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A first assessment of the financial distribution by the FOM and performance in Formula 1

Master's thesis in Innovation and Industrial Management
Graduate School
University of Gothenburg
Spring 2018

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Acknowledgments

There are several key individuals that I would like to thank for making this thesis possible.

Firstly, a special thanks to the respondent in this thesis, from whom the study received valuable input which allowed for a deeper understanding of the sport.

Secondly, I would like to thank my supervisor Dr. Evangelos Bourellos for his excellent support and interest in this thesis. His feedback empowered me to move forward in difficult situations and enabled a good finished result.

Lastly, I would like to thank family and friends for their wonderful support. They have encouraged and helped me immensely during this fantastic journey.

Thank you!

Gothenburg 2018-06-01

Abstract

Formula 1 is known to be an exclusive and expensive sport where only the best of the best in motorsport is competing. There are currently ten constructors competing, but the Formula 1 faces financial difficulties where more and more teams find it hard to finance their participation in the sport. The Formula 1 uses an extremely uneven distribution of the prize money between the teams and this thesis aims to assess the relation between the financial distribution and the performance of the Formula 1. The research question used is: *To what extent is the prize money distributed by FOM affecting the teams and their performance?* There is furthermore a discussion of potential correlations between the money distributed by the Formula One Management (FOM), and the teams' performances the next year.

To answer the research question, this thesis uses a multiple case study of three teams in particular. An interview has furthermore been conducted to establish the main problems the sport is facing with the current financial system. What the study found was that there indeed is a big gap between the best payed and the worst payed team within Formula 1 and that it is not always the winning team that receive most payment due to additional bonuses. The study furthermore found that there is a strong correlation between the pay-outs and the teams position at the end of the year. Moreover, the study concludes that there must be an incentive to compete, and win, for the sport to be sustainable as well as entertaining for the fans to watch. The current situation is feared to be unsustainable for the sport and that the management must find a new solution to the financial difficulties within the sport. Tournament theory is suggested as a possible solution if implemented correctly but the Formula 1 must choose whether they should support a few particular teams or intensify the competition and thereby try to create closer racing and an even more exciting sport.

Key words: Formula 1, prize money, tournament theory, sports performance, sports management, bonuses

Concepts and definitions

FOM: Formula One Management, one part of the old Formula One Group. They were the commercial owner of Formula 1 and oversaw the prize money distribution.

FIA: Fédération Internationale de l'Automobile, oversees both the sporting regulations as well as the safety and technical regulations of the car.

Team Principal: The team boss, has the highest power within the team and full disclosure of the sport.

Grand Prix: Each race in Formula 1 is called a Formula 1 Grand Prix.

Points: The points are distributed to the 10 best placed drivers and their teams after each Grand Prix. The winner receives 25p followed by a sliding scale (18p/15p/12p/10p/8p/6p/4p/2p/1p). Drivers that finish outside of top 10 receives 0 points.

Constructor's Championship: The team with the most points at the end of the season collected through all of the Grand Prix wins the Constructor's championship.

Driver's Championship: The driver with the most points at the end of the season collected through all of the Grand Prix wins the Driver's championship

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1. Introduction

In this chapter the topic of the thesis and the motives behind it are introduced by discussing the background in general and problematizing the subject. This leads into the establishment of the aim of this thesis and the research question designed for achieving it.

1.1 Background

The Formula 1 racing today consists of ten teams, or “constructors” as the Fédération Internationale de l'Automobile, FIA, defines them (Formula 1 Teams, 2017). The Formula 1 teams compete in the Constructor’s Championship, which is bestowed upon the team with the highest number of points collected throughout the season. Furthermore, the drivers themselves competes in the Driver’s Championship, which is awarded the driver who has the most points at the end of the season (Castellucci, F. Ertug, G, 2010). Each Formula 1 team competes with two cars every race, and the race calendar in 2017 consisted of 20 races on different locations distributed over the year (Formula 1 Races, 2017).

To be able to race in Formula 1 the teams must manufacture the chassis to their cars themselves, but the rest they can choose to develop themselves or buy from suppliers (Castellucci, F. Ertug, G, 2010). This implies that there are both car manufacturing teams, like Mercedes and Ferrari, as well as non-car manufacturing teams like Red Bull Racing and Williams on the grid. If a new team wish to enter the sport they need to apply to the Fédération Internationale de l'Automobile, FIA, since they are the ones in charge of the regulations and safety of Formula 1.

The administration of the sport Formula 1 basically consists of three different parts. First there is the Fédération Internationale de l'Automobile, FIA, which is the supreme governing body. The FIA holds the right to make regulatory changes to the Formula 1 as well as to other motorsports under their governance and it is their standardised rules that is the framework of the sport. The pronounced aim of FIA is to “bring coherent governance and safety to motor sport” (FIA About, 2017).

The second part of the administration is the commercial owners, the Formula One Management (FOM). The layout of these owners has changed immensely over the years and with the recent acquisition in the beginning of 2017 the new owner is the Liberty Media Corporation. However, the data used in this thesis is primarily from the years 2013 up until 2017, during which years Delta Topco was the parent company of Formula 1, controlled by the investment companies

CVC Capital Partners fund and JPMorgan. Furthermore, the remaining shares were owned by Bernie Ecclestone's family trusts, by Ecclestone himself as well as by some financial advisers.

The third major part of Formula 1 is the teams, or the "constructors" as they are called, that compete in the sport. Over the years many constructors have changed management, changed owners, quit competing all together or entered as new competitors. The only team that has competed since the start in 1950 is Ferrari (Ferrari^a, 2017).

Unlike other sports where the rules stay the same year after year, Formula 1 are constantly changing the rules to encourage innovation, increase safety and improve the entertainment of the sport. The changes can be small but also change the car completely. Because of this expensive nature of the sport, the constructors must agree on the major changes when it comes to regulations of the car. This contract, called the Concorde Agreement, lays down the regulatory framework of the sport and it is an agreement between the FOM, the FIA and the participating constructors (FIA Concorde, 2017).

The Formula 1 is an extremely expensive sport that have since its beginning in 1950 been recognised as one of the most exclusive and technologically advanced sports in the world. Media have during the years tried to figure out exactly how much the teams are spending on producing the cars but only a hand full of people seems to have the overall knowledge of the cost and financial management. However, some publications have shown estimated numbers of how much financial means the teams receive each year, and there can be a difference of over \$100 million between the best paid and the lowest paid team (Autosport payment, 2017).

Because of the extreme differences in financial contributions, lawsuits have been made towards the Formula 1. In September 2015, Sauber and Force India, two of the smallest teams in the sport lodged a complaint to the European Union concerning the governance of the sport and the uneven distribution of prize money (Autosport, 2017). Anneliese Dodds, a member of the European Parliament economic and monetary affairs committee, submitted a report calling for an immediate investigation of the Formula 1's governance and payment structure in 2015. The amendment was later passed in European Parliament in February 2017 with 467 votes to 156, 86 votes were abstentions (Autosport, 2017; ESPN, 2017). The investigation was however never completed due to Sauber and Force India withdrawing their complaint.

The accusations of Formula 1 having "anti-competitive" practices are based on the uneven distribution of prize money. A projection done by Autosport showed that Ferrari would receive the most money coming in to 2017 (Autosport Payment, 2017). The payment system is based

on a few different variables. First the teams get a payment based on their participation over the two previous years. This payment is divided equally among all teams that participated for both these years. Second, the teams get a payment based on their result at the end of the previous year. This payment is divided with a sliding scale from the 1st to 10th place, any team below 10th place will not receive any payment. Thirdly, there are a few teams which have special agreements and thereby receives Constructor's championship bonuses. Apart from this, there are also some additional payments that goes under the label "other". Ferrari receives for example \$70 million in bonus for being the only team competing every year since 1950. This means that Ferrari received \$105 million coming in to 2016 just in bonus payments, which is more than double of what Manor received (\$47 million) for their entire season (ESPN, 2017). Manor was later that year one of the teams that had to declare bankruptcy.

These financial contracts have been in place for a very long time and they are highly favouring the bigger teams. All the big teams like Ferrari, Mercedes, Red Bull, Williams and McLaren are obtaining some sort of bonuses while the smaller teams like Force India, Renault, Toro Rosso and Sauber do not (Autosport payment, 2016).

Because of the complex nature of the sport, countless studies have been made on collaborations between competitors, optimal business models in technological industries, exchange relationships, innovation management, competitive advantage, trajectories and much more. However, most studies discuss the management of the different teams, or how the hosting country can profit from having a Formula 1 Grand Prix (Aversa et al., 2015). Few studies have been made within the management of the actual sport, emphasising on the governing body. Furthermore, because of the complexity and politics of these financial contracts, no study has dealt with the financial issue within the Formula 1. There is no doubt that the distribution is unequal between the teams, but the question is whether this is hurtful for the sport in the long run. If the sport becomes too expensive, how many of the teams will withdraw their participation? It is known that multiple teams have had to declare bankruptcy because of lack of financial recourses. However, whether this could have been avoided with a more even distribution and whether the competition would have been more intense between the competing teams is yet to be studied.

1.2 Formula 1

This section will present the organisations behind the sport that is studied in this thesis. In January 2017 the Liberty Media Corporation announced that they completed the acquisition of Formula 1 (Liberty Media, 2017). They appointed Chase Carey as Chief Executive Officer in place of Bernie Ecclestone who has been on that post for many years. Liberty Media acquired the Formula 1 by buying it from Delta Topco, the parent company of Formula 1 controlled by CVC, and FIA. The study of this thesis is however conducted with data before the acquisition, when Delta Topco was the owner together with Bernie Ecclestone. This section will therefore explain the governance prior to this acquisition.

1.3 Fédération Internationale de l'Automobile, FIA

Formula 1 racing can be linked as far back as to racing in 1930's but the first official Formula 1 Championship, with the standardised rules conducted by the Fédération Internationale de l'Automobile, was not held until May 1950. As most sports, Formula 1 is governed hierarchically with the FIA at the top of the pyramid. FIA is the supreme governing body and holds the right to make regulatory changes to the Formula 1 as well as to other motorsports under their governance. Their aim is to “bring coherent governance and safety to motor sport” (FIA About, 2017). Through the years FIA has worked to improve safety for drivers as well as volunteers on the race track. With its high speed and close battles, motor racing is by nature a dangerous sport and FIA has been devoted to eradicating injuries and deaths from the sport.

FIA oversees both the sporting regulations and the technical regulations of the car. (FIA Regulations, 2017) The entry fees for the FIA Formula 1 World Championship is for example stated in the Formula 1 sporting regulations, produced by FIA. The commercial rights for the Formula 1 are however controlled by the Formula One Constructors Association, FOCA (later FOM), after a dispute between FOCA and FIA in 1980. The parties agreed after long negotiations and signed the first Concorde Agreement in January 1981, named after the place of the negotiations.

Another mission FIA has is to make sure that the drivers act responsibly on the track. The drivers must have a valid super licence which is issued by FIA to be able to race in the Formula 1 championship. The super licence is the highest existing class of racing licence.

1.3.1 Concorde agreement

The Concorde Agreement is a contract made between the Formula 1 Teams, the FIA and the Formula One Group. Over time there has been seven contracts with the first one signed in 1981 with following agreements signed in 1987, 1992, 1997, 1998 and 2009. The current agreement was signed in 2013 between the FIA and the Formula One Group and will expire in 2020 (FIA Concorde, 2017).

The Concorde Agreement lays the foundation for future development of the Formula One Championship. The agreement provides FIA with financial means to continue their regulatory work as well as their mission to improve safety. Furthermore, the contract dictates how the commercial revenue and prize money is divided between the teams.

1.4 The Formula One Group

Not to confuse with the new owners of Formula 1, Liberty Media, who with their acquisition of Formula 1 in 2017 changed name from the Liberty Media Group to the Formula One Group, this section will focus on the old Formula One Group.

The Formula One group was until 2017 a group of companies in control of the promotion and logistics and expansion of the FIA Formula One World Championship. The group has roots from the Formula One Constructors Association, FOCA, founded in 1974. FOCA was essentially founded to enhance the commercial benefits for the racing teams. After the first Concorde Agreement ended conflicts arose between FOCA and a committee under FIA concerning the rights to broadcasting revenues. The conflict later resulted in Bernie Ecclestone, the executive of FOCA, founding yet another company “Formula One Promotions and Administration” (FOPA) which would later become known as Formula One Management (FOM) (Formula 1 dictionary, 2018).

The FOM has continued to change structure and ownership over the years with Bernie Ecclestone selling off some of his ownership. Before the acquisition by Liberty Media Group, the group was owned by Delta Topco which was controlled by the investment companies CVC Capital Partners fund and JPMorgan. The remaining shares was still owned by Bernie Ecclestone’s family trust, by Ecclestone himself and by some financial advisers (Formula 1 dictionary, 2018).

