

The Influence of Players Contracts in Sport and Economic Performance of Brazilian Football Clubs

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Abstrac

Objective: This study analyzes the influence of the representativeness of players' contracts on financial and sports performance in Brazilian football clubs.

Method: Based on the 2020 Brazilian Football Confederation rank, our sample comprises 29 teams covering the 2011-2021 period. We use the players' contracts registered in the intangible assets as our primary independent variable. We also subdivided this value into professional and young players.

Results and Discussion: Results suggest that most big clubs invest more in professional players while small clubs in young players. Moreover, a higher investment proportion in players' contracts influences financial and sports performance. This is mostly confirmed by the investment in professional players, whereas the investment in developing young players could not be confirmed.

Contributions: Intangible assets play an important role in the overall success of football clubs, not only from a financial perspective but also in terms of their sporting achievements. This comprehensive study seeks to provide evidence that sheds light on the distinctive relationship between players' contracts and the subsequent impact on both the sporting and financial performance of Brazilian football clubs. Furthermore, it is worth noting that in Brazil, clubs have the unique advantage of being able to capitalize on costs associated with the development of young players, which is a distinctive setting to analyze.

Keywords: Brazilian Football Clubs; Financial Performance; Sport Performance; Intangible Assets.

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Introduction

In the field of football, players have an essential impact. Their quality determines sporting performance since higher players expenditures lead to higher league performance (Leach & Szymanski, 2015; Scafarto & Dimitropoulos, 2018; Szymanski & Smith, 1997). Furthermore, it is necessary to deepen knowledge about the mechanisms leading to developing the capacity to generate income through intangible assets (Baptista & Leitao, 2018).

Intangible assets are identifiable non-monetary assets without physical substance, as defined by the International Accounting Standards Board (IASB, 2021). In football, the cost of football players' signings from other clubs is registered as intangible assets. In Brazil, even the cost of developing young players can be registered as an intangible asset. Players provide future economic benefits to football clubs through their sports performance, enabling the club to generate revenue. Therefore, the relationship between intangible assets' value and sporting and financial performance has been a topic of study in the context of football clubs (Dimitropoulos & Limperopoulos, 2014; Mnzava, 2013).

Mnzava (2013) examines the intangible assets' impact on sports and UK-listed football clubs' financial performance. The study suggests that sporting performance and revenues are positively influenced by intangible assets, particularly players' registration costs. Dimitropoulos and Limperopoulos (2014) found similar results in the context of Greek football clubs. Their findings suggested a positive relationship between intangible assets and sports performance. However, they observed a negative relationship between profits and intangible assets.

In European football clubs, all costs related to the development of players are treated as a cost and cannot be included as intangible assets (Maroun et al., 2022). Brazil presents an important research avenue to present evidence regarding the impact of investment on young players on financial and sports performance since these costs can be capitalized on the balance sheet.

Player registration costs represented, on average, 16% of total assets in Brazilian (Barabanov & Nakamura, 2019), 24% in English clubs (Mnzava, 2013), and 32% in Greek clubs (Dimitropoulos & Limperopoulos, 2014). These figures exemplify this asset's financial importance in the football industry (Krauspenhar & Rover, 2022). Additionally, investments in players intend to contribute to the sports performance of clubs (Mnzava, 2013; Scafarto & Dimitropoulos, 2018; Szymanski & Smith, 1997). Therefore, this is an essential financial and sports asset for football clubs.

Therefore, the literature has presented evidence regarding

the impact of young and professional athletes' costs, as inputs, in their financial efficiency (Silva et al., 2020) and the relationship between these costs and sports performance (Krauspenhar & Rover, 2020). In addition, Marotz et al. (2020) analyzed the effect of intangible assets on Brazilian football clubs' financial and sportive performance and their results suggested a positive relationship. However, the impact of the representativeness of players' registered costs on the balance sheet, segregating them into professional and young athletes, on both the financial and sportive performance considering 10 years has not been tested.

Therefore, to cover this gap, we aim to analyze the influence of the representativeness of players' contracts on financial and sports performance in Brazilian football clubs. Our sample comprises 29 Brazilian football clubs over the 2011-2021 period. The results suggested that investing in players' contracts has a positive influence on both financial and sports performance. Therefore, Brazilian clubs with higher investments in players can generate more revenues and achieve better sportive performance.

Besides, we divided players' costs representativeness into professional players' costs and young players' development costs. The results indicated that only the professional players' related costs influenced both financial and sportive performance.

The evidence presented in this paper can provide useful conclusions. Managers and directors of football clubs can observe the impact of the representativeness of players' contracts on the balance sheet and consider reallocating investments to this area. Moreover, the sporting context in Brazil is interesting for exploring the role of intangible assets, since most clubs are nonprofit organizations (Dantas et al., 2015) and have financial difficulties (Minatto & Borba, 2021). With Law 14,193/2021 approval, clubs have received financial resources due to the potential to transform their legal structure from nonprofit associations into corporations (Gomes et al., 2022). Finally, we aim to contribute to finance and accounting research by presenting evidence of the role of intangible assets on the performance of firms (Mnzava, 2013).

2 Literature Review and Research Hypotheses

The investment in football players is the main expense of a football club, when adding up the amortization of transfer costs and wages (Rowbottom, 2002). In Brazil, for instance, the mean value of 2016-17 is approximately 16% (Barabanov & Nakamura, 2019). This is expected since player talent investment is required to consistently win matches (Leach & Szymanski, 2015), the primary

purpose of most football clubs (Sloane, 1971). Therefore, football clubs invest in players expecting to improve their sportive performance.

The positive relationship between players' wages, as a proxy of player talent, and sportive performance is empirically demonstrated (Hall et al., 2002; Szymanski & Smith, 1997). Szymanski and Smith (1997) investigated whether British clubs maximize profits or sports performance. Their results suggested the maximization of investment in players, which positively impacts sporting performance. This strategy could not maximize profits because both transfer costs and salary expenses are higher, negatively impacting clubs' profitability. This focus on sports performance may explain why most European and Brazilian football clubs are in an insolvency situation (Minatto & Borba, 2021; Szymanski, 2017). In Brazil, the amateur and relatively little implementation of governance practices also may explain poor financial performance (Gomes et al., 2022; Nakamura & Cerqueira, 2021).

