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THE POWER OF INNOVATION: AN ANALYSIS OF THE JAPANESE BIG 4 MOTORBIKE FIRMS' TECHNOLOGICAL ADVANCEMENTS AND FUTURE PROSPECTS

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Abstract

This paper provides a comprehensive analysis of the oligopoly formed by Suzuki, Kawasaki, Yamaha, and Honda in the motorbike industry. Our study reveals that Honda leads the market as a pioneer, introducing new technologies and releasing new models. The oligopoly controls market pricing by charging similar prices, although slight differentials suggest the presence of pricing discrimination. Furthermore, evidence demonstrates that these four companies engage in cooperative and competitive behaviours to sustain a thriving market.

In conclusion, the oligopoly theory serves as an adequate explanation for the dynamics of global markets, including the motorbike industry. The presence of a few dominant firms in the Japanese market raises questions regarding the prevalence of collusion or competition as the prevailing dynamic. This paper seeks to provide insights into the nature of the Japanese motorcycle market and the strategies employed by the four companies to maintain their competitive positions. Ultimately, our study contributes to a better understanding of the importance of this oligopoly and its impact on the motorbike industry.

Keywords: *Oligopoly, motorbike industry, market strategy, pricing discrimination, competitive behaviour, market share*

JEL Codes: *L11, L13, L62, L66, L81*

Introduction

Over the past century, the ideology of a free market has been the cornerstone of the capitalist mindset. However, the reality of the market is much more complex than the idealistic portrayal of a self-correcting market driven by competition. Various theories have been put forth to explain the transactions between buyers and sellers in a market, but the oligopoly theory seems to best explain the prevailing dynamics of global markets. An oligopoly is characterized by the presence of only a few firms in the market that control prices, entry barriers, and the amount of supply. These firms can either collude or compete with each other depending on the benefits yielded. Competition occurs when a company believes it will result in higher profits than colluding with other companies (Elrado, 2020).

Oligopolies exist in several markets around the world, including the automotive industry. The American automotive market is a well-known example of an oligopoly, with General Motors, Ford, and Chrysler colluding on pricing and market offerings to avoid

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excessive competition. Each company dominates a certain segment, with GM leading the sports car segment and Ford controlling the family car segment. Similar collusion occurred in Japan from the 1980s until 2005, with Japanese automakers agreeing to limit their cars' power output to 276 horsepower to minimize deaths from accidents. This agreement was broken in 2005 when Honda released a 296-horsepower car, and it was revealed that several Japanese companies had cheated to increase their cars' sales (Elrado, 2020). Oligopolies are not limited to the automotive industry but also exist in the motorcycle industry.

This paper aims to analyze the nature of the Japanese motorcycle market. The literature review provides an overview of market theories that explain market dynamics, followed by an investigation into the nature of the market and whether the four Japanese companies (Suzuki, Kawasaki, Yamaha, and Honda) are in a state of collusion or competition.

Literature review

Oligopoly markets are controlled by a limited number of players who collaborate to control the pricing of goods and set market entry barriers. This allows firms involved in oligopolies to obtain a significant market share. The Nash equilibrium is a concept developed by Nobel Prize-winning mathematician John Nash that explains why players in a certain game decide to make or not make a certain decision. For example, players may change their strategy based on the movement of the other player. If both firms reach a similar price point, the Nash equilibrium is achieved, which is considered the optimized outcome for both firms (Holt & Roth, 2004).

Game theory is a mathematical model that explains how players interact in a given situation. It can be applied to various social phenomena, including board games and even simple games like rock-paper-scissors. Players in these games make their next move based on the reactions of the opposing players (Fujiwara-Greve, 2015).

The game theory can be divided into two types: cooperative and non-cooperative game theory. In cooperative game theory, players form coalitions and make joint decisions that will yield the best outcome for them. However, players only collude when it's for their benefit. In contrast, non-cooperative game theory involves competition among players, with each player making decisions that will ultimately benefit them. In non-cooperative game theory, firms try to achieve the highest market share possible without considering the consequences that will fall on their competitors (Madre, Axhausen & Brög, 2007).