1.5 Formula One Constructors

During the years there have been many constructors coming and going from the sport. The regulations concerning the constructors have changed many times, where the teams for example were able to buy chassis and motors from other competitive teams instead of building it themselves. This was both cost saving in terms of development cost as well as an efficient way to quick success if you had the financial means to buy from the best teams. This meant that there were both teams that were in fact automobile manufacturers as well as teams that had no such “core business” competing in the sport.

In 2008 many manufacturing teams left the sport because expenses were too big to justify. A few new teams joined in their place but many of them later had to withdraw because of financial difficulties. The constructors receive money from FOM based on previous performances. The money is distributed through a sliding scale from 1st place until 10th place. However, there is also payments that are distributed under the labels “constructor’s bonuses”, “long standing teams” and “others” (Autosport Payment, 2017). An overview of the financial distribution from FOM can be found in Appendix II.

1.6 Problem discussion

A general assumption is that technological innovation is directly linked to superior firm performance, meaning that one might disregard the key role of business models. By pronouncing a value proposition suitable to the new technology, the business model connects the technological and economic fields in a business (Aversa et al., 2015). Previous studies have largely discussed different business models in relation to the technological innovation but most neglect the effect that economics have on the business.

Not many studies have connected the economics of the business to management of sports. Szymanski (2003), discussed in his paper about the economic design within sports. Even though studies like this somewhat discusses the subject. Formula 1 as a sport is much more complex since there are more parties involved in the competition than just a few players in tennis or a few teams in football. There are the drivers, the FOM, the constructors, the regulators (FIA), the sponsors and the hosting tracks. One can say that the complexity grew as the sport itself grew in popularity and revenue. It came to the point that, in 1997, the European Commission conducted a study of the Formula 1 where they studied its organisation and commercialisation (García, 2006).

The basic problem that the Formula 1 faces is the rising expenditures and threats of teams leaving the sport because of financial reasons. Many say that the situation could be solved with a more even distribution of money between the teams. Of course, this would inquire that all the teams find the new distribution of money fair, or at least fair enough to continue competing in the sport. This basically means that a complete change in business model are needed for the Formula 1 to progress and become more valuable to all teams participating as well as their sponsors (Aversa et al., 2015).

When it comes to business models, there has been a shift to become more customer-centric in the recent years (Teece, 2010). With social media and the market place becoming more global, the consumers demand transparency. More and more firms that keeps an unethical or unfair business model eventually suffers as the consumer becomes more knowledgeable. In the case of Formula 1, there are many different types of consumers to consider. From the managements perspective, the most important consumers are the team's participating. Without them, there would simply not be a sport. Apart from them the sponsors and the hosting tracks are a central part of the sport.

However, to create a suitable business model is a difficult task. It demands that the entrepreneur fully understands its customers and features of the market it is competing in. A good business model could be a source of competitive advantage and a firm should therefore work to find an optimal model to be able to capture the most value (Teece, 2010). Looking at the different ways a firm can work with its business model it is possible to see who in the value chain will be the winner and loser. This furthermore means that changing the business model will affect the balance between the participants which in the case of Formula 1 is something that seems to be necessary for the sport to be sustainable over time.

Critics argue that the status that the higher-status firms bring to the sport are imperative for the survival of the Formula 1 (Castellucci and Ertug, 2010). Research have however shown that there is little, if any, negative impact on the status to the high-status firm after collaborating with a lower status firm. There is however evidence of greater effort resulting in higher performance when entering in such a relationship (Castellucci and Ertug, 2010). These results could argue that a change in business model where the lower status firms, with lower financial means, are given a more fair chance could result in greater effort and overall better quality for the sport Formula 1.

The structure of the prize money distribution within Formula 1 is in some ways similar to tournament theory. The basic idea of tournament theory is that the teams compete for a prize that is awarded depending on a hierarchical ranking rather than the absolute output (Connelly et al., 2014). Besides the fact that the prize awarded is based on ranking, the fundamental concept of tournament theory is that the prize spread is significant between the different positions in the ranks (Lin et al., 2012). A key idea is that there is a clear winner and loser in the end. Drawing parallels to the Formula 1 it is evident that the structure is based on the same principles.

It is believed that a large prize spread will encourage the participants to put in more effort and thereby the overall quality of the competition will be improved (Connelly et al., 2014). However, the willingness to compete is argued to be determined by the number of contestants in the tournament as well as the number of possible ranking levels. This means that the organiser must find an optimal prizing distribution to encourage both new and current contestants to compete.

There are however studies that show that high-tech firms should incorporate tournament theory with greater care. A firm that is more high-tech seems to demand more coordination and collaboration. Because there is a risk that an increased gap between different ranking positions might obstruct the willingness to collaborate and have a negative impact on the working atmosphere between these teams (Lin et al., 2012), to implement tournament theory might hurt the high-tech firm instead of creating better performance. In the case of Formula 1 it is true that the industry is high-tech, but since the teams are competing against each other, and not in-house, there is no obvious risk of tournament theory having a negative impact on Formula 1.

Another issue that Formula 1 faces in relation to tournament theory is that beside the prize money that is dependent on the ranking, there are also bonuses that is not affected by the ranking. Taking this into account, the principles of tournament theory cannot be fully applied to the Formula 1. If the competing teams were able to receive greater means if finishing in a better position, that would be a great incentive to put in more effort. That is however not the case since some teams get bonuses without having to perform, while others get very little more even if they would put in more effort. This unfair distribution obstructs the principles of tournament theory which would otherwise have been a source of motivation for the teams. This essentially means that questions like, “what would be the most optimal number of entrants to Formula 1?” and “what would be the most optimal distribution of prize money?”, becomes

much more difficult to answer and there are furthermore no known studies discussing this in relation to Formula 1.

1.7 Purpose of the study and research question

Taking all these problems into consideration, the purpose of this study is to make a first assessment of the financial distribution within Formula 1. This study thereby aims to discuss the distribution of the prize money and additional bonuses in relation to the teams. The aim is furthermore to analyse the premises of competition between the teams and incentives of innovations created. The following is the research question used:

To what extent is the prize money distributed by FOM affecting the teams and their performance?

2. Literature review

In this section the importance of exchange relationships is illustrated in relation to competitive advantage. This is followed by an elaboration of the incentives to compete and to innovate and the significance of a good business model and sports management. Lastly, tournament theory, a theory on prize distribution within sports is presented.

2.1 Exchange relationships

Within many sports as well as other arenas where competition between companies is central, the relationships between the firms are a key factor for successful development and sustainability (Jenkins, 2010). But the motives behind high-status firms collaborating with lower-status firms is not always obvious. If signalling were to be applied to the situation, higher-status firm would have nothing to gain from such a relationship whilst the low-status firm would be rewarded with higher status. Even so, studies still recognise that these relationships between different firms exists. Castellucci and Ertug (2010) argues that a firm's quality is related to its status which would explain why collaboration between the different firms exists. Status was in this case defined as "the perceived quality of the products of a producer relative to either the products of similar others or its competitors" (Castellucci and Ertug, 2010).

The starting point for this exchange relationship is that companies are prepared to put effort in exchange for status. This correlation essentially implies that higher-status firms can presume greater effort from low-status firms than from firms with equal status (Castellucci and Ertug, 2010). Evidence from such relationships have been found within the Formula 1 racing where the collaboration between the teams and their engine suppliers were studied for several years in the 1990's. The study concluded that the teams could indeed count on greater effort from lower-status engine supplier than they could if the supplier had similar status. They could also see that this bigger effort lead to an increase in the overall team's race performance. Furthermore, contrary to what many reason, there was no negative effect on the status for the high-status firms (Jenkins and Floyd, 2001; Castellucci and Ertug, 2010).

Previous research has mainly focused on the social aspects that the exchange relations between firms have (Jenkins, 2010). The researchers have argued that firms prefer to collaborate with similar status firms because of a risk of losing their position in the status hierarchy that the market is constructing. However, the study by Castellucci and Ertug (2010) questions this and argues that the actual quality outcome of the collaboration is what determines what status the company obtain, and that there is little risk of losing status because of a relationship with a lower-status firm.

2.2 Trajectories and discontinuities in technological evolutions

Studies of technologically intensive industries have revealed that incumbent firms often fail to adapt to technological discontinuities. Research shows that there is a relationship between technological discontinuities and competitive performance (Jenkins, 2010). There are furthermore arguments that there is a relationship between co-evolution, transparency and the development of dominant design (Jenkins and Floyd, 2001).

There have been many studies conducted on disruptive technologies where the researchers find that the disruptive innovation is most likely to be created by a new entrant than by an incumbent firm. Furthermore, these studies show that the incumbent firms are reluctant to changing their ways and thereby lose their competitive advantage (Jenkins, 2010). Previous studies on the Formula 1 racing have investigated how these technological developments occur within a highly competitive and fast changing industry as Formula 1 is, where teams that started competing in 1950 are still successful. The studies show that even within a sport where innovation is the core capability of the constructors, the incumbent firms seem to have difficulties adapting to changes (Aversa et al., 2015).

The studies of Formula 1 showed that firms succeeding in one era of regulations would not automatically be successful after the regulations changed and new innovations were in place. However, looking to a team, like Ferrari, that managed to stay competitive even with new entrants coming in to the sport a few potential explanations exist (Jenkins, 2010; Aversa et al., 2015). One explanation is that Ferrari managed to work proactively with new ideas and new technologies parallel to their work with the existing projects. Another alternative explanation is that their well-established relationship with other teams as well as the governing body, FIA, allowed them to anticipate trajectories and perhaps influence changes (Jenkins, 2010).

2.3 Competitive advantage within high-tech industries

To be able to produce continuous technological innovations is one of the most important attributes to have for a firm in high-tech industries (Jenkins, 2010). Knowledge and technological innovation is the source of competitive advantage, but firms cannot expect to create it successfully in complete isolation (Martín-de Castro, 2015). Firms in rapidly changing high-tech industries must develop new innovations faster and better than in other industries. This means that they need to complement their internal knowledge with external collaborations, and thereby depend on relationships with external experts (Martín-de Castro, 2015).

One of the most effective ways to sustain competitive advantage in this fast-changing landscape is to constantly come up with new innovations. Aversa et al. (2015) furthermore argues that successful firms often have multiple business models that they run simultaneously to increase revenue streams. Firms need to continuously deliver new products and try to be one step ahead (Martín-de Castro, 2015). There are many studies focusing on how to achieve the above in the most efficient way, for example through a “Knowledge-based view” or through “Intellectual capital-based view”, where they are trying to understand the competitiveness and how to overcome it. However, recent studies show that firms that are successfully competitive also rely on external knowledge to complement their capabilities (Martín-de Castro, 2015).

2.4 Competition and incentives to innovate

It is said that more market competition enhances the incentives to innovate (Boone, 2001). However, Boone (2001) concludes that there is a non-monotone relationship between the intensity of competition and the incentives to innovate since the value of the innovation changes as the intensity of competition changes. This means that the incentives to innovate can play out differently in different industries and in different contexts (Boone, 2001). Nonetheless, innovation is something that has become imperative for businesses, but it is not obvious how to incorporate it into the business processes. Studies conclude that employees must be given incentives to innovate and several models for doing so have therefore been invented (Manso, 2017). Manso (2017) for example discusses motivation models built on probability theory and experimental evidence, but he has furthermore used tolerance for early failure as measurement (Manso, 2011). This chapter will however focus on Boones study (2001) as it is most relatable to the competitive atmosphere within Formula 1.

When referring to intense competition, it is common to think about a market with many firms competing with price. But an increasing dominance from one firm in an industry does not necessarily indicate lack of competition (Boone, 2001). If the competing firms becomes more aggressive, then the leading firm most probably reacts by innovating. Put in an extreme scenario, the firm with highest market share is already the most efficient and as they innovate they will gain even more market shares and put even more distance to their competition (Boone, 2001). Considering this phenomenon in a situation where the aim is to raise competition in a certain industry or setting, actions that is meant to increase incentives to innovate might result in higher concentration in the industry instead of the opposite, i.e. a more equal competition. Boone (2001) does however argue that this is true when the competition creates a more

aggressive interaction between the existing firms, and not when the aim to create competition is carried out through for example reducing entry barriers. In this case more firms are expected to enter the industry and thus increase competition. To summarise, competition itself can be intensified by a rise in the number of firms present, or if the interaction between the existing firms becomes more aggressive (Boone, 2001).