Amir and Livne (2005) explored the obligation of British football clubs to capitalize and amortize investments in player contracts. Since Financial Reporting Standard number 10 in Europe, issued in 1997, football clubs could not directly turn their investment in football players into expenses. The results did not validate the capitalization requirement as they indicated a weak association of intangibles with future benefits.

In addition, in British football clubs, Mnzava (2013) examined the impact of players' contract costs on their sports performance. His results supported a positive relationship, indicating that there was an increase in British football clubs' winning percentage as they increased the spending on players. Similarly, Dimitropoulos and Limperopoulos (2014) analyzed the influence of intangible assets on the sports performance of Greek football clubs. Their results indicated a positive relationship. Thus, the more a club spends on playing talent, the higher the winning percentage in Greek football clubs.

Campa (2021) examined the determinants of the difference between football player registration transfer fees and the estimated inherent value of transferred players. It is important to emphasize that players are registered according to the costs related to the transfer, but their valuation could be a different value. Therefore, his results suggested that this difference increases when the transaction is related to players already playing in the same national league when clubs acquire defenders when player registrations are negotiated during winter transfer windows, and when deals involve player registration swaps.

In the Brazilian context, Marotz et al. (2020) examined the influence of the investment in intangible assets in sports and financial performance before and after

the implementation of a fiscal law (PROFUT). The results suggested that the higher the proportion of those investments represented in the total assets, the clubs achieve better sports and financial performance, measured by clubs' revenues. However, the results do not corroborate with the expected positive relationship between sports and financial performance.

In this study, we measure sports performance through the points obtained in the Brazilian Football Confederation Ranking. Therefore, based on the Mnzava (2013) and Dimitropoulos and Limperopoulos (2014) findings, the first research hypothesis is stated as follows:

H₁ – The representativeness of player contracts positively influences sports performance.

The measurement of financial performance in football clubs does not have a consolidated proxy. Some studies consider a measure related to their profitability, for example, Return on Assets (ROA) or Profit Margin (Dimitropoulos & Limperopoulos, 2014; Sánchez et al., 2020). On the other hand, some authors consider that clubs aim to maximize their revenues to have more resources to invest in player talent. Mnzava (2013), for example, proposes that a football club's main objective is to maximize revenue and sports performance rather than maximize profits (Dobson & Goddard, 2004). Therefore, they use revenues or a related revenue measure such as total revenues or log revenues (Guzmán & Morrow, 2007; Mnzava, 2013). In this study, we follow the second stream mentioned. We sustain that contrary to listed companies that have to maximize their shareholder value, the central incentive of managers of football clubs is the generation of glory, such as wins and titles (Kern & Süssmuth, 2005).

The evidence found by Barajas et al. (2005) suggested that sports performance had a higher explanatory power over revenues than profits in the English and Spanish leagues. Therefore, other factors other than sports performance may explain Spanish and English clubs' income, while sports performance is a good predictor for revenues.

The main assets of football clubs are football player registrations and the ownership of a stadium and training facilities (Rowbottom, 2002). In addition, investments in player contracts aim at increasing a football club's performance (Amir & Livne, 2000).

Before the Financial Reporting Standard 10 it was possible to register the players transfer costs as expenses or treat them as assets. Based on that discretionary choice possibility, Amir and Livne (2000) examined whether investing in players' contracts would result in probable future benefits for British football clubs. Their results suggested that investing in human capital could increase future benefits. Besides, as the economic benefits through services that players offer to the club are intangible, young

players' transfers and development costs are registered in intangible assets accounts (Mnzava, 2013). Thus, treating transfer values as assets instead of expenses could be adequate.

Dimitropoulos and Limperopoulos (2014) analyzed the influence of intangible assets on the profitability and viability of Greek football clubs, and their results suggested a negative relationship. Therefore, the more a club spends on playing talent, the more critical Greek football clubs' profitability and sustainability. Similarly, Mnzava (2013) examined the impact of intangible assets on the financial performance of British football clubs. They measured financial performance as the logarithm revenues and the results indicated a positive relationship. Therefore, the more a club spends on playing talent, the more revenue British clubs have.

Player trading is a relevant part of a football club's operation. During every transfer window, players are sold, loaned, and bought, leading to revenues and expenses associated with these negotiations. Scafarto and Dimitropoulos (2018) examined the impact of the net value of player trading, as a proxy of investment in human capital, on the financial performance of Italian football clubs. The authors also factor in the role of corporate governance. Their findings indicate that clubs with both CEO duality and substantial family board representation tend to profit more from investments in player contracts compared to clubs lacking these governance structures.

The efficiency of the costs is a major topic in the analyses of football clubs' financial performance. Silva et al. (2020) examined the impact of costs related to the development of young players and professional contracts on total revenues. Using the Data Envelopment Analysis, the results suggested that the only club from São Paulo that was efficient in both years was Palmeiras. Fluminense and Atlético Mineiro also were efficient for at least one year.

In this study, we measure a football club's financial performance as its potential to generate revenues rather than profitability. Therefore, based on the Mnzava (2013) findings, the second research hypothesis is stated as follows:

H_2 – The representativeness of player contracts positively influences financial performance.

Regarding the cost related to the development of young players, there is an important difference between the accounting procedures in Brazil and Europe. In Europe, those costs can only be treated as expenses. Therefore, all the costs related to the salaries of young players, for example, will be expensed. Only when the player is a professional athlete will the costs related to its transfer be capitalized on the intangible assets (IASB, 2021).

However, when analyzing the regulation in Brazil, especially ITG 2003 (R1), the clubs can capitalize on the costs related to the development of players if they can be individually attributed. For example, young players' salaries can be capitalized and registered individually until they have a professional contract. Since the day they have a professional contract, these costs will be amortized until the end of the contract. The club can treat part or all of those costs as expenses since the normative does not make it mandatory to capitalize (CFC, 2018).

Therefore, Brazilian clubs offer a unique scenario where the contracts capitalized as intangible assets can be investigated. Moreover, comparing the contracts related to professional and young players is also possible because clubs disclose accordingly. Finally, it can be investigated if the relationship between these costs differs when considering young and professional players separately. The national literature has evidence discussing this segregation of intangible assets (Krauspenhar & Rover, 2020; Silva et al., 2020).