The Japanese business model, also known as the Keiretsu Model, is a unique business model consisting of interconnected companies and supply chains. Companies within the Keiretsu network possess shares with each other, creating an intertwined relationship between the included firms. This model started appearing after WWII and helped reshape the Japanese economy significantly. Firms within a Keiretsu network in certain industries are connected to a single bank, and many firms operate in one industry together, creating an effective supply chain. The Japanese automotive industry is considered to be one of the most prominent Keiretsu networks, connecting automobile and motorbike companies, as well as Japanese tech giants like Hitachi and Fujitsu. A unique feature of this model is cross-shareholding, where almost all Japanese companies in a single industry have shares within each other, making hostile takeovers extremely difficult to emerge (Tomeczek, 2022).

In conclusion, understanding the game theory, as well as the Keiretsu Model, is crucial in analyzing the nature of oligopoly markets, such as the Japanese motorcycle market. The game theory helps explain the cooperative and non-cooperative behaviors of firms involved in oligopolies, while the Keiretsu Model provides insights into the interconnected relationships between firms in certain industries. Overall, the study of these theories and models is vital in understanding the strategies employed by firms in oligopoly markets to maintain their competitive positions.

History of motorcycles

Motorcycles have a long and rich history dating back to the Victorian era. In those days, motorcycles were powered by coal or alcohol and produced a great deal of power. With the commercialization of motorbikes, they began to take on the familiar form of today, with internal combustion engines running on gas instead of coal. During World War I, motorcycles gained increased interest, with manufacturers like Triumph and Harley-Davidson supplying bikes to the British and American armies, respectively.

Before World War II, European and American manufacturers dominated the market. However, after the war, Japanese manufacturers started gaining momentum and created what is known today as the Japanese Big 4: Yamaha, Suzuki, Kawasaki, and Honda, who dominate the motorbike market in Japan by forming an oligopoly (Yamamura, Sonobe & Otsuka, 2005). Yamaha was founded in 1955, a later stage compared to the other 150 manufacturers in existence at the time. Starting with a capital of 30 million yen and a production level of 200 motorcycles a month, the company expanded by providing new technologies and updated bikes in their showrooms.

Suzuki, on the other hand, was founded in 1909 under the name Suzuki Loom Ltd, with the founder's interest in the booming Japanese silk industry. When the silk industry declined, Suzuki diversified into motorbikes and began producing publicly acclaimed models in the mid-50s (Motorcycle.com, 2010). Kawasaki's history dates back to 1878 when Shozo Kawasaki founded the Kawasaki Tsukiji Shipyard in Tokyo. The company experimented in several industries, including locomotives, aeroplanes, and bridge construction, before releasing its first motorbike, the H1, in 1969 (Motorcyclecruiser, 2009).

Finally, Honda was established in the late 1940s and initially only manufactured piston heads before developing their first small-engine motorbike. Over time, Honda became one of the most important manufacturers of motorbikes in the world (History.co.uk). In conclusion, the Japanese Big 4 have a rich history that dates back to the mid-20th century. These companies have dominated the motorbike market in Japan by forming an oligopoly, with each company bringing its unique history and strengths to the industry.

The Japanese motorcycle industry is dominated by Honda, Yamaha, Suzuki, and Kawasaki, who collectively control one-third of the worldwide market. These companies produce a diverse range of motorcycles, with a focus on large engines with cylinder capacities of 250cc or above, primarily for export markets. However, the local market in Japan favours smaller bikes with cylinder capacities of 50cc or less. Although the Japanese Big Four have been innovative in their designs and technology, the local demographic of motorbike users in Japan is changing. There has been a decline in the recreational motorbike market, as environmental awareness grows and people seek alternative modes of transportation. As a result, the demand for bicycles and e-bikes has been steadily increasing in Japan, with a focus on environmental sustainability and healthy living.

To meet this demand, the big four have already begun producing electronic bikes and bicycles. In 2019, the companies collaborated to create swappable electric motorcycle batteries that are interchangeable between their brands. This agreement ensures that all batteries have the same size, weight, and safety features, and can fit in all the electric bikes produced by each firm. This collaboration helps the companies maintain control of the market and prevent competitors from entering (Jitchotvisut, 2022; Giacomini, 2019).

