. *Gemological Institute of America*. <https://www.gia.edu/diamond-history-lore>

GIA (2024b). GIA 4Cs Cut. *Gemological Institute of America*. <https://www.gia.edu/gia-about/4cs-cut>

GIA (2024c). GIA 4Cs Color. *Gemological Institute of America*. <https://www.gia.edu/gia-about/4cs-color>

- Gibertson, A. (2016). Diamond Quality: A Short History of the diamonds cladiam4Cs. *Gemological Institute of America*. <https://www.gia.edu/gia-news-research/diamond-quality-short-history-4Cs>
- Grand View Research (2022). Diamond Market Size, Share & Trends Analysis Report By Type (Natural, Synthetic), By Application (Jewelry & Ornaments, Industrial), By Region (NA, EU, APAC, Central & South America, MEA), And Segment Forecasts, 2023 – 2030. *Grand View Research*. URL: <https://www.grandviewresearch.com/industry-analysis/diamond-market>
- Hamrick, K. (2019). Is Diamond a resource curse for Africa? *Undergraduate Economic Review*, 16 (1), 1-12.
- Kimberley Process (2023). Annual Global Summary: 2022 Production, Imports, Exports and KPC Counts. *Kimberley Process*. https://kimberleyprocesstatistics.org/static/pdfs/public_statistics/2022/2022GlobalSummary.pdf
- Krawitz, A. (2023). Time to tackle the diamond industry's pre-pandemic challenges. *Rapaport*. <https://rapaport.com/analysis/time-to-tackle-the-diamond-industrys-pre-pandemic-challenges/>
- Le Billon, P., Spiegel, S. (2022). Cleaning mineral supply chains? Political economies of exploitation and hidden costs of technical fixes. *Review of International Political Economy*, 29(3), 768-791.
- Levenstein, M., Suslow, V. (2006). What Determines Cartell Success? *Journal of Economic Literature* ,44 (1), 43-96.
- Mamonov, S., Triantoro, T. (2018). Subjectivity of Diamond Prices in Online Retail: Insights from a Data Mining Study. *Journal of Theoretical and Applied Electronic Commerce Research*, 13 (2), 15-28.
- Martineau, P. M., Lawson, S. C., Taylor, A. J., Quinn, S. J., Evans, D. J., Crowder, M.J., (2004). Identification of synthetic diamond grown using chemical vapor deposition (CVD). *Gems & Gemology*, 40 (1), 2-25.
- Pricescope (2024). Diamond Carat Weight: Everything you need to know. *Pricescope*. <https://www.pricescope.com/education/diamond-carat>
- Potrykus, M. (2022). Diamond investments – Is the market free from multiple price bubbles? *International Review of Financial Analysis*, 83, 1-9.
- Rarick, C.A., Angriawan, A. (2017). Innovative disruption: The case of the diamond industry. *Journal of Strategic Innovation and Sustainability*, 12 (2), 91-96.
- Reuters (2023). Indian trade bodies call for two-month halt to rough diamond imports. *Reuters*. <https://www.reuters.com/markets/commodities/indian-trade-bodies-call-two-month-halt-rough-diamond-imports-2023-09-27/DeBeers Warehouse>
- Sherman, A. (2016). Synthetic Diamonds: Opportunity or problem? *Buyers Intelligence Group*. http://www.bigjewelers.com/wp-content/uploads/2016/07/Synthetic-Diamonds_Opportunity-or-Problem-by-Abe-Sherman.pdf
- Shor, R. (2014). Rough Diamond Auctions: Sweeping Changes in Pricing and Distribution. *Gems & Gemology*, 50 (4), 252-267.
- Zimnisky, P. (2019). A Brief History of DeBeers. *Private Homepage*. <https://www.paulzimnisky.com/a-brief-history-of-de-beers>