As implied above, one must be able to answer two questions to know whether competition will give incentives to innovate or not. First, one must know what the level of the current competition is, and secondly one must know if the innovations in the industry is small, (as in small improvements) or if the innovation consists of big leaps forward (Boone, 2001). In a scenario where the competition is relatively weak, and the innovation consists of small improvements, one usually finds that the turnover from the innovation amongst the leading firms are high while the followers are leapfrogging. This mean that a small rise in competition would reduce the profits from the innovation and thus the incentives to innovate would decrease (Boone, 2001). Note that the solution to increase competition by reducing entry barriers, discussed in the previous section, will probably in this scenario reduce the incentive to innovate (Boone, 2001). Though if the innovations instead consist of major steps forward and the competition is intense, a small increase in the competition is anticipated to speed up the technological progress since leapfrogging is uncommon and thus the value of the innovation will be kept on the same level, or increase in value (Boone, 2001).

2.5 Business models

Plenty of literature exists about business models where the complexity of a firm's activities is elaborated on and the understanding of how firms capture value is enhanced (Gudiksen et al., 2014). There are however few studies that capture the relationship between the firm's choice of business model and its subsequent performance. A general assumption is that enhanced performance is directly correlated with technological innovations, but this assumption oversees the importance of good business models (Aversa et al., 2015).

The balance between the firm and its customer have shifted radically with the development of the global economy. The new era consists of greater communication, faster global trading, more supply alternatives and a greater demand for transparency which means that companies must become more customer-centric in their way of conducting business (Teece, 2010). Businesses that do not have a coherent business model will ultimately fail to capture value from its

innovations, or fail to deliver all together. There are of course many definitions of what a business model is but briefly summarised, the business model outlines how the business creates and delivers value to their customers and how they make the payments to profits (Teece, 2010). However, a good business model is not only put in place to profit from innovations. The design of the business model could itself be a source of competitive advantage (Aversa et al., 2015). There is always a risk that innovations are easily copied by new entrants or other incumbent firms, but it is hard to imitate a differentiated business model (Teece, 2010). There is still nowadays, despite a growing number of research papers concerning business models, multiple questions that needs solving (Aversa et al., 2015), and the lack of theoretical grounding might be due to the assumption that consumers will buy as long as value is created. Meaning that the business model comes in place to solve issues of pricing, production costs or distribution channels rather than being the core that all activities builds upon (Teece, 2010).

To create a business model that encourages and captures value from technological innovation is difficult. It demands that the entrepreneur fully understands its customers and features of the market it is competing in. The need for continuously improving the business models has never been as important as now (Gudiksen et al., 2014). Teece (2010) discusses two extreme paths that businesses can take to profit from its innovations. The first mode is when a firm takes responsibility for the whole value chain including innovation and production inhouse. The other direction is to outsource everything, preferably through licencing. However, the second type requires incredibly strong intellectual property rights. Otherwise, the firm might lose the value in favour of the licensee. The two paths both have pros and cons which means that a hybrid between the two is the most common used business model. Mostly companies outsource the manufacturing but keep sales and customer support inhouse (Teece, 2010).

Looking at the different paths a firm can take with its business model it is possible to see who in the value chain will be the winners and losers. This also means that changing the business model will affect the balance between the participants. A firm should therefore work to find an optimal model to be able to capture the most value and turn it into profit at the same time as they make sure they are sustainable over time (Teece, 2010).

2.6 Sports management

Sports management is a fairly young but a rapidly growing academic discipline (Chalip, 2006). Industries associated with sports has perceived an evident growth in economic attractiveness

for businesses which means that the importance of good management, specialized for sports, has been increasingly recognized (Newman, 2014). The need for specialized sports management was first mentioned in 1957 by former chairman of the baseball club “Dodgers” in USA. This eventually led to the creation of the Organization of Sports Management Resources Science at the University of Massachusetts, which was launched in 1970 (Drakulevski, L. et. al., 2014). This was the beginning of an era where sports were recognised as an opportunity for business. There are however critics that questions whether sports management is a unique discipline as for example Drakulevski et al. and Szymanski suggests in their studies. This discussion is according to Chalip (2006) a signal of determination to contribute to this new field.

However, just because the knowledge that sports management is important exists, does not mean that there is one model that works for all different sports. Stefan Szymanski (2003) established in his paper several economic designs/models for a number of different sports. The attempt was made to connect economic thinking to the design issues faced by the sports. The issues at stake could be about how many teams should be in a championship? How many players should be in a tournament? What is the optimal number of races? And so on (Szymanski, 2003).

When designing individualistic competitions, it is relatively easy to apply the contest theory (Szymanski, 2003). However, when there are more prizes than “winner takes it all” to be distributed it becomes more difficult. Firstly, organizers face a problem with the nature of the fans which is a bit different in a team sport than in an individual sport. In an individualistic sport, the supporters tend to choose one favourite contestant, usually one of the best players, to support and then change if they are unhappy with their performance. In a team sport however, the supporters tend to choose a team based on location or brand rather than performance. Furthermore, they stay with the team even though they do not have the best players, because they identify themselves with the location. The problem that the organizers face with this sort of behaviour is losing viewers because one team underperforms during a longer period of time. The supporters are unwilling to change team, and thus they simply stop following the sport. This means that the organisers must make sure that all teams have roughly equal chances of winning, or at least make sure that no team is constantly falling behind (Szymanski, 2003).

The studies conducted by Szymanski (2003) shows that a larger spread in prize money is preferred when the contestants are competing relatively evenly, and a narrower distribution should be utilized when there are large differences between the performances of the contestants.

2.7 Tournament theory

Evidence from tournament theory can be found in numerous situations in today's society. The basic idea of tournament theory is that participants compete for a prize that is awarded depending on a hierarchical ranking rather than the absolute output (Connelly et al., 2014). The prize that the participants compete for can be for example a higher salary for a certain position or prize money for winning a competition. Tournament theory have thereby been used to describe for example intrafirm competition and explain the increasing gap in pay between different workers positions (Connelly et al., 2014). Besides the fact that the prize awarded is based on ranking rather than absolute output, the fundamental concept of tournament theory is that the prize spread is significant between the different positions in the ranks (Lin et al., 2012).

A key idea is that there is a clear winner and loser in the end. If the prize spread is too narrow, it is believed that the participants incentive to perform decreases and thus the overall quality of the competition is reduced. It is therefore important for the organiser to determine the most optimal prize spread that will encourage maximal effort from all participants (Connelly et al., 2014). The willingness to compete is argued to be determined by the number of contestants in the tournament as well as the number of possible ranking levels.

When conducting studies of tournament theory researchers have divided the firms into non-high-tech firms and high-tech firms and they have found that the effects have been industry specific. The evidence from their research shows that tournament theory has a positive effect on non-high-tech firms (Lin et al., 2012). A large pay gap within firms that are in less need of strict coordination, often firms with low R&D, can give workers more incentives to provide greater effort and thus enhance firm performance. The phenomenon can be explained by the fact that larger pay gaps creates a motivation for the individual to put in more effort and furthermore a greater competition between management, and especially for higher ranked management positions (Lin et al., 2012). These firms are therefore encouraged to increase pay gaps to attain greater firm performance.

For high-tech firms on the other hand, studies show that large pay gaps might hinder the firm performance instead of enhancing it. A firm that is more high-tech, with for example big expenditures in R&D, demands more coordination and cooperation within the firm and between management teams. Thereby, an increased gap between different ranking positions might obstruct the willingness to collaborate and have a negative impact on the working atmosphere between these teams (Lin et al., 2012). Instead of creating competition that results in enhanced effort, these companies might be exposed to an unwillingness to share innovations and thus the

firm lose competitive advantages. High-tech businesses should therefore be careful if implementing tournament theory.

Studies of the management of tournament theory have furthermore found that the more influence that a higher hierarchy level has on the business, the greater was the pay gap between the different levels (Lin et al., 2012). The managers do however have a problem with incentivising the individual that are in the highest-ranking level. If there is no future advancement with higher pay, they need to be motivated in some other way (Connelly et al., 2014).

After reading the literature review there is no doubt that the management of sports faces difficulties implementing sustainable business models for their sport. The complexity of financial management within sports demonstrated in this literature review makes it interesting to look at correlations within the current financial situation within Formula 1. Are the financial incentives correlated with their performance? A hypothesis has therefore been created to study the historical financial data within Formula 1.

Hypothesis 1: There is a positive correlation between the amount of money distributed by FOM and the team's performance the coming year.

3. Methodology

This chapter presents the design of the multiple case study, gathering of empirical material and the methods used for analysing it. Moreover, the credibility and reliability of the thesis, in relation to the objectives, is discussed. The section is concluded with a discussion of the ethical considerations.

3.1 Research approach

With the specific aim of this thesis to investigate the management of Formula 1, the research in this thesis is conducted as a multiple case study based on multiple teams in Formula 1 over an extended period. The study is portraying the sport in great detail through investigating three teams in depth.

While conducting a multiple case study, this thesis is using a mixed method. This method is chosen because the author realises that it would be unrealistic to answer the research question by using a qualitative or a quantitative study alone. By using a mixed method, the aim is to set a foundation with a qualitative research based on an interview of a key individual in the sport. The discussions and problems found through the qualitative research will then be developed upon by a quantitative study. The quantitative research aims to describe the current relationship between financial contributions and final results and explore whether a correlation exists. To begin with a qualitative research approach is motivated by the fact that the sport is of such secretive nature that only an interview with a key individual will establish whether there is a problem within the management of the sport or not. Numbers will show if there is a correlation, whereas the interview aim to explain why certain patterns exists.

Even though the study is using mixed methods, the study does have more of an inductive approach. The process used starts with obtaining and observing empirical data, followed by forming categories and searching for patterns.

3.2 Collecting empirical data

There are two types of data used in the quantitative part of this study. The first type is the historical data concerning the constructors' results for the period studied in this thesis. The second type of data used is the financial payments attained by the teams from the FOM for each year. Any currency conversion from Euro to US Dollar is conducted with an exchange rate of 1 EUR = 1.157 USD and the exchange rate from British Pound used is 1 GBP = 1.33 USD. The converted number will be written within parenthesis in the text.

The sampling frame of this study are all the constructors that have participated throughout the entire period studied, that is 2014 through 2017. However, teams only participating in a few of the studied years are taken out of the analysis. They will remain in the data showcased in appendix II and III, but there is no validity to analyse the correlation between the money distributed by FIA and the performances of the team if they cannot be comparable with the other teams.

The empirical data concerning the performances of the teams during the studied years was collected from the database created by the Formula One Group. The database is an open archive that contains all Formula 1 Championship results since 1950 (FIA Archive, 2017). Furthermore, a similar database, Forix, created by Autosport which is an archive containing results and remarks from all previous grand prix is used (Forix, 2018).

The data concerning the prize money distribution from FOM is a bit trickier to get hold of. It would preferably have been collected from the original source, or FIA. But since they are difficult to collaborate with this study had to settle with secondary sources. The data was collected primarily from online sources like Autosport.

3.3 Interviews

Interviews are the most common method for gathering data within a qualitative study (Bryman and Bell, 2011) and because this study uses a mixed method, an interview was used to gather information and deepen the understanding of the subject.

The respondent is one of the team principals and therefore a key individual within the sport with insight in all that is happening in the sport. Thanks to his position he has knowledge both about how the economy within the sport as well as within several teams is. The interview was conducted through email conversations based on a standardised interview guide, shown in Appendix I. The interview was conducted with the aim to get a deeper understanding of the respondent's point of view.

3.4 Literature review

This study used a mixture of academic papers, articles and books to cover the theoretical framework of economics within sports. A vast number of articles have been read, focusing on the economic designs of sports and characteristics of good competition. The findings in the

literature review serve to compare the management within the Formula 1 to other competitive sports. Although many articles have been read, the author acknowledges that a longer time for the literature review could possibly have resulted in a broader study.

3.5 Analysing the data

The data was analysed by using both statistics as well as the interview and then put in relation to the literature review. The aim was to make an assessment of the money distributed by FOM and the performances of the teams the following year. Any correlation between the money distributed and the team's performance according to the qualitative study was compared and analysed in relation to the qualitative study conducted.

3.6 Validity, reliability, replicability, objectivity and causality

Validity, reliability and objectivity are three important criteria for valuation of the research design (Bryman and Bell, 2011). It is known that validity and reliability are of greater importance within quantitative studies than qualitative studies. Because this thesis is built on a mixed method, it is important that the research design meets all the criteria.

3.6.1 Validity

Validity, also known as construct validity, determines how well the results obtained from the measurements reflects the theories used as the basis for the study. The research can only be as good as the design used to conduct the research (Sekaran and Bougie, 2016). This is why it is imperative that good measurements are used where the validity can be reassured.

3.6.2 Reliability

The reliability concerns whether the measure is free from errors, and thus consistent over time. The reliability is therefore, in other words, a measurement of the "goodness" of the design and research (Sekaran and Bougie, 2016). This is an important criterion for the quantitative study to meet.

3.6.3 Replicability

Replicability is an important criterion for valuation where the study must be capable of replication by others. This is especially central for a quantitative study but for a qualitative study this will be difficult even if an ample questionnaire for the interviews are provided.

