

# Exploring Reasons of Formula 1 Team's Underperforming in F1 Racing

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**Abstract.** The COVID-19 pandemic imposed unprecedented challenges on Formula 1 (F1), intensifying financial and technological disparities among teams. Haas F1, a relatively new entrant to the sport, has struggled with consistent underperformance since its peak in 2018. This paper explores the factors contributing to Haas F1's decline, focusing on financial limitations, reliance on external technology, and ineffective global operations. The 2020 pandemic exacerbated the team's existing struggles, particularly in securing sponsorship and navigating the new budget cap regulations introduced in 2021. Additionally, Haas's dependence on Ferrari for essential car components has constrained its technological innovation, leading to further competitive disadvantages. Despite attempts to restructure the team and improve performance through financial and strategic changes, Haas has yet to achieve sustained success. This paper examines Haas F1's case through qualitative analysis and proposes improvements, including diversified funding strategies and increased investment in internal research and development, to enhance competitiveness in the evolving F1 landscape.

**Keywords:** Haas F1; Financial Limitations; Technological Innovation; COVID-19 Impact.

## 1. Introduction

The COVID-19 epidemic presented an unparalleled challenge to the realm of sports, including F1. F1, esteemed as the apex of motorsport, has undergone substantial evolution since its establishment in 1950. The sport has had numerous regulatory modifications and technology innovations, all intended to enhance driver safety and increase entertainment value for spectators. Although these alterations have influenced the essence of racing, they have concurrently posed difficulties for teams in sustaining competitiveness. A critical episode in recent F1 history was in 2020 when the COVID-19 outbreak significantly disrupted the sport, with repercussions that persisted for years. The sport has experienced the introduction of new laws, encompassing a comprehensive array of technical and financial modifications enacted in the 2022 season, which further transformed the competitive environment.

The season was initially scheduled to include a record 22 Grand Prix; however, the pandemic necessitated the cancellation of several races, resulting in the season's delayed commencement in July in Austria after a four-month hiatus. Stringent health precautions, with mandatory quarantines, bio-secure containers, and diminished personnel, became integral to the sport. Travel limitations and economic pressures resulted in certain teams experiencing greater difficulties than others. The effect was particularly pronounced for smaller teams, such as Haas F1, which function with constrained resources. The economic decline caused by the epidemic resulted in diminished sponsorship earnings and overall budget reductions. This exacerbated the challenges for financially disadvantaged teams to compete with larger, better-funded entities such as Mercedes and Red Bull, hence expanding the competitive disparity.

Additionally, the pandemic accelerated discussions around cost control in F1, which resulted in the introduction of a budget cap starting in 2021. For the first time in F1's history, a financial ceiling was imposed, limiting the amount teams could spend on car development and operations to \$145 million annually. The purpose of this cap was to create a more level playing field by curbing the advantage that wealthier teams had traditionally held. While the budget cap was expected to benefit smaller



teams like Haas, who were already operating below this limit, it also came with its own challenges. For example, teams that had previously relied heavily on large-scale technological advancements found themselves restricted by the new financial limitations.

Furthermore, COVID-19's global supply chain issues had an impact on car development. Teams faced delays in receiving parts and materials, which hindered their ability to introduce mid-season upgrades. Another major turning point for F1 was the introduction of new technical regulations in 2022. These regulations marked the most significant overhaul of the sport's aerodynamic rules in decades. In conclusion, F1 has undergone significant changes in recent years, driven by both external factors like the COVID-19 pandemic and internal regulatory overhauls. The pandemic not only disrupted the 2020 season but also accelerated the introduction of cost controls that have since reshaped the sport's competitive landscape. The 2022 technical regulations have further leveled the playing field, providing smaller teams like Haas with an opportunity to close the gap on their better-funded rivals. However, teams like Haas must overcome both financial and technical challenges to fully capitalize on the new regulations, making the success of these changes uncertain.

In this context, understanding the factors that influence team performance, such as budget constraints, reliance on external technology, and the ability to innovate under regulatory limits, is crucial to analyzing the future of F1's competitive balance. This paper will apply the case analysis study, examining the reasons behind the team's sustained poor performance and suggesting improvements based on theoretical frameworks and previous research.