3 Data Collection and Research Design

Data collection and variables

This study population comprises the 50 best teams of 2020 in the Brazilian Football Confederation rank, which is used as a criteria in the literature (Dantas et al., 2017; Holanda et al., 2012). Our sample is composed of the teams that published the financial statements covering the 2011-2021 period in at least four fiscal years. If the financial statements are not available on their website, we use financial statements published in state football federations or newspaper websites.

As we use financial and sports performance variables in this study, some teams did not publish their financial statements or disclose the needed information. For example, some teams did not disclose the intangible assets' composition and the value of players' registration costs. We excluded these observations because this is our primary variable. Concerning the sports performance variable, we do not have missing data. Thus, we employ an unbalanced panel with 291 observations in total (29 clubs).

To measure financial performance, which represents the success off the field, we follow the proxy employed in Mnzava (2013), as the logarithm of total revenues. Concerning the sports performance variable, related studies such as Dimitropoulos and Limperopoulos (2014) used the number of wins and Mnzava (2013) employed the winning percentage. Considering the Brazilian context, where there are important competitions besides the national championship, we employ the logarithm of

points obtained in the Brazilian Football Confederation. This measure has been adopted in previous literature (Freitas et al., 2017; Holanda et al., 2012) since it considers the performance in the national competitions over the current and past four seasons. The scoring is weighted, assigning greater significance to performances

closer to the current season.

Table 1 presents the variables used in this study, their operationalization, and their theoretical background.

The independent variables of our models reflect the

Table 1:
Variables and their Operationalization

Variable	Operationalization	Theoretical Background
Dependent Variables		
Financial Performance	The logarithm of Total Revenue	(Mnzava, 2013)
Sporting Performance	The logarithm of points obtained in the Football Brazilian Confederation ranking	(Freitas et al., 2017; Marotz et al., 2020)
Independent Variables		
Players	(Player Registration Costs)/(Total Assets)	(Mnzava, 2013)
Professional	(Professional Players signings costs)/(Total Assets)	(Krauspenhar & Rover, 2020; Silva et al., 2020)
Young	(Development of young players costs)/(Total Assets)	(Krauspenhar & Rover, 2020; Silva et al., 2020)
Control Variables		
Cash Flow	(Operating Cash Flow)/(Total Assets)	(Amir & Livne, 2000, 2005)
Leverage	(Total Liabilities)/(Total Assets)	(Alaminos & Fernández, 2019; Pacheco, 2022; Scafarto & Dimitropoulos, 2018)
Size	Dummy variable that assumes the value of 1 if the club is one of the twelve biggest clubs in the country	(Dantas et al., 2015)
Year	Dummy variable representing the fiscal year to which the observation pertains.	(Dimitropoulos & Limperopoulos, 2014)
Division	A categorical variable assumes the value of 1 if the club is in the first division, 2 in the second division, 3 in the third division or fourth division.	(Dantas et al., 2017; Minatto & Borba, 2021)
Macroregion	A categorical variable assumes the macroregion where the club has its stadium and headquarters.	(Mourão, 2010)
Relegation	The dummy variable receives 1 if a club has been relegated to a lower division and 0 otherwise.	(Dimitropoulos & Limperopoulos, 2014)

Source: Prepared by the authors.

proportion of assets registered in the intangible assets group, measuring the players' contracts. We expect, based on the related literature (Dimitropoulos & Limperopoulos, 2014; Marotz et al., 2020; Mnzava, 2013), that the higher the proportion of those intangible assets on the balance sheet, the higher the impact on both financial and sports performance.

Additionally, we incorporate control variables into our models to account for other factors that influence the performance of a football club. The Cash Flow variable is expected to positively impact financial and sportive performance since increased cash flow streams from operations can be used to invest in players' talent. Conversely, we predict that leverage would negatively impact high-leveraged clubs with fewer resources to invest in players due to debt payment needs (Scafarto & Dimitropoulos, 2018).

As a variable, size is used to measure the football club's tradition and its fanbase's size (Dantas et al., 2015). This is expected to impact sportive and financial performance positively (Marotz et al., 2020). Similarly, the division variable reflects the hierarchy within the national championship, with expectations of a positive effect for clubs higher in this regard. We aggregate the observations from the third and fourth divisions because there are only a few clubs in this situation over the period. The macro-region could reflect the disposable financial resources of the region. Evidence suggests that sporting entities in population-dense and economically prosperous regions typically perform better (Cordery et al., 2018; Mourão, 2010). Finally, the relegation to lower divisions is expected to influence the performance negatively since the team will have less talent and financial resources than the previous season. The year variable controls for annual heterogeneity not captured by the data (Dimitropoulos & Limperopoulos, 2014).

Research Design

Once the data were standardized, we initiated the analysis of the results. First, we considered the descriptive statistics of the variables under analysis. Club size was used as a discriminating element, according to the criterion adopted by Dantas et al. (2015) and related research (Dantas et al., 2017; Minatto & Borba, 2021). The following clubs were classified as 'big': Atlético-MG, Botafogo, Corinthians, Cruzeiro, Flamengo, Fluminense, Grêmio, Internacional, Palmeiras, Santos, São Paulo, and Vasco. The remaining clubs were categorized as 'small'. We used the Mann-Whitney Wilcoxon test to examine the differences between these values, based on the median of the economic-financial and sports-related aspects.