3.6.4 Objectivity

Objectivity is mostly concerning the qualitative part of the mixed method. When conducting interviews there is inevitably a risk of becoming biased, that answers will be analysed subjectively and thereby influence the results. This is of course problematic and something the author is aware of. However, because both an interview as well as a quantitative study was conducted to compare with, the author feels that the risk of affecting the objectivity is mitigated.

3.6.5 Causality

The connection between cause and effect is not always easy to analyse. The author realises in this case that other factors than those considered in the analysis can affect the outcome and tries to compensate this by elaborating all results in an extensive discussion. Money is not the only source of competitive advantage, but as it is an important part the author propose it is justified to focus specifically on this in the thesis as a pre-study for future research.

3.7 Research Ethics

Ethics is extremely important when conducting research and something that is especially central when conducting interviews. Because ethics is such a vital part of research many societies as well as universities has established codes of conduct and guidelines for researchers to follow. The Market Research Society, MRS, have ten principles that helps the researcher to protect the participants which the author aims to follow to the greatest extent (MRS, 2017).

It is important that the information gathered is based on voluntary consent and that the respondent is well aware of the purpose of the data collection for the study (MRS, 2017). This means that the researcher must be transparent and make sure that the respondent understands how the answers and empirical data will be used. Furthermore, the researcher must be honest and respect the respondent with confidentiality of the information. Individuals rights and well-being should always be protected, meaning that there should be no invasion of privacy, and the researcher shall make sure that not harm comes to any participants (MRS, 2017).

When it comes to the writing of the report there is a risk of deception if the author fails to depict what information are from an external source and what information is originated by the author. It is therefore important that the author keeps true to their own judgement and conducts the activities in a professional manner (MRS, 2017).

4. Empirics

The following section describes the empirical findings used for the analysis in this thesis. The interview with one of the team principals is presented, followed by an in-depth outline of three of the current Formula 1 teams as well as a summary of the remaining teams.

4.1 Interview

The discussion about the financial situation within the Formula 1 have been ongoing for many years, decades even. The overall picture in social media describes an uneven distribution of the funds and unrealistic financial challenges for the smaller teams to overcome. Caterham F1 Team as well as Manor F1 Team (previous Marussia F1 Team) all declared bankruptcy in recent years and the Formula 1 has experienced many more teams like BMW and Toyota leave the sport (Weaver, 2014). An interview made with one of the current team principals in Formula 1 confirms the problems depicted in social media.

When asked about his general view, as a team principal, of the current financial distribution system he makes it clear that the system is not fair. According to him, “a few teams get an unjustified high amount of money in comparison to the other competitors” which makes competition unfair. He argues that the current financial distribution system is “not sustainable for the business of Formula 1” and that “the new owners must think carefully to develop a system which gives all existing teams, and teams which are entering into the sport in the future a realistic chance to compete well and to survive”.

He describes the current situation in Formula 1 as a “two-class championship” where there are three teams far ahead (read: Mercedes, Ferrari and Red Bull) and the rest competing in the background, not standing a chance to catch up. The cost’s in Formula 1 has increased drastically compared to the start and he believes that “the sport has become too expensive, and that they spend too much money in Formula 1”. He urges FOM and FIA to find a way to reduce costs but he does not seem to mind whether this is being done by a budget cap or through “very strict and precisely defined regulations”. He believes that the choosing of solution is up to the responsible authorities.

He says that it “is unacceptable for his team to make a loss and that they would not be able to continue competing if they were to suffer a loss for a couple of years”. This seems to be true to all teams participating in Formula 1 but the team’s incentives to compete in the sport does not necessarily have to be the same. Some teams use Formula 1 as a means for marketing and

branding while he says that “others have targets like synergies between partnering teams or focuses on educating young drivers”. But with whatever target the team has, he argues that “successful competition is imperative and the only key to survive in this business”.

When asked about the future, he believes that they would all benefit from closer competition and if the teams were closer together it would increase the attention to Formula 1, which he finds is something that is necessary. “We need to provide the fans with a much more exciting show which clearly means that all the teams on the starting grid must be competitive, that there are interesting fights between the drivers resulting in overtaking manoeuvres. The fans at the grandstands or in front of the TV want to be entertained”.

He believes that Formula 1 has the possibility to realise the requests stated above and he furthermore states that “if Formula 1 would have more predictable costs and a more even distribution of the prize money, then management boards of different manufacturers would consider taking part in F1, making it an even bigger sport”.

Table 1. Key points from the interview

Current situation	Uneven financial distribution, some teams receive an unjustified high amount of money Unrealistic chance for smaller teams to compete Extreme financial circumstances, the sport is too expensive F1 have a two-class championship due to the financial situation
Performance parameters	There are three key parameters to improve performance: <ul style="list-style-type: none"> - The number of, and skill, of engineers - Investment in infrastructure - Investment in research and development
Incentives to compete	The incentives are different for all teams Successful competition is imperative for all teams
Future goal	Attractive and exciting sport, i.e. close competition A financial distribution system that gives an opportunity for close competition Entry of new manufacturers

4.2 Ferrari

<u>General information</u>		<u>Financial information</u>		2017 (since 2016)
Full name:	Scuderia Ferrari	Net revenue:	€ 3417 M	(up 10%)
Start in Formula 1:	1950		(\$3953 M)	
Origin:	Maranello, Italy	Net profit:	€ 537 M	(up 26,4%)
Type of team:	Manufacturing team		(\$621 M)	
Drivers:	Sebastian Vettel, Kimi Räikkönen	Sponsorship,		
World Championships:	16	commercial and brand:	€ 494 M	(up 1,1%)
Pole Positions:	206		(\$571 M)	
Fastest Laps	243			

References: (Ferrari^f, 2017; Formula 1 Team, 2017)

4.2.1 History

With a mission to “make the world dream” (Ferrari^c, 2018) Ferrari is among the world’s top luxury brands on the market. It is a brand that is recognised by almost everyone, car enthusiast or not, and their brand image is to a large extent dependant on their success within Formula 1 (Ferrari^d, 2015). They have participated in more than 900 grand prix and they are still the only constructor that have entered in every single Formula 1 Championship since the start in 1950 (Ferrari^b, 2018).

Ferrari have their production facilities and headquarters in Maranello, Italy, where the production employs over 1350 people, and they had a total of 3380 employees in the end of 2017 (Ferrari^f, 2017). Many other teams form close relationships with manufacturers and thereby buy engines and other parts from them (Autoracing, 2018). However, Ferrari are like Mercedes and Renault a manufacturing team, which means that they manufacture their Formula 1 racing car, including the engine, completely on their own. This type of business is a big income source for Ferrari since the engines can cost around \$20 million annually (Autoweek, 2015), and for the 2018 Championship both Haas F1 Team and Sauber F1 Team are buying their engine from Ferrari (Ferrari^f, 2017).

Because Ferrari has been part of the sport for so long they have several advantages compared to the other teams. One of the biggest advantages is their veto. This influence allows them to stop changes that the governing body FIA wants to implement which is an extreme advantage. The FIA has however said that Ferrari are only allowed to veto if the changes in the regulations means that Ferrari must modify their car completely (Autoweek, 2015). Another advantage they have is the financial bonuses they receive each year. One bonus is for being the only team that

has participated in every race since the start in 1950, referred to as the “LST” (Long-Standing Team) bonus. This bonus is set to be approximately 5% of F1’s total revenues which in 2016 meant that Ferrari received a bonus of \$70 million. They also get a constructor’s championship bonus along with Mercedes, Red Bull and McLaren which derives from a separate agreement with the FIA (Autosport, 2016). In addition to these bonuses they furthermore get funds for participating and funds based on last year’s performance (column 1 and 2, Appendix II), just like all other team do (Autosport, 2015;2016;2017).

Adding up all the payments Ferrari received for 2017 result in \$180 million in total. This is almost one fifth of the total funds, and even though Mercedes won both the constructor’s and driver’s championship the previous year, Ferrari still received \$9 million more than Mercedes. Comparing Ferrari’s funds (\$180m) to Force India (\$72), they get \$108m more even though Force India only finished one place behind Ferrari (Autosport, 2017). Below is a summary of Ferraris payments form FOM during the years 2015, 2016 and 2017.

Table 2. Summary of Ferrari’s payments from FOM

Ground pay			Performance pay			LST			CCB			Total		
2014	2016	2017	2014	2016	2017	2014	2016	2017	2014	2016	2017	2014	2016	2017
31	33,5	36	36	53,5	41	63	70	68	34	35	35	164	192	180

In million \$

Ground pay = Payments are based a team's classification over two of the past three years

Performance pay = Payments are based solely on a team's classification the previous year

LST = Long-standing team

CCB = Constructors' championship bonus

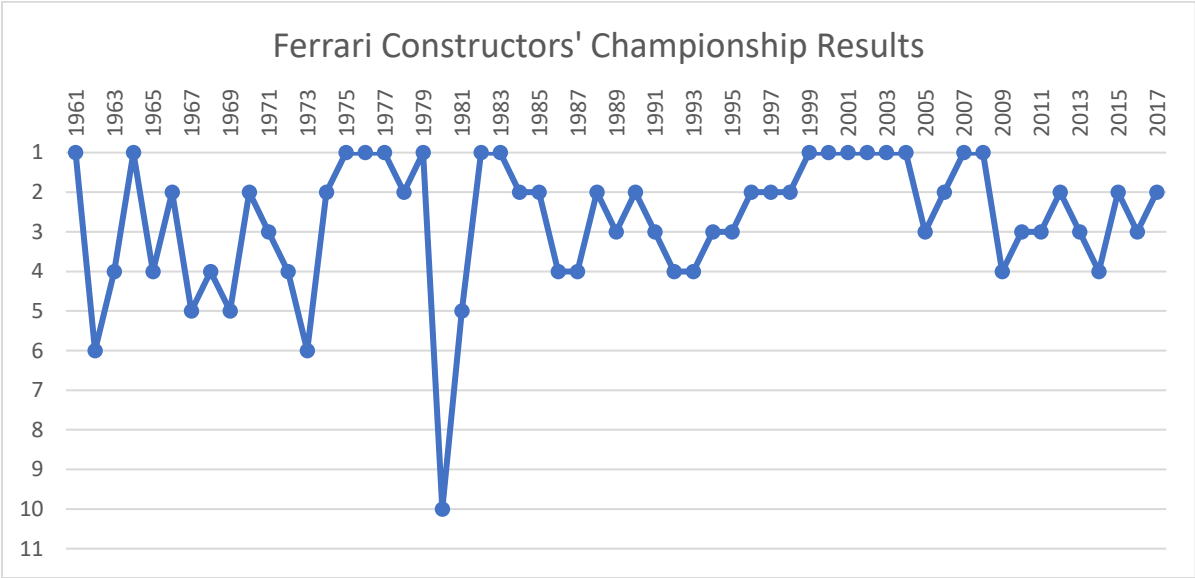
Source: Autosport, 2015;2016;2017.

4.2.2 Sporting performance

Ferrari has been part of Formula 1 since the start in 1950 and has since then competed in over 900 grand prix, collected 16 Constructors’ World titles and 15 Drivers’ World titles (Ferrari^c, 2018). Their first Constructors’ championship victory was in 1961 with a follow up in 1964. After that it took ten years for them to win the title again in 1975, which was the beginning of a good era. Over the following five years they won the championship title four times, the last one in 1979. Ferrari has certainly been one of the most successful teams in Formula 1 history. The only real setback was in 1980. Although the car was built on the car from the previous year, with which they won the Constructors’ World Championship, it was completely undrivable. It

was incomprehensively difficult to drive and extremely uncompetitive which meant that Ferrari did not win a single race that season (Ferrari^s, 2018). They managed to turn things around and won the championship title two more times, the last one in 1983. After that, things began to work against them and it took until 1999 for them to win again. However, during 1999-2004 they were invincible, and they would win the constructors' title two times more, in 2007 and 2008, which was the last time.

Graph 1. Ferrari Constructors' championship results



Source: Forix autosport+, 2018; Formula 1 Results, 2018.

4.2.3 Financial performance

Since Ferrari is a manufacturing team with quite a lot of power within Formula 1 there are no records of them having financial issues like other teams have had. It is extremely difficult to calculate the budgets for the different teams as they can fund their operations in numerous ways. It is especially hard to do with Ferrari since they have their entire production within the Ferrari corporation and thus do not have to file publicly available financial records of the team. However, it is known that apart from being funded by Ferrari themselves, they also receive funds from selling engines to other teams, as they are a manufacturing team, from the bonuses and pay-outs from the FOM, from their parent company and from multiple sponsors as well as partners (F1 technical, 2017; Reddit, 2017; Forbes, 2017). As discussed above, Ferrari received

approximately \$180 Million from the FOM in 2017 but rumours say that their total budget when sponsors and partnerships are included can be up to \$580 million (F1 technical, 2017; Reddit, 2017).