## **2. Case Description**

Haas made its official debut in F1 in 2016, becoming the first fully American-led team in the sport in three decades. Founded by Gene Haas, the team is based in Kannapolis, North Carolina, where it shares facilities with Haas's successful NASCAR operation. After they join F1 racing for 2 years, they deliver their best performance in season 2018, finishing at 5th place at constructor's championships. Nevertheless, the team's expectation at the start of season 2019 is to become the best in the midfield, which finished in 4th place at constructor's championships.

Nevertheless, the technical issues of cars frequently affect drivers, hindering the team's ability to make effective upgrades and causing constant confusion. Then, Gene Haas openly questioned the team's future in F1 after 2019 due to difficulties in finding sponsorships, especially during the COVID-19 pandemic. The financial situation got worse. However, after the risky decision made by team leader Guenther Steiner, who chose to give up the 2021 season directly and restart Haas F1 racing in 2022 by finding funds through drivers like Nikita Mazepin and his Uralkali sponsorship, the team managed to survive through the season 2021, and their primary objective is to move up from the last place back to the midfield in the following season.

Since 2019, Haas F1 has always had a decent start at the beginning of the season, but soon faced a decline in performance, dropping from 4th place to 9th in the constructors' championships. Significant drops occurred in race finishes and overall points. In 2020, the team scored only 3 points across the entire season, with Romain Grosjean and Kevin Magnussen finishing 19th and 20th in the driver standings, respectively [1]. Upcoming to season 2022, the team leader, Guenther Steiner, restarts the Haas F1 racing and wants to make a comeback this season. They do achieve some success; Kevin Magnussen finished in 5th place at the first race and secured the team's first pole in the qualifying session in the team's entire history. Yet, they still can't make the right upgrades during the middle of the session, dropping from 5th to 8th place on the constructors' leaderboard. Financial constraints and reliance on outdated technology and external suppliers, such as Ferrari for parts, have hindered the team. Furthermore, the driver's actions contribute to Haas' failure to come back. Mick Schumacher fell short of expectations, crashing his car three times. He has six DNFs in the 2022 season, and it cost up to €4,212,500 to repair his car.

### **3. Analysis**

#### **3.1. Financial Limitation and Insufficient Investment**

A major factor contributing to Haas's poor performance is the absence of sponsorship funds. They've been struggling with capital constraints and underinvestment.

In general, a competitive Formula 1 team needs a budget of around \$150 million per season to compete effectively. For Haas, the budget falls short of that standard. Their spending is only close to the \$135 million cost cap, which is a pittance compared to top teams like Mercedes or even mid-range teams like McLaren and Alpine. Most small business owners in sports management have neither business experience nor training. Even for established firms, they are neither new nor profitable; many firms are not equipped to adapt to changes in the business environment [2].

For the 2021 season, Haas took a considerable risk by replacing the previous drivers with two rookies, Schumacher and Mazepin, and opted not to upgrade their car, relying on outdated technology from 2019 and 2020. Financial constraints drove the decision, which led to the team underperforming and finishing last in the constructors' championship. Even in preparation for the following season, their lack of investment and poor results further increased tensions with investors, who began to question the viability of continuing in the sport if the team's performance did not improve.

#### **3.2. Reliance on External Technology and Lack of Innovation**

Haas F1's reliance on Ferrari for the majority of its car components, including chassis and power units, has significantly constrained its technological innovation. The team is significantly dependent on Ferrari for essential components, including as the engine and transmission, which constrains their capacity to create distinctive tailored solutions that could enhance performance. Haas allocates less resources to internal development, whereas other teams invest significantly in independent research and development. Haas has designated a significantly smaller fraction of its budget to research and development compared to other midfield teams that have invested substantially in aerodynamic innovations and unique technology.

The team's performance throughout the 2019 season clearly demonstrated a deficiency in innovation, as their vehicles exhibited aerodynamic instability, resulting in subpar race outcomes [3]. The constraints of depending on standardized components from Ferrari hindered Haas's ability to swiftly adjust to evolving regulations or create customized solutions that would provide a competitive edge. The team's dependence on external technology resulted in an initial great performance for Haas at the season's outset, as competitors had not yet deployed their upgrades; nevertheless, they rapidly lagged when rivals integrated more sophisticated technology during the midway. This tendency underscores the necessity of sustained innovation to maintain F1's competitiveness over the long term.