In conclusion, the Japanese motorcycle industry is undergoing significant changes as the local market shifts towards environmental sustainability and healthy living. The big four companies are adapting to these changes by diversifying their product offerings, with a focus on electronic bikes and bicycles. Additionally, their collaboration on swappable electric

motorcycle batteries is evidence of collusion in the industry, helping them maintain their dominance and prevent new competitors from entering the market.

Pricing collusion:

The 1000cc bike segment is extremely sought after. 1000cc sport bikes present a competitive market to bike producers. It also presents a price collusion opportunity for the Big 4 firms.

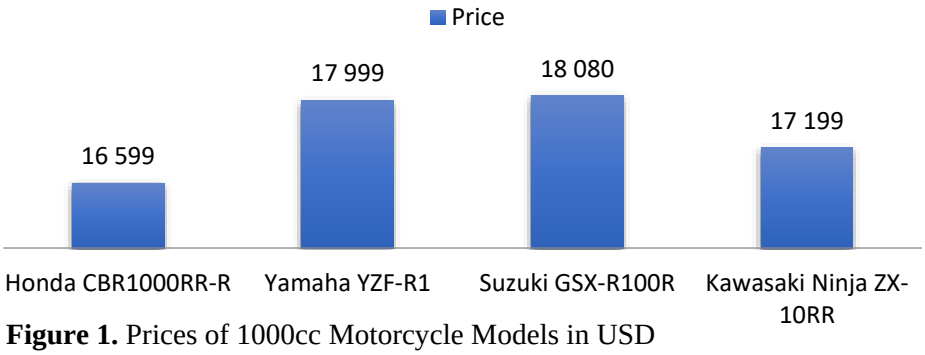
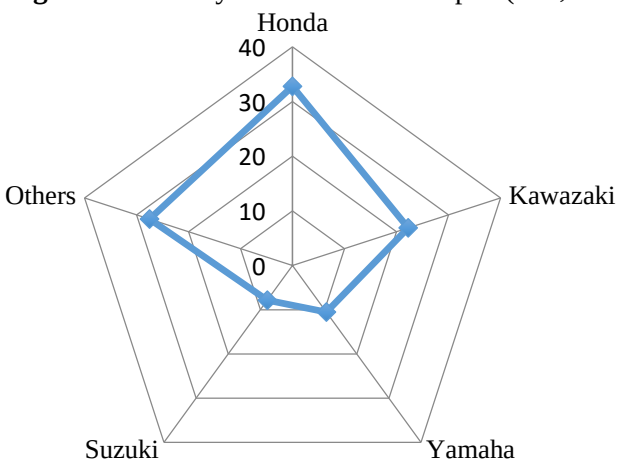


Figure 1. Prices of 1000cc Motorcycle Models in USD

Source: J.D. Power (2021).

Figure 1 displays the prices of 1000cc sport bikes offered by the four leading motorcycle manufacturers. The prices charged by each company are relatively similar, with Suzuki and Yamaha leading the price point. Interestingly, all four bikes offer the same performance, with an identical top speed of 186 miles per hour (see figure one). The pricing strategy employed by these companies suggests the presence of a cartel, which helps maintain fixed pricing while driving competitors out of the market.

Figure 2: Motorcycle Unit Sales in Japan (in 1,000 Units)"



Source: Arba (2023).

The graph above depicts the unit sales of motorbikes in Japan. Honda is the market leader among Japanese motorcycle manufacturers, accounting for over one-third of total sales. This shows that Honda is the largest member of the coalition and has a dominant market position.

Honda's success can be due to its involvement and domination in racing, which has helped develop a desirable business image and laid the groundwork for market dominance. Furthermore, the business incorporates its motorsport technology breakthroughs into the motorcycles sold to end customers, solidifying its position as an industry leader (Muniandy et al., 2020).

Examples of alliances within the oligopoly:

Yamaha and Honda small-engine motorcycles: The Japanese motorbike market has witnessed an age-old rivalry between Honda and Yamaha for many years. However, this rivalry came to an end in 2016 when the two companies announced a truce in the form of an alliance. To comply with safety and emission regulations, the two companies announced they will work on 50cc scooters and electric scooters. Unusually, Honda announced that this collaboration would be limited to a certain declared class of scooter and would not extend to the international market (Inagaki & Lewis, 2016). The technicalities of the collaboration are rather interesting. Honda agreed to supply Yamaha with equipment for the small engine scooters to act as the original equipment manufacturer. Using the equipment supplied by Honda, Yamaha will release small engine scooters under their name. The two giant firms are trying to popularize the idea of small-engine scooters within the country. They see that small-engine scooters will help make the commuting experience of young Japanese citizens more enjoyable and more efficient. They have also agreed to address the efficiency issues facing electric scooters. Those issues include range, cost, performance, and charging time. The partnership between the two companies became effective in 2018 (Carter, 2016).