Since the Formula 1 Championship is the highest motorsport series in the world with 350 million viewers in 2017 it is an important platform for Ferrari to be part of. Ferrari's Formula 1 Team is a core element for their marketing as well as a source of technological innovation within their production, engineering and development of their sports cars (Ferrari^f, 2017). This essentially means that most of Ferrari's R&D costs goes to their Formula 1 team, which they then also use in their commercial cars (Ferrari^{d-f}, 2015-2017).

Table 3. Ferrari R&D costs

	During the period				
	2013	2014	2015	2016	2017
Research and development costs expensed	€358,850 (\$412,680)	€415,336 (\$477,636)	€446,726 (\$513,735)	€509,58 (\$586,017)	€556,617 (\$640,109)

Note: £000

4.3 Red Bull Racing

General information

Full name:	Aston Martin Red Bull Racing
Start in Formula 1:	1997
Origin:	Milton Keynes, United Kingdom
Type of team:	Non-manufacturing team
Drivers:	Daniel Ricciardo, Max Verstappen
World Championships:	4
Pole Positions:	58
Fastest Laps	54

Financial information 2016 (since 2015)

Net revenue:	£ 197,9 M (up 9%) (\$263,2 M)
Net profit:	£ 0,385 M (down) (\$0,512 M)
Sponsorship, commercial and brand:	£ 40,6 M (\$53.9 M)

Note: profit down from £ 2,141 M (2015) due to an £4 M interim dividend payed

References: (Red Bull^o, 2016; Formula 1 Team, 2017)

4.3.1 History

Red Bull racing team is compared to Ferrari a new team in Formula 1. They had their first start as "Red Bull Racing" in 2005 after they bought the Jaguar F1 Team from the Ford motor company at the end of 2004 and rebranded it to Red Bull. The teams' origin can however be traced back to the Stewart Grand Prix which was a Formula 1 team that made its debut in 1997 and later bought by Ford motor company (BBC, 2004).

Red bull Racing is one of two teams in Formula 1 owned by the energy drink company Red Bull GmbH. The other team, Scuderia Toro Rosso, functions as a junior team for Red Bull Racing. This collaboration is unique within Formula 1 although there are collaborations between other teams as well. Since the rules in Formula 1 prohibits teams from using for example the same chassis as well as other specifications, the two teams operate as two separate teams but there is no doubt that the collaboration is vast (Scuderia Toro Rosso, 2018).

Red Bull racing limited only employed 58 people in 2016 (Red Bull^e, 2016) which is equivalent to a racing team. It is however a subsidiary, Red Bull Technology, which employs the designers and engineers that develops and produces the car (Autosport, 2010). When Red Bull and Toro Rosso entered into Formula 1 they both used cars built by Red Bull Technology but as objections to their close collaboration started to rise Toro Rosso opened to produce their cars inhouse instead (Autosport, 2011).

Looking at the payments Red Bull receives from FOM in table 4, they have, similar to the agreements with Ferrari, a few extra bonuses. Column 1 and 2 are like all other teams' dependant on their participation (ground pay) and performance (performance pay) but what separates Red Bull from the other small teams is the column "other". Red Bull receives, as mentioned in the Ferrari section, a constructor's championship bonus along with Mercedes, Ferrari and McLaren because of their separate agreement with the FIA (Autosport, 2016). But they also receive a payment of \$35m each year for being the first team to sign the current bilateral agreement in 2012 which is set as a framework for the governance of Formula 1 until the end of 2020 (Autosport, 2015;2016;2017). This means that the cumulative bonuses reach a total of \$74m each year since 2012. Below is a summary of Red Bull's payments form FOM during the years 2015, 2016 and 2017.

Table 4. Summary of Red Bull's payments from FOM

Ground pay			Performance pay			Other			Total		
2014	2016	2017	2014	2016	2017	2014	2016	2017	2014	2016	2017
31	33,5	36	51	36,5	52	74	74	74	156	144	161

In million \$

Ground pay = Payments are based a team's classification over two of the past three years

Performance pay = Payments are based solely on a team's classification the previous year

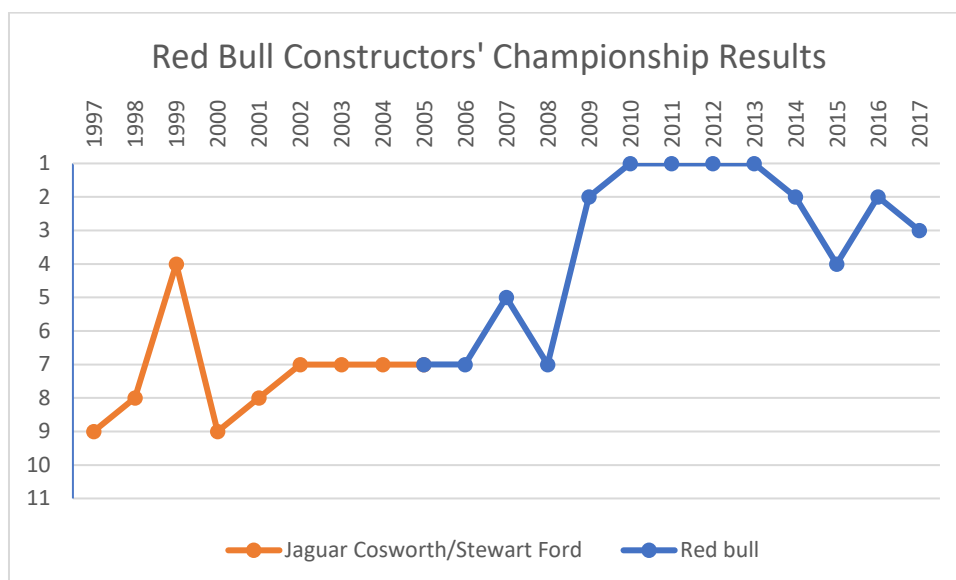
Other = \$35m for being the first team to sign the current team agreement + (CCB) Constructors' championship bonus

Source: Autosport, 2015;2016;2017.

4.3.2 Sporting performance

Red Bull racing had their first official race in 2005 after acquiring Jaguar racing limited (former Stewart Grand Prix Limited 1995-2000) in 2004. The acquisition proved successful as the team scored more points during the first races than Jaguar could during their entire season the previous year (Formula 1 Teams, 2017). It took however a few struggling years with their junior team putting heavy pressure on them before everything started to work smoothly in 2009. Half season through they were completely dominating the series and finished second that year only to improve the performance the coming years. Over the years 2010 to 2013 Red Bull Racing are dominating the series with their superior aerodynamics, taking four consecutive Constructors' Championships. But after 2013 problems with their power units and with the Renault engine results in an uncompetitive car leaving them fourth in the championship in 2015, their worst ranking since 2008. However, with an improved engine to the coming year, and an extremely efficient chassis built by the team, they manage to bounce back in 2016 and finishes the season as runner up (Formula 1 Teams, 2017). There is no doubt that since the team acquired Jaguar, they are extremely determined to be one of the top three teams in the series with their junior team, Toro Rosso, educating young talented drivers to become world champions later on in Red Bull.

Graph 2. Red Bull Constructors' championship results



Source: Forix autosport+, 2018; Formula 1 Results, 2018.

4.3.3 Financial performance

Like Ferrari who, to a vast extent, receives funds from its core business (sports car manufacturer), Red Bull Racing also has a large, secure company backing them. As mentioned above, they are owned by the energy drink company Red Bull GmbH and was thus from the start financed by drink sales and the owner Dietrich Mateschitz (Red Bull, 2018). Nowadays however they largely rely on extensive partnerships and big sponsors. Infiniti was for example an important partnership for many years where they received big funds (Red Bull^b, 2013).

The core activity of the company, Red Bull Racing Limited, is the management of the Formula 1 racing team Red Bull. This means that all the financial contribution that comes in to the company is spent directly on their race program. To evaluate their progress towards their strategic goals they use championship performance, race performance and costs base as key performance indicators (Red Bull^a, 2012). Red Bull had in 2016 a turnover of £197,949,000 (\$263 272 170) which is an increase of £16,520,000 (\$21 971 600) from the year before. According to their annual report in 2016, the increase mainly comes from higher performance bonuses as they improved their position from 4th to 2nd in 2016 (Red Bull^e, 2016). Their turnover originates from prize money, bonus payments, sponsorship and promotional income (Red Bull^a, 2012).

They state in their annual report that the main risk is that the level of financial contributions that they receive would decrease if their performance deteriorates. The financial means are to a large extent dependent on the racing performance of the company which has been strong in recent years, and a period of unsatisfying results would have a negative impact on the team (Red Bull^e, 2016). As the partnership with the luxury brand Infiniti ended in 2015 the parent company Red Bull GmbH invested four times more in 2016 than in 2015 (Forbes RB, 2017). The investment increased from £10,136,000 (\$13 480 880) to £40,607,000 (\$54 007 310) which is their biggest investment since 2012 (Red Bull^{a,e}, 2012;2016).

One should however practice great care when comparing the financial situation of Red Bull to other teams like Ferrari since the company Red Bull Racing only employs 58 people, i.e. the racing team. The production and engineering is conducted by the parent company Red Bull Technology which also supplies the junior team Toro Rosso (Motorsport, 2017; Red Bull^e, 2016).

Table 5. Red Bull results of Formula 1 activities

	2011	2012	2013	2014	2015	2016
Turnover	£176,844 (\$235,202)	£176,310 (\$234,492)	£197,599 (\$262,806)	£204,637 (\$272,167)	£181,429 (\$241,300)	£197,949 (\$263,272)
Net profit on ordinary activities after taxation	£641 (\$852)	£700 (\$931)	£1,042 (\$1,386)	£539 (\$717)	£2,141 (\$2,847)	£385 (\$512)

Notes: £000

Turnover: Represents prize money, bonus payments, sponsorship and promotional income, contributions towards the race programme received and receivable net of value added tax. (Red bull, 2012-2016)

4.4 Williams

General information

Full name:	Williams Martini Racing
Start in Formula 1:	1978
Origin:	Grove, United Kingdom
Type of team:	Non-manufacturing team
Drivers:	Lance Stroll, Sergey Sirotkin
World Championships:	9
Pole Positions:	128
Fastest Laps	133

Financial information 2016 (since 2015)

Net revenue:	£ 167,41 M (up 33%) (\$ 222,65 M)
Net profit:	£ 5,9 M (loss previous year) (\$ 7,8 M)
Sponsorship, commercial and brand:	£ 116,69 M (up 14%) (\$ 155,19 M)

References: (Williams^h, 2016; Formula 1 Team, 2017)

4.4.1 History

Founded in 1977 by Frank Williams and Patrick Head, Williams Grand Prix Engineering Ltd (now Williams Martini racing) is one of the longest standing teams participating in Formula 1 (Williams^a, 2018). Although entering as a new team in the sport the car was considered competitive, finishing 9th out of 14 teams in their first season in 1987. Taking staff from teams that were closing, Williams F1 team grew from 17 people to 50 (Williams^b, 2018), and they finished 2nd in the Constructors' Championship the coming year (Formula 1 results, 2018). The team has now grown into a company with over 600 employees working at their technology centre in Oxfordshire (Williams^c, 2018).

During their many years in Formula 1, Williams F1 team have fostered many great talents and is recognised as one of the most successful and durable teams in sport. The team's

accomplishments have earned the founder and owner, Frank Williams, a knighthood as well as the Légion d'honneur, which is the French equivalent (Williams^c, 2018).

Unlike Ferrari and Red Bull Racing which to a large extent uses Formula 1 as a marketing tool for their primary businesses (selling cars in Ferraris case and energy drinks in Red Bulls case), Williams is one of the teams that has no other purpose than to race. It is a completely independent team that funds its business through prize money, sponsorships and partnerships (Williams^c, 2018). Apart from the pay-out for participation and performance (column 1 and 2 in Table 6), Williams also receive a bonus pay-out of \$10 million which is considered a heritage bonus. Williams is the only team receiving this pay-out, but it is not nearly as big as the bonus Ferrari receives. A strong partnership is therefore especially important according to the team to gain financial stability, and for the past four years Martini Racing, owned by the Bacardi group, have been their title sponsors (Motorsport Martini, 2014). Their collaboration is however rumoured to end after the 2018 season. Considering Martini as a well-known alcohol drink, questions have been raised whether there is a problem that both Williams drivers are under the age of 25. However, according to the Bacardi group they have chosen to end all participating in Formula 1 due to changed strategic objectives on their part (Autosport Williams, 2018). It is however crucial for a team like Williams to find new sponsors to fill the financial gap that would be if a sponsor leaves because as the table below indicates, they are unable to finance their complete operations solely on payments from FOM.