To examine the first and the second research hypotheses, we consider two hierarchical linear models (Raudenbush & Byrk, 2002) – Model 1 and Model 2, In the first level,

the observations for each team over time; in the second level the aggregate observations of the team. The models are described below:

Modelo 1

$$Y_{it} = \alpha_{0i} + \alpha_1 Players_{it} + \alpha_2 Cashflow_{it} + \alpha_3 Leverage_{it} + \alpha_4 Relegation_{i,t-1} + \alpha_5 Division2_{it} + \alpha_6 Division3and4_{it} + \sum_{j=1}^{10} \alpha_{7+j} Year + \epsilon_{it} \text{ (Level 1)}$$

$$\alpha_{0i} = \gamma_0 + \gamma_1 BigClub_i + \gamma_2 SouthRegion_i + \gamma_3 NortheastRegion_i + \gamma_4 SoutheastRegion_i + u_i \text{ (Level 2)}$$

Modelo 2

$$Y_{it} = \beta_{0i} + \beta_1 Young_{it} + \beta_2 Professional_{it} + \beta_3 Cashflow_{it} + \beta_4 Leverage_{it} + \beta_5 Relegation_{i,t-1} + \beta_6 Division2_{it} + \beta_7 Division3and4_{it} + \sum_{j=1}^{10} \beta_{8+j} Year + \epsilon_{it} \text{ (Level 1)}$$

$$\beta_{0i} = \gamma_0 + \gamma_1 BigClub_i + \gamma_2 SouthRegion_i + \gamma_3 NortheastRegion_i + \gamma_4 SoutheastRegion_i + u_i \text{ (Level 2)}$$

Y_{it}: Dependent variable (Sport or Financial Performance) of team *i* in year *t*;

β_{0i}: team *i* average conditioned to independent variables equal to zero;

α_j β_j: effect of *j*-th independent variable;

ε_{it}: random error associated to team *i* in year *t*, supposedly normally distributed with zero mean and constant variance σ_{ϵ}^2 ;

γ₀: teams average conditioned to independent variables equal to zero (intercept);

γ₁: effect of team size variable;

u_i: random term associated to team *i*, supposedly normally distributed with zero mean and constant variance σ_u^2 .

The implementation of linear hierarchical models is useful for nested data structures with repeated or longitudinal measures. This method is increasingly gaining attention in accounting and finance fields because of the benefits when used in panel data structures (Hair & Fávero, 2019; Serra & Fávero, 2018).

We employ two general models where the independent variables are changed. In the first model, the independent variable Players is included. In the second model, we subdivide the Players' registration costs into i) Professional signing costs, and ii) Young players' development costs. The Young variable is the young development costs incurred by the clubs and registered in the intangible assets. The Professional variable is the transfer signing costs of professional players registered in the intangible assets. Both variables, Young and Professional, are scaled by total assets. In both models, we test two dependent variables (Financial and Sporting Performance).

We employ the variance inflation factor (VIF) to examine for multicollinearity in the models. Finally, all variables are winsorized at the first and 99th percentiles to reduce the impact of extreme outliers on the models. We implemented the models and the statistical tests using the R statistical software (R, 2021) and its packages. In addition, we use “lme4” to elaborate the hierarchical models (Bates et al., 2015).

4 Empirical Results

Table 2 illustrates the average cost related to players, including costs for young player development and professional player signings for each club of the sample. It also provides the average ratio of players to total assets for each club. There is heterogeneity among clubs. For instance, costs related to players represent 33% of Santos's total assets. For other clubs, like America MG, this percentage is as low as 2%, and 3% in the cases of Parana and Athletico. Over time, both the registered cost related to players and its representativeness related to total assets have increased.

In 2011, the average representation was 7.6%, whereas in 2021, it had risen to 14.9%. The highest value was recorded in 2019, at 19.3%. The results obtained by Barabanov and Nakamura (2019) corroborate our analyses since they found that the most representative intangible asset was players' contracts for all Brazilian clubs examined in their research and the mean value of the ratio of players' contracts divided by total assets was similar.

Regarding Young and Professional variables, there are clubs with more money spent on young players than on signing professional players, most of which are considered small to medium-sized clubs. For instance, ten out of seventeen small clubs have a higher mean value of young players when compared to professional players. On the other hand, among the biggest clubs, only Vasco invests more in young players.

Since big Brazilian football clubs have had more money to spend on transfers in recent years, they have chosen to invest in professional players where football performance is almost immediate. Conversely, investing in young players requires clubs to allow more time for the return on their investment, whether economically or in terms of sporting performance. Smaller clubs tend to invest more in young players as they have less financial capacity to compete with larger clubs in the transfer of professional players.

Table 2: Descriptive Statistics – Players

Club	Players	Young	Professional	Players/Total Assets
America MG	2,483,096	3,297,891	1,185,206	2%
Athletico	27,977,240	3,631,154	18,222,896	3%
Athletico GO	2,280,444	1,292,620	1,021,844	4%
Athletico MG	89,891,104	12,887,577	82,466,618	9%
Avaí	6,103,730	4,177,087	1,926,643	9%
Bahia	18,367,229	11,505,793	6,888,435	10%
Botafogo	18,224,258	9,918,666	13,697,894	20%
Ceará	9,281,969	4,694,614	5,436,300	20%
Chapecoense	132,458,409	33,012,909	99,486,000	12%
Corinthians	232,458,409	18,084,763	5,659,957	11%
Coritiba	88,894,405	13,306,195	72,548,210	7%
Cruzeiro	88,894,405	16,157,335	72,314,345	18%
Goiense	88,894,405	10,026,529	72,062,472	17%
Flamengo	40,725,258	20,462,241	117,064,714	18%
Fluminense	32,237,777	10,136,364	22,081,414	17%
Fortaleza	6,881,562	1,221,412	5,629,880	24%
Goiás	78,784,845	31,388,636	45,436,766	23%
Grêmio	68,772,307	1,019,278	2,407,135	7%
Internacional	68,772,307	10,339,197	49,440,110	7%
Juventude	4,474,241	1,019,278	2,407,135	7%
Palmeiras	155,485,021	15,268,548	139,516,525	26%
Paraná	4,474,241	9,907,571	10,467,000	3%
Ponte Preta	20,112,684	1,750,629	10,368,915	3%
Santos	62,725,535	14,685,903	47,989,643	33%
São Paulo	46,821,000	39,038,636	107,782,364	20%
Sport	28,405,479	12,124,636	16,280,843	14%
Vasco	28,405,479	15,852,918	12,552,561	14%
Vitória	7,226,479	3,248,413	3,978,066	10%

Source: Research data.

Table 3 presents the descriptive statistics of the variables employed in the models. The players' registration costs registered in the intangible assets represent at least 20% percent of total assets for 25% of our observations. More specifically, we can see those higher values originated through costs of transfers rather than development investments in young players. This is expected because most transfer values are higher than the costs related to young players' development. The highest values of Players, scaled by total assets, were registered by Santos in 2014 and 2013. Considering only the absolute values registered on players, the highest values were published by Flamengo in 2020 (R\$ 391 million) and Palmeiras (R\$ 367 million) in 2019.