Suzuki and Kawasaki sharing platforms: The oldest alliance in the Japanese motorcycle market was when Suzuki and Kawasaki struck a deal to create a partnership that would help them co-develop motorcycles in 2001. The two companies agreed to a shared platform for their motorcycles. This means that they will release the same motorcycle, However, those will bear different names, different cosmetics, and of course, different badges. An example was the Suzuki DR-Z125 and RM65, which are sold under Kawasaki bearing the names KLX125 and KX65. Moreover, the two companies agreed upon sharing parts sourcing. This will allow them to expand even more, especially in the global market. Furthermore, the co-development of future motorcycles and ATVs (all-terrain vehicles or beach buggies) was established to utilize new sales opportunities (Edge, 2002). As of 2006, the alliance between the two firms was discontinued. Both companies claimed that a narrower more focused market approach will help them both further develop their own brand identities in the Japanese market.

Kawasaki's joint venture with Indian Bajaj Auto: Kawasaki succeeded in expanding into the Indian motorbike market when it announced a partnership with Indian giant Bajaj Auto to sell and service Kawasaki motorbikes in India. Bajaj allowed Kawasaki to offer its motorcycles in its showrooms. Those included Kawasaki sport bikes like the Ninja 300, Ninja 650, and the ER-6N. Before the 2010 partnership, Kawasaki and Bajaj co-developed several products that were badged under "Kawasaki-Bajaj." Those products included the small engine KB-100 and calibre. The partnership only developed until the 2009 partnership agreement. Bajaj agreed to offer sales and after-service for Kawasaki bikes in its premium "pro bikes" showrooms (Iyer, 2017). Both companies had a mutual agreement to terminate the partnership in 2017 without giving an actual reason. Exceptionally, the two companies agreed to keep their cooperation effective in the international market. However, it was found that Bajaj preferred to focus on the sale of Austrian KTM motorbikes[3], in which Bajaj holds a 48% stake (Madhavan, 2017).

[3] KTM AG (Kronreif & Trunkenpolz Mattighofen; previously known as KTM Sportmotorcycle AG) is an Austrian company that manufactures motorcycles, bicycles, and sports cars. The company is owned by Pierer

Conclusion

The Japanese Big 4, comprising Honda, Yamaha, Suzuki, and Kawasaki, represent a unique case of oligopoly in the motorcycle industry. The advanced state of this oligopoly has strong historical roots and is characterized by a firm grip on the Japanese market, making it almost impossible for competitors to penetrate. The four companies collaborate closely, sharing technology and establishing joint ventures to survive in both the local and international markets. While they compete with each other, this competition ensures a healthy market. Attempts by companies like Kawasaki to join forces with foreign competitors have not yielded the desired results, emphasizing the strength of the local oligopoly.

The oligopoly in the Japanese motorcycle market is a healthy, strong, and resilient cartel that would discourage and shut down any potential competition from emerging in the Japanese market. The continuation of this oligopoly is essential for the survival of the involved companies, and its advanced state denotes a slow and sluggish advancement for the four companies in the case of its discontinuation. A perfectly competitive Japanese motorbike market would make it harder for the Big 4 companies to sustain their dominance.

In conclusion, the Japanese motorcycle oligopoly is a well-established case, and its continuation is essential for the survival of the involved companies. Any attempt to break this oligopoly would require significant effort and resources, which may not be feasible for new entrants. Therefore, it is recommended that the Japanese government should continue to support the oligopoly and create an enabling environment for the Big 4 companies to thrive. Nevertheless, the government should also monitor and regulate the oligopoly to ensure that it does not stifle innovation or undermine consumer interests.

Mobility AG and the Indian manufacturer Bajaj Auto. Although KTM AG was formed in 1992, its roots can be traced back to as early as 1934.

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