Table 6. Summary of Williams' payments from FOM

Ground pay			Performance pay			Other			Total		
2014	2016	2017	2014	2016	2017	2014	2016	2017	2014	2016	2017
31	33,5	36	42	43,5	33	10	10	10	83	87	79

In million \$

Ground pay = Payments are based a team's classification over two of the past three years

Performance pay = Payments are based solely on a team's classification the previous year

Other = A heritage bonus payed only to Williams Martini Racing

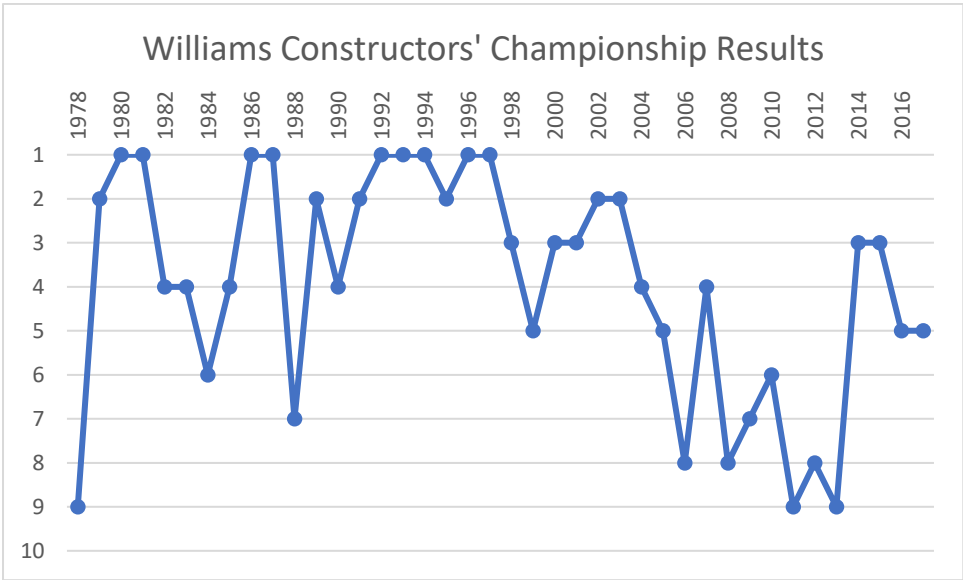
Source: Autosport, 2015;2016;2017.

4.4.2 Sporting performance

Williams is one of the teams that have been longest in Formula 1. Although facing a tough start in their first season finishing 9th the teams' commitment is rewarded only two years later when they win their first Constructors Championship after dominating in 1980 (Williams^a, 2018).

However, as other teams move forward with innovation, for example turbo engines, Williams struggles for a few years, dropping back to 7th place in 1988. They fought themselves back and was again on top in 1986 and 1987, winning their third and fourth title (Formula 1 Teams, 2017). Their performance alters in 1988 because of a weaker engine that year as they wait for a Renault engine to come in 1989. It does however take a few years to win the Championship again due to lack of engine power as well as reliability issues (Williams^a, 2018). Being the runner up in 1991 was however a great start to a very successful era for the team. Winning five titles in six years (1992-1994 and 1996-1997) is an incredible success, but with Renault pulling out of Formula 1 in 1998, leaving Williams to change engine supplier. Williams struggles with being as competitive in the coming years. Although still winning races during the years 2000-2004, they are still well distanced by the top team Ferrari and because of poor reliability and failure to innovate the following years were the worst in terms of results for the team. Finishing 9th in both 2011 and 2013. The team bounces back in 2014 and 2015 with a better engine and two persistent drivers, finishing third with a bit of bad luck hindering them from a better position. After that, the team is unable to maximise its performance and does not seem to be as competitive as in their old days (Williams^a, 2018).

Graph 3. Williams constructors' championship results



Source: Forix autosport+, 2018; Formula 1 Results, 2018.

4.4.3 Financial performance

Williams is by far the most open team within Formula 1 when it comes to financial reports, at least from the past decade. Their financial reports are published with full disclosure on their website and they speak quite openly about the financial situation in Formula 1. Williams has an extremely successful history within the sport, but as the cost to compete within Formula 1 increased heavily during the past decade the team has struggled both with their finances and performance since around 2008 (NGM, 2016).

Looking into the past six years it is clear that while the biggest teams invests more money and increases their budgets, Williams has had a hard time to follow. After 2011, when the Group made a profit of £7.8 million (\$10,4 M), their financial statements has shifted back and forth from profit to major losses (Williams^d, 2012). Looking at Williams Formula 1 activities they made a loss of £8.2 million (\$10,9 M) in 2012 followed by a profit of £11.7 million (\$15,5 M) in 2013 and then a staggering £33.7 million (\$44,8 M) loss in 2014 after losing sponsorships, poor track performance, and a significant increase in costs following changes in the Formula 1 regulations (JA, 2015; Williams^f, 2014). They had furthermore invested significantly in new talent and facilities in 2013 and coming in to 2014 which largely improved their performance enabling them to obtain third place in the constructors championship (Williams^{e,f}, 2013;2014). Because of their new strategic investments and improved position, the EBITDA for 2015 improved to a loss of £3.8 million (\$5,05M) instead of £33.7 million (\$44,8 M) loss the previous year, proving that the new strategy was working well (Williams^g, 2015; Autosport Williams, 2016). The results continued to improve in 2016 when their Formula 1 activities showed a profit of £9 million (\$11,9 M) (Williams^h, 2016).

Table 7. Williams results of Formula 1 activities

	2012	2013	2014	2015	2016
Net (loss)/profit on ordinary activities before taxation	£(8,223,017) (\$ (10,936,612))	£11,670,311 (\$15,521,13)	£(33,768,000) (\$ (44,768,000))	£(3,843,000) (\$5,111,190)	£9,083,000 (\$12,080,390)

Reference: Williams^{d-h}, 2012-2016

4.5 Remaining teams

Apart from Ferrari, Red Bull and Williams there were seven more teams on the starting grid in 2017. As mentioned previously, the Formula 1 starting grid is sometimes referred to as a “two-class championship where Mercedes Ferrari and Red Bull are the top teams competing out of reach from the other seven teams. This is quite clear looking at the points collected during for example the season in 2017. Putting Force India aside, who had a fantastic season despite being one of the smaller teams, there is a 285-point gap between Red Bull (368p) and Williams (83p) which is more points than the last six teams (Williams to Sauber) collected all together during that year (Formula 1 Results, 2017).

Table 8. Formula 1 points in 2017

Position	Team	Points
1	Mercedes	668
2	Ferrari	522
3	Red Bull	368
4	Force India	187
5	Williams	83
6	Renault	57
7	Toro Rosso	53
8	Haas	47
9	McLaren Honda	30
10	Sauber	5

Source: Formula 1 Results, 2017

The Constructor’s championship results have however changed a lot over the years. Ferrari is the team with the most consecutive constructor’s championship titles when they won six years in a row from 1999-2004. Mercedes, Red Bull and McLaren are all runner up as they have all won four years in a row (Formula 1 Results, 2018). Appendix III shows a graph of the constructor’s championship results over the past 18 years and quite clearly shows the difficulties with maintaining a good result the following year. The most successful team for the past two decades is Ferrari. They have during these years managed to maintain a consistent position within the top four teams. Looking into teams like Renault, Williams, McLaren and Sauber on the other hand they all have jumped up and down from year to year. McLaren have for example been the runner up no less than six times during these years, but they have also finished in 9th position two times and was last (11th) in 2007 (Formula 1 Results, 2018). Sauber, although they are one of the teams with most experience within Formula 1, has been competing

with the bottom five for most of the past 18 years but with two good years in 2007 and 2008 finishing 2nd and 3rd they too have been at the top.

The graph in Appendix III shows how hard it is for a team that enters Formula 1 to continue with the sport if they fail to perform the first couple of years. Caterham and Marussia (subsequently Manor Formula 1 Team) are two examples of this. Because of their poor performance they receive very little prize money compared to the other teams and have to rely on other sources of income such as owners, sponsors and partners (Autosport, 2014).

4.6 Team Payments

From a financial point of view, the three top teams (Mercedes, Ferrari and Red Bull) do not seem to have any financial difficulties whereas voices have been raised from other teams (Bleacherreport, 2016). The three top teams are all backed by strong corporations with other objectives than only driving in Formula 1, for example manufacturing cars or producing energy drinks, and is therefore not as dependant on sponsorships. It is known that Formula 1 is an extremely competitive and expensive sport and several teams have declared bankruptcy in the past. Caterham went bankrupt in 2014 after years of financial difficulties and Marussia went into administration only four days after (Autoweek, 2014). Marussia did however come out of administration and continued to compete rebranded as Manor F1 Team until 2016 (ESPN, 2017).

Nowadays, it is Sauber and Force India as well as Williams that are the most struggling teams on the grid. Sauber for example have complained multiple times in media over the past couple of years that there is no fair fight within Formula 1 due to the financial difficulties (Autoblog, 2016; thisisf1, 2016). Sauber F1 team has had issues leading up to late staff payments in 2016 as well as dropped update-packages to the cars resulting in bad performance and results (Autosport delays, 2016).

Two teams, Sauber and Force India, have openly complained about the costs of the sport and the uneven financial distribution. The continuously uneven distribution of the prize money within Formula 1 made them lodge an official complaint to be investigated by the European Union in 2015. With the complaint they question the governance of the Formula 1 and indict the rules to be unfair and unlawful (ESPN, 2015). However, the complaint was filed in 2015, before the Formula 1 was acquired by Liberty Media, and since then all parties has begun discussing the structure of the sport. In a joint statement, Sauber and Force India declared in January 2018 that they withdraw their EU complaint effective immediately. They say that the

approach of the new owners, encouraging dialogue and transparency in all financial matters, has reassured them that the problems are taken seriously and are being dealt with inhouse. Because of this attitude both teams feel confident that a solution can be met and hence withdraws their complaint to support the transformation that the new owners would like to implement (Formula 1 statement, 2018).

The payments distributed by the FOM to each team within Formula 1 is a complicated process with revenue streams coming from multiple sources. The funds are allocated through nine pay-outs spread out over the season. (Autosport payment, 2016) Appendix II shows how the payments were distributed to the different teams for 2015, 2016 and 2017. Column 1 is a pay-out that all teams that have participated for at least two of the past three years receives. It is allocated equally to all teams. Column 2 is the only column that the teams have any power to increase from year to year. It is dependent on the result in the constructor's championship from the previous year. This means that the previous winner obtains the most and the last team receives the least from the amount that is allocated from this column (Autosport payment, 2016). However, apart from these two payments there are multiple bonuses that goes only to certain teams, shown in column 3 and 4. Ferrari gets a bonus for being the only team that has participated in every race since the start in 1950. This is referred to as the Long-Standing Team bonus (LST), and it is set to be approximately 5% of F1's total revenues. Furthermore, Ferrari also receives a constructor's championship bonus along with Mercedes, Red Bull and McLaren which derives from a separate agreement with the FIA. Lastly, Williams receive a heritage bonus of \$10 million (Autosport, 2016). This allocation essentially means that after all pay-outs are completed it can be a difference of \$145 million between the best payed and the worst (Autosport payment, 2016).

5. Discussion

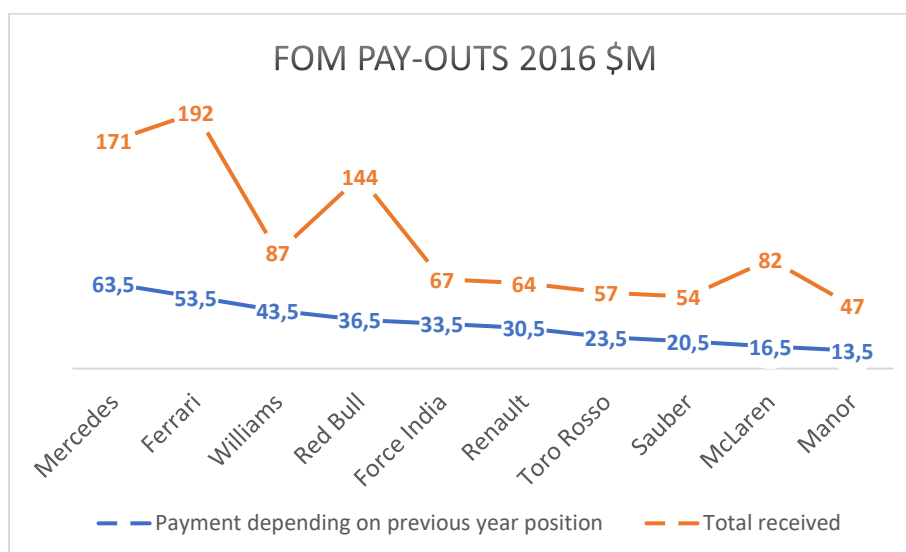
This chapter aims to discuss the research question; To what extent is the prize money distributed by FOM affecting the teams and their performance? It will do so by assessing the financial distribution within Formula 1 in relation to the literature review and the empirics gathered. It will furthermore confer consequences of more intense competition and concludes with a discussion of sports management and the tournament theory applied in Formula 1.