As shown in Table 3, there are highly leveraged clubs in Brazil, mainly because the equity value is insufficient for some clubs. Cases with negative equity or a value close to zero are common and could result in highly leveraged clubs. This indicates an insolvency problem in Brazilian football clubs, as Minatto and Borba (2021) explored. Concerning the operating cash flow ratio, compared to Greek football clubs (Dimitropoulos & Limperopoulos, 2014), Brazilian clubs have lower ratios. The mean (median) value in Greek clubs is 0.18 (0.20), which is almost double compared to Brazilian football clubs.

The Mann-Whitney p-value for all variables was lower than the 5% threshold, which implies that big and small clubs in that period presented significant differences considering the sporting and financial variables. As expected, big clubs had higher levels of financial and sporting performance, a larger proportion of players and professional players, and increased cash flow and leverage. In contrast, only the proportion of young players was higher in small clubs when compared to big clubs.

Table 3:
Descriptive Statistics – Economic and Sportive Variables

	Big		Small					Min	Median	Mean	Max	SD	n	MW
	Min	Median	Mean	Max	SD	n								
FP	17,8	19,3	19,4	20,7	0,5	132	15,5	17,7	17,7	19,8	0,78	159	0,000	
SP	7,5	9,5	9,3	9,8	0,5	132	1,8	8,8	8,7	9,5	0,81	159	0,000	
Players	0,0	0,1	0,2	0,6	0,1	132	0,0	0,1	0,1	0,4	0,10	159	0,000	
Professional	0,0	0,1	0,1	0,6	0,1	132	0,0	0,0	0,0	0,3	0,07	159	0,000	
Young	0,0	0,0	0,0	0,1	0,0	132	0,0	0,0	0,1	0,3	0,06	159	0,021	
Cash Flow	-0,2	0,1	0,1	0,8	0,2	132	-0,4	0,0	0,1	0,8	0,19	159	0,008	
Leverage	0,4	1,1	1,7	9,7	1,6	132	0,1	1,0	1,4	9,7	1,32	159	0,003	

Source: Research data. Note: SP = Sports Performance, measured by the logarithm of points obtained in the Football Brazilian Confederation ranking; FP = Financial Performance, measured by the Logarithm of Total Revenues. Players = Ratio of Players registration costs registered in intangible assets divided by total assets. Young = Ratio of Young Players Development Costs divided by total assets. Professional = Ratio of Transfer Value Costs divided by total assets. Leverage = Total Liabilities scaled by total assets. Cashflow = Operating Cash Flow scaled by total assets. S.D. = Standard Deviation, n = number of observations. MW = p-value of the Mann-Whitney Wilcoxon median difference test.

Table 4 presents results regarding the sportive performance models. We present the null model, Model 1 with the players variable, and Model 2 where the players variable was segregated into Young and Professional. After analyzing the residual plots from the sports performance model and identifying discrepant values, we observed that these values could significantly impact the model's results, introducing distortions and potentially leading to unreliable outcomes. The inclusion threshold was set at 0.5 to ensure the utilization of only the most precise and dependable data in the analysis. Thus, 8 observations were excluded from the analysis.

Table 4:
Sportive performance models (H1)

	Null	Controls	Model 1	Model 2
(Intercept)	8,990***	7,274***	7,268***	7,283***
Player			0,006***	
Professional				0,007***
Young				0,00007
Cash Flow		-0,029	-0,062	-0,091
Leverage		0,0007	0,003	0,008
Relegation		0,199***	0,187***	0,195***
Division 2		-0,317***	-0,294***	-0,299***
Division3and4		-0,818***	-0,807***	-0,818***
Size		0,543***	0,507***	0,493***
Northeast		-0,011	-0,071	-0,071
Southeast		-0,125	-0,140	-0,156
South		-0,065	-0,079	-0,076
Between Variance (Intercept)	0,298	0,136 (-54%)	0,134 (-55%)	0,135 (-55%)
Within Variance (Residual)	0,515	0,155 (-70%)	0,148 (-71%)	0,147 (-71%)
Num.Obs.	283	283	283	283
AIC	477,7	-75,2	-84,1	-77,0
BIC	488,6	5,0	-0,2	10,5
ICC	0,3			

Source: Research data. Note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. The controls for the year variables have been excluded from this table, as they are not within the scope of our analyses.

As shown in Table 4, the proportion of players' values in total assets positively influences sporting performance (Model 1). Therefore, clubs with higher player registration costs relative to their assets tend to achieve better sporting performance. These results are consistent with Mnzava's (2013) for British clubs and Dimitropoulos and Limperopoulos's (2014) findings for Greek football clubs. Moreover, the evidence from Brazilian football clubs also suggests that the higher proportion of intangible assets implies an increase in sports performance (Marotz et al., 2020). This finding, therefore, validates our first research hypothesis.

Regarding the control variables, dispute lower divisions hurt sportive performance, as expected. Furthermore, in the models referenced, neither cash flow nor leverage appears to significantly influence sporting performance. The macroregions did not influence the sporting performance. The results show that the size of the clubs has a positive effect on sports performance, as expected (Marotz et al., 2020). Also, the cash flow and leverage do not influence sportive performance on the referred models.

Based on the results of our player segregation into two categories - Young and Professional, we observed that only the Professional group had a positive and significant impact on the football clubs. One possible explanation for this outcome could be that professional players, due to their experience and skill set, tend to have an immediate impact on team performance, whereas young players might require more time to develop their skills and significantly influence the sport. Furthermore, when comparing the investment required to sign a professional player versus developing a young player, the investment for the former appears higher than that for the latter.

The variance was reduced by 59% after the inclusion of the control variables yet remained constant following the incorporation of the independent variables. The within variance also reduced after the inclusion of the control variables and has shown a little increase following the addition of the independent variables. When comparing the AIC and BIC from Model 1 to Model 2, both metrics increased, suggesting that the segregation of player variables into young and professional resulted in a worse fit. In Model 2, the Professional variable is both significant and positive, yet its explanatory power is limited, as indicated by the variations in both between and within variance.