Research and industry publications emphasize that innovation and technological autonomy are essential for sustaining F1's competitive advantage. Organizations possessing robust internal R&D skills are more adept at adapting to regulatory modifications and fostering innovation, leading to enduring success. Absent that capability, Haas confronts a significant problem in competing effectively, as their performances have deteriorated in recent seasons.

#### **3.3. Global Operations and Team Management**

Operating in many countries presents problems for Haas F1, including the management of cultural disparities and complications.

The Haas team has not cultivated a brand identity comparable to that of Red Bull or Ferrari, making it more challenging for them to expand their recognition. The 2021 season, characterized by the global pandemic, presented Haas with extra obstacles, including supply chain disruptions that adversely affected performance. The team should enhance its management practices. Under certain conditions, Haas exhibits erratic decision-making and demonstrates a lack of control over team members. During

the 2020 season, Honda F1 drivers experienced numerous retirements attributable to technical malfunctions. Romain Grosjean and Kevin Magnussen, the two principal drivers, together withdrew from six races during the season owing to vehicle-related issues. Furthermore, the strategy group's precarious decision resulted in both drivers losing numerous opportunities to accumulate points.

## **4. Suggestion**

### **4.1. Suggestion on Addressing Financial Constraints**

Now, the team needs external funding, just like how Lawrence Stroll sponsored Racing Point, so they can develop better cars and strengthen the entire team's management.

To improve their financial position and subsequently improve their race performance, Haas F1 should diversify its funding sources by actively seeking new sponsors and investors. Focusing on less affected sectors, such as technology and renewable energy, could open up new revenue streams. In addition, developing innovative partnerships, similar to alliances seen in other successful teams, can help mitigate budget constraints while maintaining a competitive edge. Evidence from other F1 teams, such as Williams and Aston Martin, shows that diversified funding can significantly improve performance by providing the financial stability needed to invest in necessary upgrades and developments throughout the season. This approach is particularly important in an era where continuous technical progress and mid-season upgrades are crucial to maintaining performance levels.

Research and historical data show that teams with diversified funding sources and strong sponsorship deals are better able to cope with Formula 1's financial challenges [4]. Take Alpine as an example. It has successfully attracted key sponsorships through a combination of the following strategies: Studies have demonstrated the existence of strong connections.

There is a correlation between the performance of the sponsored team, the realized brand exposure of the sponsors, and the price paid. Sponsorship level, functional congruence, and national pride also have an influence on price.

Teams can allocate more resources to research and development, driver development, and strategic planning to improve race results. In Haas' case, attracting a new sponsor could not only provide the necessary financial cushion but also boost the team's brand image and make it more attractive to potential drivers and engineers. The ability to secure consistent funding has been crucial for Haas to break the cycle of underperformance and establish itself as a stronger competitor.

### **4.2. Suggestion on Strengthen Scientific and Technological Innovation**

Technological innovation is progressively propelling the F1 industry as teams relentlessly push engineering limits to gain a competitive advantage. Haas F1's substantial dependence on foreign suppliers, particularly Ferrari, for essential components has emerged as a considerable impediment. This strategy originally enabled Haas to establish itself in the sport; however, insufficient in-house research and development resources constrained the team's capacity to innovate and adapt to the swift technical advancements required for competitiveness. Conversely, teams like Red Bull and Mercedes, which have significantly invested in their own research and development, have continually surpassed their competition by creating customized solutions suited to their particular requirements.

Considering Haas F1's existing circumstances, characterized by constrained technical resources and dependence on Ferrari, the team must allocate resources to establish its own research and development department. The investment will enable Haas to create components that are specifically engineered to improve vehicle performance rather than relying on parts that may not be entirely optimized to meet demand. Research in automotive innovation indicates that teams possessing robust internal R&D capabilities are more inclined to attain sustained success. Internal innovation can rapidly adjust to regulation modifications and cultivate a culture of ongoing enhancement, which is vital for a dynamic sport such as F1.

### **4.3. Suggestion on Optimizing Global Operations and Management**

According to Statista data exhibited in Figure 17, the global outdoor equipment industry revenue scale in 2022 is about 2002.0 billion US dollars, an increase of 10.49%, and the data is expected to reach \$226.5 billion in 2024 and \$236.3 billion in 2025. Apparently, the global outdoor equipment industry is developing.