5.1 Assessment of the prize money distribution

According to the interview conducted in this thesis as well as the empirical data gathered, there is a big difference between the highest paid team and the lowest paid team within Formula 1. The team principal argued that some teams get an “unjustified high amount of money compared to other competitors” and Appendix II shows us evidence of this. Looking at the total amount received from the FOM, the gap was as big as \$145 million between what Ferrari (\$192m) received and what Manor (\$47m) received in 2016. Comparing the numbers between the different teams in Appendix II it certainly confirms the unfair situation depicted by the team principal. What is interesting with this is that if we only look at the pay-outs depending on previous year’s performance, which is the blue line in graph 4, the difference is not nearly as big. The difference is merely \$40m between the two teams (Ferrari and Manor) after the pay-out distributed from this pay-out source.

Graph 4 below shows the pay-outs made from FOM to all different teams participating in 2016. The blue line and numbers describes the payments made depending on performance while the orange line and numbers summarise the total pay-outs distributed to the teams.

Graph 4. FOM pay-outs 2016

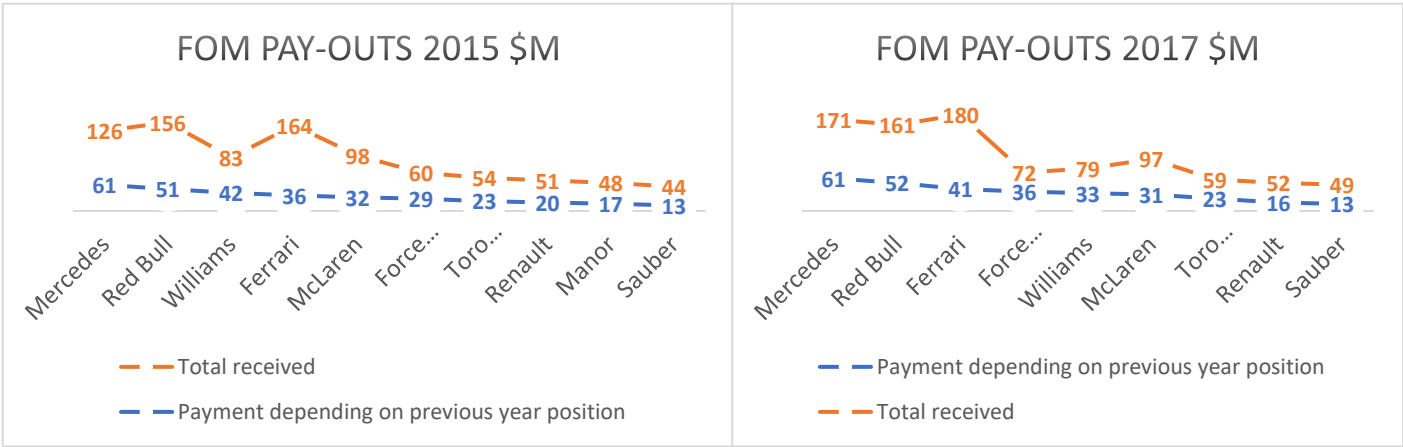


As the graph is filtered according to the blue line, which is dependent on the teams' performance from the previous year, the teams in the graph are all ranked from winner to the left to loser to the right. What is interesting with this is that even though Mercedes won the constructors championship the previous year, and therefore obtained the biggest fund from the performance pay (blue), they still received less than Ferrari in the end (\$171m to \$192m) due to the bonus system. The same phenomena apply to Williams who outscored Red Bull in 2015, and therefore obtained more money from the performance pay, but still received \$57 million less in the end. Additionally, Force India, Toro Rosso and Sauber were also subjects to this phenomenon as they all outscored McLaren, but they all received less in the end.

The same phenomena are found when looking at the pay-outs in both 2015 as well as 2017. In 2014, Ferrari finished in fourth position in the constructor's championship but because they receive the largest amount of bonuses they still obtained the most money in 2015 and the same phenomena can be found in 2017 for both Ferrari, Williams and McLaren.

Graph 5. FOM pay-outs 2015

Graph 6. FOM pay-outs 2017



Focusing again at 2016, and looking at the financial distribution from another perspective, table 9 shows that Ferrari, Mercedes and Red Bull all receives more funding from only their additional bonuses than Force India, Renault, Toro Rosso and Sauber each receive in total. This means that the incentives created by the financial distribution from the blue line, which is based on tournament theory, is completely out of play after every pay-out is considered. This implication will be developed upon in chapter 5.2.

Table 9. Bonus pay-outs and Total payment, 2016

Bonus pay-outs in 2016 \$m		Total payments in 2016 \$m	
Ferrari	105	Force India	67
Mercedes	74	Renault	64
Red Bull	74	Toro Rosso	57
		Sauber	54
		Manor	47

To analyse the financial situation and compare the performance pay-out to the total money received, two correlation analyses are conducted. The first one analyses possible correlation between the money received by the teams from the performance pay and the position they have at the end of that year. When tournament theory is applied, as it is in the performance pay, the best team from the previous year get the most money while the last team receives the least amount. It is therefore likely that the winning team maintains their position and wins the coming year as well. Looking at the correlation analysis there is a strong negative correlation between the amount of money received from column 2 and their position in the end of the year. This essentially means that more money gives a lower score for position and since number 1 is the winner and number 2 is the runner up and so forth this is completely in line with the above hypothesis.

Table 10. Correlation for the years 2015-2017

	Money from the performance pay	Position end of the year
Money from the performance pay	1	
Position end of the year	-0,779107	1

P-value: 1,68627E-06. Since it is lower than $\alpha=0,5$ the correlation is statistically significant.

Further analysis shows that there is less correlation between the total money received and the obtained position at the end of the year than the above correlation with the money from the performance pay. The correlation still shows that there is a significant negative relationship, meaning that more money is correlated to better position, but it is not as strong. This implies

that the tournament theory affected and that there are other factors like the bonuses that alters the correlation.

Table 11. Correlation for the years 2015-2017

	<i>total money</i>	<i>Position end of the year</i>
total money	1	
Position end of the year	-0,739198	1

P-value: 1,06069E-05. Since it is lower than alpha=0,5 the correlation is statistically significant

With this financial situation in mind, the interviewed team principal pointed out that new teams entering the sport face an unrealistic challenge to compete well and essentially survive in the sport. This can be illustrated by looking at the new entrants HAAS (Appendix II) who do not receive any funding from the ground payment (column 1) for yet another year since they must complete two for the past three years as constructors in the sport before being eligible funding from the ground payment. Thus, although positioning themselves as 8th in 2016 they did not receive any funding until 2017, and even then, they only received \$19m from the performance pay. This means that they must fund their participation completely on their own through their owners, sponsorships and partners.

However, to think that the pay-outs from FOM to the teams equals the teams total budget is a complete misconception. Rumours in several newspapers say that the teams total budget can be as big as \$580 million for a big team like Ferrari and \$220 million for a smaller but financial stable team like Williams. For the smallest teams like Sauber the budget is rumoured to be as small as \$105 million (Reddit, 2017). It is important to know that these are not confirmed numbers but it still gives a pointer to how much money a small and new team must collect to be competitive in the sport. It furthermore comes as no surprise that teams face a big risk of going into administration as the racing success and following sponsorships is imperative for a team’s survival.

From the perspective of the teams, the interview shows that it is preferable that the responsible authorities are the ones choosing a solution to the prize money distribution without any direct involvement from the teams. There are however certain solutions discussed more than others. One of the solutions that the interviewed team principal discussed was a budget cap or a very

strict and precisely defined regulation. It is possible to find examples of the latter in for example smaller series like Formula 3 or in Swedish STCC. However, a standardised package would without a doubt hinder the innovation that the sport is constantly striving for.

5.2 Consequences of more intense competition

As Formula 1 is a sport that strives to be the biggest and most technically advanced motorsport in the world it is no secret that they constantly strive for new innovations to come forward. This is from the Formula 1 managements perspective achieved through regulation changes. This innovative nature of the sport does however have consequences for the teams participating as they constantly have to alter their cars to take maximal advantage of the existing rules at the same time as finding new solutions as the rules change from one season to another. Furthermore, as the management of Formula 1 aims to intensify competition, this becomes even harder for the incumbent firms.

Researches have in many studies found that disruptive innovation is most likely to be created by a new entrant than by an incumbent firm. This is understood to be because the incumbent firms are reluctant to change their ways and thus lose their competitive advantages (Jenkins, 2010). However, Jenkins (2010) concluded in his study of the Formula 1 motor racing that this in many cases were untrue to the teams participating. Ferrari for example have been one of the top teams from the start in 1950 and Williams founded in 1977 have also managed to adapt and outscore new entrants coming in to the sport. To anticipate trajectories is believed to be one of the main reasons that incumbent firms manages to stay competitive in this innovative and highly competitive atmosphere (Jenkins, 2010). There is a constant threat of new entrants coming in to the sport which might make the teams try even harder to stay innovative. This is of course as mentioned above a great thing for the sport since its aim is to be the most technically advanced motorsport in the world.

As Martin-de Castro (2015) points out in his study, to produce continuous technological innovations is one of the core attributes the firm must possess for a firm in this type of high-tech industry. Firms need to constantly come up with new innovations to stay one step ahead. However, as Boon (2001) argues, the incentives to innovate can play out different in different contexts and it is imperative that the Formula 1 manages to balance this to enhance competition at the same time. Due to Formula 1 being such a complex sport, there is no surprise that one team dominates one era of regulations and another team takes over after the regulations change. Looking at appendix III we can clearly see three eras where Ferrari were foremost in 2000-2004, Red bull were dominant in 2010-2013, and Mercedes were dominating in 2014-2017. To

have one team superior to the others is as the team principal argues, not good for the sport in the long run. The audience want to see an exciting show with tough competition and close racing between all drivers. However, an increasing dominance of one firm in an industry does not necessarily indicate lack of competition. If the competition becomes more aggressive, then the leading firm usually reacts by innovating and thus becoming even more superior and putting even more distance to its competitors. Boone (2001) found however in his study that this is true when the competition creates a more aggressive interaction between the existing firms, and not when the competition gets intensified through a rise in the number of firms present. In the case of Formula 1, what this implies is that if the sport reduces its entry barriers and gives new teams a realistic chance to be competitive, then there is a lower probability of creating one dominating team although intensifying competition.

Looking at the essentials of sports as Szymanski (2003), there has to be an incentive to compete and to try and win in order for the sport to be interesting and entertaining. This incentive is of course correlated to the probability of winning, which means that with closer competition the sport would become more entertaining. This is in line with what the team principal argues in the interview concerning the future of the sport. He urged the management to create closer competition since he believed that they would all benefit from it, no matter what status a specific team has. As much of the revenue that is coming in to FOM comes from commercial rights, an increased attention to Formula 1 would result in more revenues for the sport. Furthermore, he believed that because they then could provide the fans with a much more entertaining sport, they would be able to maintain the audience over time.

If the payments from FOM to the teams were to be more evenly distributed, one could assume that the laggards would have an enhanced chance to catch up and compete with the top teams. Critics say that a team like Ferrari would suffer immensely since they would lose their status as a high-performance luxury brand if they were to be beaten by a low-status firm. However, studies like Castellucci and Ertug (2010) show that there is little risk of losing status because of a relationship with a lower-status firm. Evidence of this can furthermore be found in recent years since Renault, despite being a struggling team now, won the constructor's championship title in both 2005 and 2006, outscoring Ferrari. Despite this and many other losses, Ferrari remains a high-status brand. Another example of a high-status brand in Formula 1 not being affected by a lower status firm is Red Bull racing. They clearly have a good exchange relationship which benefits both.

5.3 Sports management and tournament theory

When it comes to sports management the design of the business model is facing several questions depending on what type of sport it is. In Formula 1 the issues at stake would for example be about how many teams should there be in a championship? What would be the optimal number of races? And of course, how the finances should be handled. Because sports are sold more as an entertainment than a consumer goods it is imperative that the management accommodated the fans as well as the competing teams. The constant change of winners and losers within the sport is what makes it interesting to follow over time. McLaren, Williams and Renault have all been winning the constructors championship but are now struggling to compete in the mid-field.

However, when organizing a sport, the managers face a problem with the nature of the fans. The research by Szymanski (2003) showed that the fans act differently in an individual sport than in a team sport. When following an individualistic sport, the fans tend to choose one contestant to support, usually one of the best participants, and if they are unhappy with their performance inside, or even outside, the sport they change to another contestant. In a team sport however, the fans usually choose a team based on brand or location rather than performance. Furthermore, as they identify themselves with the team they stay with the team even if their performance is poor. Putting this in relation to Formula 1, what it means is that even the losing teams have fans that support them.