The Intraclass Correlation Coefficient (ICC) of the models increased compared to the null model. One potential explanation could be that the inclusion of additional variables did not sufficiently account for the variability between clubs. This could have led to an inflated variance due to the incorporation of an extra variable.

We ran the regressions excluding the years impacted by the COVID-19 pandemic (2020 and 2021), and the results were consistent. Moreover, even when including discrepant values, the model provided similar results.

Similarly with the sportive performance models, upon analysis of the residual plots from the financial performance model and identification of discrepant values, we noted that these values could significantly impact the model's results, causing distortions and potentially leading to unreliable outcomes. An inclusion threshold of 0.6 was set to ensure that only the most precise and reliable data was utilized in the analysis. Therefore, 8 observations were excluded from the analysis.

Table 5: Financial performance models (H2)

	Null	Controls	Model 1	Model 2
(Intercept)	18,358***	17,265***	17,260***	17,296***
Player			0,005*	0,010***
Professional				0,044
Young				-0,009
Cash Flow		0,142	0,112	0,044
Leverage		0,052**	0,050**	0,038+
Division 1		0,038*	0,027*	0,048
Division 2		-0,369***	-0,549***	-0,590***
Division 3and4		-1,159***	-1,153***	-1,175***
Size		1,111***	1,677***	1,639***
Northeast		0,362	0,303	0,304
Southeast		0,154	0,167	0,205
South		-0,085	-0,190	-0,102
Between Variance	0,971	0,367 (-62%)	0,363 (-63%)	0,367 (-62%)
(Intercept)				
Within Variance	0,468	0,295 (-37%)	0,292 (-38%)	0,288 (-38%)
(Residual)				
Núm.Obs.	283	283	283	283
AIC	488,6	479,1	488,0	488,1
BIC	489,6	359,3	369,8	372,0
ICC	0,8			

Source: Research data. Note: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. The controls for the year variables have been excluded from this table, as they are not within the scope of our analyses.

As shown in Table 5, the investment in players positively affects financial performance (Model 1). Therefore, the higher the values in player registration costs, the more clubs generate revenues. These results are aligned with Mnzava (2013) for British clubs. This implies that the investment in players can be a determinant of the revenues since clubs sell players registered in their intangible assets, and the higher their registered value, the higher tends to be their selling price. Moreover, the investment in players could attract sponsorships, and increase the fanbase, besides the selling of players, all of that could contribute to raising revenue value (Dimitropoulos & Limperopoulos, 2014). This result confirms our second research hypothesis.

In Model 2 we segregated the Players registered costs in Young and Professional. The professional-related costs have a positive effect while the young, related costs have a negative effect. We argue that a higher proportion of professional players-related costs could increase revenues in the current season while the effect of the investment in young players could only be observed in future seasons. Analogous to the rationale of the players variable in Model 1, professional players can impact current financial performance by increasing other sources of revenue, particularly those related to player sales.

Regarding the control variables, clubs with high leverage negatively impact financial performance, as the literature

corroborates (Acero et al., 2017; Dimitropoulos & Limperopoulos, 2014). The size of the club also exerts a positive influence on financial performance (Dimitropoulos & Limperopoulos, 2014; Mnzava, 2013). Clubs from lower divisions have a reduced ability to increase their revenues, as the most prominent source, television rights, is significantly diminished in lower divisions.

The variance was reduced by 64% after the addition of the control variables but subsequently increased with the inclusion of the independent variables. Furthermore, the within variance diminished after including the control variables and showed a little increase following the introduction of the independent variables. Regarding the comparison of the AIC and BIC from Model 1 to Model 2, both metrics increased, suggesting that the segregation of player variables into young and professional does not enhance model fitness. Finally, the ICC of the models decreased by 25% compared to the null model. Therefore, adding variables in the three models contributes to explaining the variation among clubs.

When the pandemic period was excluded, the results remained consistent. However, with the inclusion of discrepant values, the Young variable became significant at a 10% level and exhibited a negative coefficient.

Regarding multicollinearity among independent variables, the Variance Inflation Factor (VIF) value was lower than 5 means in all models analyzed in this study. Thus, these results collectively suggest that multicollinearity does not qualitatively bias our results. Besides, we analyzed the residual plots to examine the homoscedasticity and normality and found no evidence of heteroscedasticity or non-normality issues that could influence our analysis.

5 Conclusions

The investment in football players, the main expense of a football club (Rowbottom, 2002), is required to win matches (Leach & Szymanski, 2015) consistently and is the primary purpose of most football clubs (Sloane, 1971). Therefore, this is a crucial topic to study when analyzing football clubs economically. Thus, this study examined the influence of the representativeness of players' contracts on financial and sports performance in Brazilian football clubs. We employed panel data regression based on 29 Brazilian football clubs composed over the 2011-2021 period.

The descriptive results indicated that intangible assets are relevant for Brazilian football clubs. Also, the players' registration costs comprise most of the intangible assets of Brazilian football clubs, corroborating the findings of Barabanov and Nakamura (2019) and Krauspenhar and Rover (2020). Concerning professional and young players' costs, most big clubs invest more in the former while small clubs latter. The maturity of both investments could explain this. While the investment in professional players

results in almost immediate results, investment in young players demands more years to impact. Moreover, small clubs rarely have the amount needed to contract a player, whereas the investment in developing players is smaller.

The results of our models confirmed the positive influence of investing in playing talent for both financial and sports performance. Furthermore, the sportive results support Mnzava's (2013) findings in British football clubs and Dimitropoulos and Limperopoulos's (2014) conclusions for Greek football clubs. Thus, this implies that the representativeness of player contracts, especially professional players, positively influences the sportive performance of Brazilian football clubs. Therefore, we could accept our two research hypotheses.

The financial performance models also support Mnzava's (2013) findings in British football clubs, implying that the investment in players associated with Brazilian clubs generates more revenues. Moreover, this effect is higher when considering young players' costs than professional signings. Therefore, in Brazilian football clubs, young players' investment is associated with generating more revenue. Investment in young players is essential both sportively and socially. The more clubs can invest in the young, especially regarding their health and education, the more prepared they will be. Moreover, since clubs occupy an important place in society, the investment in those young players' education can have implications even if they do not continue their careers as athletes.