Starting in Season 2021, every team will have a precise budget cap, which is designed to prevent some large teams from continuing to develop their cars in their own factories, bypassing budgets. As F1 faces both opportunities and challenges, they got the chance to catch midfield teams since they have closer budgets. The team's facilities in the US and UK are crucial to its operations, but managing these geographically dispersed units requires a strong and cohesive management structure. Unlike established teams such as Ferrari or Red Bull, which have centralized operations and strong brand recognition, Haas has struggled to establish a unified team identity. This lack of cohesion is particularly evident in the team's erratic performance and strategic decisions.

The global pandemic further exposed the weaknesses of Haas during the 2021 season. Covid-19 affected the 2020 season, leading to the cancellation of the United States Grand Prix in July 2020 and races in Brazil, Canada, and Mexico due to the growing number of Covid-19 infections and restrictions in the Americas [2]. The pandemic has caused significant supply chain disruptions, delayed the delivery of critical components, and exacerbated communication challenges within teams. These delays lead to inefficiencies in executing strategic decisions and negatively impact the overall performance of the team. In addition, a decentralized management approach that relies heavily on regional managers sometimes leads to a lack of coordination and oversight, leading to operational failures such as multiple race retirements due to technical issues for the 2020 season.

Research shows that successful management of multinational teams requires a centralized decision-making process, strong communication strategies, and the ability to quickly adapt to unforeseen challenges [5]. Teams that excel in these areas tend to perform more consistently, even in the face of external pressure. For Haas, implementing a structured management framework that emphasizes cross-cultural training and improved communication can help the team respond more effectively to global challenges. Better management practices can not only improve team cohesion but also enhance the decision-making process, resulting in more consistent and competitive performance on the track.

## **5. Conclusion**

In summary, this paper has analyzed the challenges faced by Haas F1 in maintaining competitiveness within the highly demanding environment of F1. Under the backdrop of significant external disruptions like the COVID-19 pandemic and internal regulatory shifts such as the 2022 technical reforms, Haas has been exposed to multifaceted challenges that have exacerbated its struggle. The COVID-19 pandemic in particular had a profound impact on the team's ability to operate effectively, further complicated by the reduced revenue streams and increased logistical pressures. In addition, the 2022 regulations, designed to level the playing field through ground-effect aerodynamics and budget caps, provided Haas with opportunities to improve performance, though the team still struggled to fully capitalize on these changes due to financial limitations and reliance on external technology from Ferrari.

The findings indicate that the financial constraints and lack of independent technological innovation have been key barriers for Haas in achieving consistent performance improvements. The budget cap and new regulatory framework offer smaller teams like Haas a chance to close the gap on top-tier teams, but these teams must develop more robust internal capabilities to take full advantage of the wind tunnel and aerodynamic testing allowances granted under the new rules. Moreover, Haas's reliance on external components continues to limit its potential for innovation, underscoring the need for more in-house research and development to break free from this dependency.

The present study confirms the broader challenges associated with operating a Formula 1 team on a limited budget, highlighting how financial constraints can significantly impair a team's ability to innovate and compete. Expected to foster closer competition, the new regulations also place smaller teams under pressure to maximize their limited resources efficiently. For Haas, this means adopting a more strategic approach to resource allocation and finding ways to extract more performance from the available tools under the regulatory framework.

In terms of future research, further investigations could explore how smaller teams in F1 adapt to regulatory changes over the long term, particularly in the areas of technological development and financial management. The 2022 regulations present an important case study for understanding how budget caps and aerodynamic restrictions can influence competitive dynamics. Additionally, research could conduct more detailed analyses on the role of external partnerships, like Haas's relationship with Ferrari, in shaping team performance and innovation within the current F1 structure.

The limitations of this study include the focus on one team, Haas F1, which may not provide a comprehensive view of how other teams with different financial structures and operational strategies are adapting to the new regulatory environment. Furthermore, while the analysis highlights key issues affecting team performance, further research could incorporate more quantitative data, such as financial reports and performance metrics, to offer a deeper understanding of the relationship between financial constraints and on-track performance.

In conclusion, the future competitiveness of teams like Haas will likely depend on their ability to adapt to F1's regulatory and financial landscape. While the sport has taken steps to level the playing field, significant gaps remain between teams with substantial internal capabilities and those that rely heavily on external support. Addressing these gaps will require continued innovation, strategic planning, and, potentially, further regulatory adjustments to ensure a truly balanced competitive environment for all teams.

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