Since the teams in Formula 1 have their origin from different countries the Formula 1 has a fan base from all over the world. Adding on to this, the drivers employed by the teams do not have to come from the same country as the team. This means that some fans stay with the team no matter who their drivers are because they identify themselves with the team, and some fans have a favourite driver instead and therefore change favourite team if the driver changes team. One of the main risks the Formula 1 management faces with this type of behaviour is a big possibility that the fans stop engaging in the sport if their team leaves the sport, whether it is due to financial issues (bankruptcy) or because they choose to leave for other reasons. Contradictory to what one might think, this is the main argument that critics to a more evenly financial distribution have. They argue that Ferrari, Mercedes and Red Bull have the biggest fan base and if those teams lose their bonuses and the competition intensifies with lower-status firms, they might choose to leave the sport and thus the sport loses all their fans. The reason why they would leave would probably not be because of a financial issue but rather because of the risk of losing their position in the status hierarchy.

Discussing the status argument from another perspective, the power balance between the firm and its customer, Formula 1 and the fans in this case, have according to Teece (2010) radically shifted with the development of the global economy. He argues that the new era demands greater communication, more supply alternatives and more transparency. This means that the firms need to become more customer-centric in their way of conducting their business. This transformation is especially true in Formula 1 as the sport has gone from being an invite-only and highly secretive sport to a fairly transparent, fans-friendly and open sport. The financial numbers used in this thesis was for example made official as late as in 2015 in one attempt to become more transparent. However, with this transparency the fans gain more knowledge of the business behind the sport and can therefore make a personal assessment of the teams' performance on the track instead of only looking at the scoreboard. This essentially means that since the fans know that Ferrari have a huge financial advantage, they will take this into account when determining how good they are. Furthermore, the team principal described the current situation in Formula 1 as a "two-class championship" since everyone knows which teams get the advantages. Putting this into an extreme scenario, a team like Ferrari might actually see their status decrease although they are one of the best teams simply because a team with lower financial means are coming closer.

Moreover, the team principal argued in the interview that the current financial system "is not sustainable for the business of Formula 1" and that it "is imperative that the new owners must think carefully to develop a system which gives all existing teams, and teams which are entering into the sport in the future, a realistic chance to compete well and to survive". The Formula 1 must therefore question themselves whether it is more important to have closer competition between all participating teams or if they should continue with accommodating for a few specific teams. Because unlike in the past, the fans nowadays have more knowledge of the business of Formula 1 and will therefore question the decisions made. There is no doubt that Ferrari is important for the team as they are a luxury brand that has participated from the start, that cannot be neglected, but are they more important than a good show for the audience? Because after all, without a good show, there is little hope of attracting new viewers to the sport to make it sustainable over time.

When it comes to the distribution of the prize money there are several ways a sport can handle it. Tournament theory is one of them and Formula 1 is already to a certain extent applying it through the performance pay. As explained previously, the basic idea of tournament theory is that participants compete for a prize awarded depending on a hierarchical ranking rather than

the absolute outcome. The Formula 1 awards points for every race where the top ten drivers get points. These points are later summarised and the team with the most points over the season wins the championship. In the context of tournament theory, this means that it is only the final ranking that matters and not how many points they received. A key idea is that there is a clear winner and loser in the end (Connelly et al., 2014), meaning that if the prize spread is too narrow, the incentive to perform decreases. However, implementing tournament theory must be done with great care as studies has shown that large pay gaps might hinder firm performance instead of enhancing it in high-tech industries (Lin et al.,2012). This explained to arise because of the high fixed costs such as R&D costs, as well as the demand for greater cooperation within high-tech industries. High-tech industries should therefore consider closer pay gap than other industries.

Lastly, the incentive to compete is furthermore determined by the number of contestants, but even more importantly on the number of possible ranking levels (Connelly et al.,2014). Looking at the history of Formula 1, all teams receives funding from the ground pay (as long as they have competed in two of the past three years), but it is only the ten first teams that receive the extra funding from the performance pay. This means that when there are more than ten teams participating, then there will be teams missing out on the payment.

6. Conclusion

The Formula 1 is a complex sport with the aim to be the biggest and most technically advanced motor sport in the world. All industries evolve over time and the biggest issue that Formula 1 faces today is the threat of rising expenditures and teams leaving the sport of financial reasons. To make a fair assessment to the new owners of the sport, the thesis only used data from Formula 1 before the acquisition by Liberty Media at the end of 2017. In this thesis the aim was to make a first assessment of the financial distribution and performance within Formula 1. This was conducted by answering the following research question:

To what extent is the prize money distributed by FOM affecting the teams and their performance?

What the study found was that there is a big gap between the best paid and the worst paid team within Formula 1. Looking at the total amount received from the FOM, the gap was as big as \$145 million between what Ferrari (\$192m) received and what Manor (\$47m) received in 2016. The winning team was however Mercedes, but due to the extra bonuses to Ferrari, Mercedes still received \$21m less than Ferrari (\$171m in total). The study furthermore found that there is a strong correlation between the pay-outs from the performance pay and the teams position at the end of the year, where more money is linked with better position. There is also a strong correlation between the total pay-out and the teams' final position.

The study moreover concludes that there must be an incentive to compete, and win, in order for the sport to be sustainable as well as entertaining for the fans to watch. The team principal interviewed in the thesis fears that the current situation is not sustainable for the sport and that the management must find a new solution to the financial difficulties within the sport. Several teams have gone in to administration in recent years but even so there are critics to a more even financial distribution. Tournament theory is a possible solution if implemented correctly but the Formula 1 must choose whether they should support a few particular teams or intensify the competition and thereby try to create closer racing and an even more exciting sport.

6.1 Limitation of the study and future research

With this short timeframe and with the limited information available on the financial distribution within Formula 1, this study aims to make a first assessment of the current situation. It is therefore, with this lack of data, unrealistic to determine from this thesis whether more money from FIA could have prevented the recent bankruptcies of teams like Manor, Marussia

and Caterham F1 Team or what type of business model and financial distribution system would be optimal for the sport to use.

However, the author hopes that the thesis will shine light on the importance of good sports management to reassure that the sport will continue and be profitable in the future. For future research the author recommends a continuous study of tournament theory with the aim to find a suitable model for Formula 1. Furthermore, a comparison between Formula 1 and other financially successful sports such as the NFL or the NBA in the United States, could be a good way to find a profitable and sustainable business model for Formula 1.

As final words the author would like to emphasise that it is not possible to use this thesis to scrutinize the new owners of Formula 1, Liberty Media, as they are set to change the regulations henceforth. Formula 1 is a beautiful and astounding sport and there is no doubt that the sport will continue to grow in popularity.

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Appendix I

Interview Guide

1. What is your position in the team?
2. What is your general view of the current financial funds distribution between the teams within formula one?
 - a. How do you think that the future will look with the current system?
 - b. What kind of change is needed concerning the financial funds distribution?
 - c. To what extent do money affect performance the coming year? What other factors affects the performance?
3. What would you say is the main incentive for your team to compete in formula one? Meaning to be a part of formula one at all. (For example money, media attention, branding etc.)
 - a. To what extent is it acceptable for your team to make a loss and still continue to compete?
 - b. Does your team have to make a revenue from the sport?
4. What is the main incentive for your team to compete for better position/results?
 - a. What final position/result is your teams target at the end of the 2018 season? (If this is too delicate information, please state what your target was for 2017 season)
5. Do you think that there are teams that **will not** benefit from closer competition? (Meaning if all teams are performing more equal.)
6. What is your thoughts of a budget limitation?
7. Do you think that the incentives to compete would change with a budget limitation?
8. Do you have another proposal for the distribution of money to the teams?

Appendix II

The Teams payments during from FOM during the years 2015, 2016, 2017

	Ground pay			Performance pay			LST			Other			Total pay-out			Position from previous year		
	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017	2014	2015	2016
Ferrari	31	33,5	36	36	53,5	41	63	70	68	34	35	35	164	192	180	4	2	3
Mercedes	31	33,5	36	61	63,5	61	-	-	-	34	74	74	126	171	171	1	1	1
Red Bull	31	33,5	36	51	36,5	52	-	-	-	74	74	74	156	144	161	2	4	2
Williams	31	33,5	36	42	43,5	33	-	-	-	10	10	10	83	87	79	3	3	5
McLaren	31	33,5	36	32	16,5	31	-	-	-	34	32	30	98	82	97	5	9	6
Force India	31	33,5	36	29	33,5	36	-	-	-	-	-	-	60	67	72	6	5	4
Renault	31	33,5	36	20	30,5	16	-	-	-	-	-	-	51	64	52	8	6	9
Toro Rosso	31	33,5	36	23	23,5	23	-	-	-	-	-	-	54	57	59	7	7	7
Sauber	31	33,5	36	13	20,5	13	-	-	-	-	-	-	44	54	49	10	8	10
Manor	31	33,5	-	17	13,5	-	-	-	-	-	-	-	48	47	-	9	10	-
Haas	-	-	-	-	-	19	-	-	-	-	-	-	-	-	19	-	-	8

In million \$

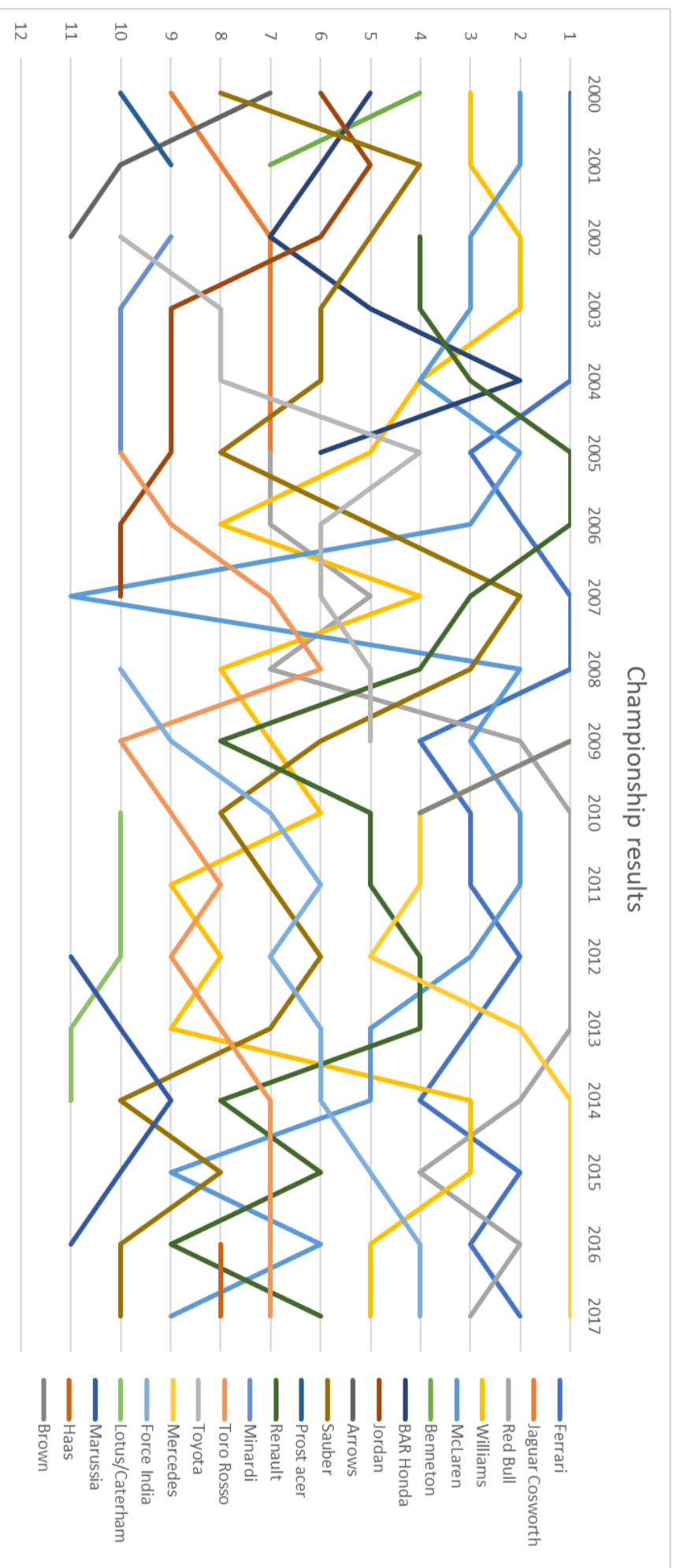
COL 1 = Payments are based a team's classification over two of the past three years

COL 2 = Payments are based solely on a team's classification the previous year

LST = Long-standing team

Other = Other specific bonuses like; A heritage bonus, First to sign agreements, Constructors' championship bonus

Appendix III



Source: Formula 1 Results, 2018