Those findings can be determinant for the football market since competitive balance is an essential subject in sports economics (Kessenne, 2000; Plumley et al., 2018). Since investment in talent leads to sportive performance, it is essential that leagues can address the revenue sharing among clubs, enabling them to have similar investment capacity. Additionally, significant differences exist among the divisions, which influence the level of revenues. Therefore, the league could be more attractive if clubs could diminish budget differences.

Furthermore, we provide insights for the regulators of the football industry by indicating that leverage negatively influences both sports and financial performance. Additionally, the literature suggests that a majority of Brazilian football clubs are in a state of insolvency (Minatto & Borba, 2021; Oliveira & Borba, 2021). Thus, clubs must try to reduce the debt level and explore alternatives to mitigate this impact on their operations.

One important limitation of this study is that the results did not persist when considering profitability measures regarding financial performance. Thus, in opposition to Dimitropoulos and Limperopoulos's (2014) results, which suggested a negative relationship between players' costs and profitability in a Greek context, we could find any relationship in the Brazilian context. Also, the models

could have simultaneous endogeneity problems, given that the financial and sportive performance could impact the availability of resources to invest in players. Lastly, we tested the models without the 2020-2021 period, given in those years COVID affected the sportive and financial performance of football clubs, and the relationships held both economically and statistically.

Future studies could analyze the effect of the amortization costs related to players' contracts on sporting and financial performance and add additional control variables such as players' salary costs. Our objective was not to examine the club's transparency regarding the disclosure of financial information. However, we observed an improvement in the 2011-2021 period. Therefore, future studies could measure this progress.

References

- Aceró, I., Serrano, R., & Dimitropoulos, P. (2017). Ownership structure and financial performance in European football. *Corporate Governance: The International Journal of Business in Society*, 17(3), 511–523. <https://doi.org/10.1108/CG-07-2016-0146>
- Alaminos, D., & Fernández, M. Á. (2019). Why do football clubs fail financially? A financial distress prediction model for the European professional football industry. *PLOS ONE*, 14(12), e0225989. <https://doi.org/10.1371/journal.pone.0225989>
- Amir, E., & Livne, G. (2000). Accounting for Human Capital When Labor Mobility is Restricted. *SSRN Electronic Journal*, January, 43. <https://doi.org/10.2139/ssrn.202328>
- Amir, E., & Livne, G. (2005). Accounting, Valuation, and Duration of Football Player Contracts. *Journal of Business Finance and Accounting*, 32(3–4), 549–586. <https://doi.org/10.1111/j.0306-686X.2005.00604.x>
- Baptista, J., & Leitao, J. (2018). Intellectual Capital Assets and Brand Value of English Football Clubs. *International Journal of Sport Management and Marketing*, 1(1), 1. <https://doi.org/10.1504/IJSM.2018.10012990>
- Barabanov, R., & Nakamura, W. T. (2019). O intangível nos clubes brasileiros: Uma análise dos gastos com jogadores nas demonstrações contábeis. 119–133.
- Barajas, Á., Fernández-Jardón, C. M., & Crolley, L. (2005). Does Sports Performance Influence Revenues and Economic Results in Spanish Football? *SSRN Electronic Journal*, 3234. <https://doi.org/10.2139/ssrn.986365>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software*, 67(1). <https://doi.org/10.18637/jss.v067.i01>
- Campa, D. (2021). Exploring the Market of Soccer Player Registrations: An Empirical Analysis of the Difference Between Transfer Fees and Estimated Players' Inherent Value. *Journal of Sports Economics*, 152700252110595. <https://doi.org/10.1177/15270025211059527>
- CFC. (2018). ITG 2003 (R1).
- Cordery, C., Sim, D., & Baskerville, R. (2018). *Financial vulnerability in football clubs: Learning from resource dependency and club theories*. 24(1), 22.
- Dantas, M. G. da S., Freitas, R. M. de, Costa, M. A. A. da, & Barbosa, A. (2017). The determinants of Brazilian football clubs' debt ratios. *Brazilian Business Review, Special Issues*, 94–109. <https://doi.org/10.15728/edicaoesp.2017.5>
- Dantas, M. G. da S., Machado, M. A. V., & Macedo, M. A. D. S. (2015). Fatores determinantes da eficiência financeira e esportiva de clubes de futebol do Brasil. *Advances in Scientific and Applied Accounting*, 8(1), 113–132. <https://doi.org/10.14392/asaa.2015080106>
- Dimitropoulos, P. E., & Limperopoulos, V. (2014). Player contracts, athletic and financial performance of the Greek football clubs. *Global Business and Economics Review*, 16(2), 123. <https://doi.org/10.1504/GBER.2014.060181>
- Dobson, S., & Goddard, J. (2004). Revenue divergence and competitive balance in a divisional sports league. In *Scottish Journal of Political Economy* (Vol. 51, Issue 3, pp. 359–376). Wiley. <https://doi.org/10.1111/j.0036-9292.2004.00310.x>
- Freitas, M., Flach, L., & Farias, R. (2017). Efficiency Determinants in Brazilian Football Clubs. *Brazilian Business Review, especial(1)*, 1–23. <https://doi.org/10.15728/edicaoesp.2017.1>
- Gomes, R. M., Gomes, R. C., & Lisboa, E. (2022). From amateurism to professionalism: Legislation changes transforming Brazilian football. *Accounting, Auditing & Accountability Journal*. <https://doi.org/10.1108/AAAJ-06-2022-5834>
- Guzmán, I., & Morrow, S. (2007). Measuring efficiency and productivity in professional football teams: Evidence from the English Premier League. *Central European Journal of Operations Research*, 15(4), 309–328. <https://doi.org/10.1007/s10100-007-0034-y>
- Hair, J. F., Jr., & Fávero, L. P. (2019). Multilevel modeling for longitudinal data: Concepts and applications. *RAUSP Management Journal*, 54(4), 459–489. <https://doi.org/10.1108/RAUSP-04-2019-0059>

- Hall, S., Szymanski, S., & Zimbalist, A. S. (2002). Testing Causality Between Team Performance and Payroll. *Journal of Sports Economics*, 3(2), 149–168. <https://doi.org/10.1177/152700250200300204>
- Holanda, A. P., Meneses, A. F. de, Mapurunga, P. V. R., Luca, M. M. M. D., & Coelho, A. C. D. (2012). Determinantes Do Nível De Disclosure Em Clubes Brasileiros De Futebol. *Revista de Contabilidade do Mestrado em Ciências Contábeis da UERJ*, 17(1), 2–17.
- IASB. (2021). *IAS 38 Intangible Assets*. International accounting standards. <https://www.ifrs.org/issued-standards/list-of-standards/ias-38-intangible-assets/>
- Kern, M., & Süssmuth, B. (2005). Managerial Efficiency in German Top League Soccer: An Econometric Analysis of Club Performances On and Off the Pitch. *German Economic Review*, 6(4), 485–506. <https://doi.org/10.1111/j.1468-0475.2005.00143.x>
- Kesenne, S. (2000). Revenue Sharing and Competitive Balance in Professional Team Sports. *Journal of Sports Economics*, 1(1), 56–65. <https://doi.org/10.1177/152700250000100105>
- Krauspenhar, J. H., & Rover, S. (2022). O TESTE DE IMPAIRMENT MENTE? O CASO DOS ATLETAS DOS CLUBES DE FUTEBOL BRASILEIROS. *Contabilidade Vista & Revista*, 33(2), 183–208. <https://doi.org/10.22561/cvr.v33i2.7187>
- Krauspenhar, J. H., & Rover, S. (2020). Relação Entre o Desempenho Esportivo dos Clubes de Futebol Brasileiros e seu Ativo Intangível Consistente em Atletas. *XX USP International Conference in Accounting*.
- Leach, S., & Szymanski, S. (2015). Making Money Out of Football. *Scottish Journal of Political Economy*, 62(1), 25–50. <https://doi.org/10.1111/sjpe.12065>
- Marotz, D. P., Marquezan, L. H. F., & Diehl, C. A. (2020). Clubes de futebol: Relações entre investimento, desempenho e adesão ao PROFUT. *Revista Contemporânea de Contabilidade*, 17(43), 3–18. <https://doi.org/10.5007/2175-8069.2020v17n43p3>
- Maroun, W., van Zijl, W., Chesaina, R., & Garnett, R. (2022). The Beautiful Game: Fair Value, Accountability and Accounting for Player Registrations. *Australian Accounting Review*, January, 1–18. <https://doi.org/10.1111/auar.12368>
- Minatto, F., & Borba, J. A. (2021). Insolvency in Brazilian Football Clubs: Proposition of Models Based on Neural Networks. *Brazilian Business Review*, 18(6), 624–642. <https://doi.org/10.15728/bbr.2021.18.6.2>
- Minzava, B. (2013). Do intangible investments matter? Evidence from soccer corporations. *Sport, Business, and Management: An International Journal*, 3(2), 158–168. <https://doi.org/10.1108/20426781311325087>
- Mourão, P. J. R. (2010). *Regional Determinants of Competitiveness: The Case of European Soccer Teams*.
- Nakamura, W. T., & Cerqueira, S. de A. (2021). The New Era of Brazilian Football and Clubs Managed as a Business. *Revista de Administração Contemporânea*, 25(4), 1–5. <https://doi.org/10.1590/1982-7849rac2021210055.en>
- Oliveira, M. C. de, & Borba, J. A. (2021). Liabilities and contingencies of Brazilian football clubs. *Contextus – Revista Contemporânea de Economia e Gestão*, 19, 330–344. <https://doi.org/10.19094/contextus.2021.71172>
- Pacheco, L. M. (2022). The capital structure of Iberian football clubs: Does sports performance matter? *International Journal of Sport Management and Marketing*, 22(5/6), 336. <https://doi.org/10.1504/IJSM.2022.10053761>
- Plumley, D., Ramchandani, G., & Wilson, R. (2018). Mind the Gap: An analysis of competitive balance in the English Football League system. *International Journal of Sport Management and Marketing*, 18(5), 357–375. <https://doi.org/10.1504/IJSM.2018.094344>
- R. (2021). *R: A Language and Environment for Statistical Computing* [Software]. R Foundation for Statistical Computing. <https://www.r-project.org/>
- Raudenbush, S. W., & Byrk, A. S. (2002). *Hierarchical Linear Models: Applications and data analysis methods*. Sage Publications.
- Rowbottom, N. (2002). The application of intangible asset accounting and discretionary policy choices in the UK football industry. *The British Accounting Review*, 34(4), 335–355. <https://doi.org/10.1006/bare.2002.0215>
- Sánchez, L. C., Barajas, Á., & Sanchez-Fernandez, P. (2020). Profits may lead teams to lose matches, but scoring goals does not lead to profit. *European Research on Management and Business Economics*, 26(1), 26–32. <https://doi.org/10.1016/j.iedeen.2019.12.007>
- Scafarto, V., & Dimitropoulos, P. (2018). Human capital and financial performance in professional football: The role of governance mechanisms. *Corporate Governance: The International Journal of Business in Society*, 18(2), 289–316. <https://doi.org/10.1108/CG-05-2017-0096>
- Serra, R. G., & Fávero, L. P. L. (2018). Multiples' Valuation: The Selection of Cross-Border Comparable Firms. *Emerging Markets Finance and Trade*, 54(9), 1973–1992. <https://doi.org/10.1080/1540496X.2017.1336084>

- Silva, E. E. D., Santos, A. A. D., Silveira, M. A. P. D., & Mourão, P. J. R. (2020). Eficiência Financeira, Atores e Interações: Um Estudo do Fluxo de Jogadores entre Clubes e as Equipes Semifinalistas de São Paulo em 2017. *Internext*, 15(1), 88–103. <https://doi.org/10.18568/internext.v15i1.538>
- Sloane, P. J. (1971). The economics of professional football: The football club as a utility maximiser. *Scottish Journal of Political Economy*, 18(2), 121–146. <https://doi.org/10.1111/j.1467-9485.1971.tb00979.x>
- Szymanski, S. (2017). Entry into exit: Insolvency in English professional football. *Scottish Journal of Political Economy*, 64(4), 419–444. <https://doi.org/10.1111/sjpe.12134>
- Szymanski, S., & Smith, R. (1997). The English Football Industry: Profit, performance and industrial structure. *International Review of Applied Economics*, 11(1), 135–153. <https://doi.org/10.1080/02692179700000008>