

MANAGERIAL-INDUCED UNCERTAINTY AND FIRM PERFORMANCE: A TRANSACTION COST APPROACH

ABSTRACT

This paper investigates the influence of managerial-induced uncertainty on firm performance through a transaction costs economizing lens. I define managerial-induced uncertainty as frequent and hard to predict changes in the interaction rules between a seller and buyer that are generated by a trading party managerial action. In the presence of managerial-induced uncertainty, the costs of transactions are higher, impairing the economic activity, and resulting in lower performance levels. Using a dataset of stadium attendance and revenues in matches of the major soccer championship in Brazil, the empirical results point to negative effect of manager's deliberate and intense changes in price and place on attendance and revenues. The findings contribute to advancements in Transaction Costs Economics (TCE) literature, as well as the to the link between TCE and management literatures.

INTRODUCTION

Transaction Cost Economics (TCE) is concerned with organizational choices in the intermediate product markets (Williamson, 1985, 1996). In the mainstream research, asset specificity plays a central role in the choices for organization modes (Klein, Crawford, & Alchian, 1978; Williamson, 1991a). However, the traditional TCE's framework and its current empirical inquires tells us little about the performance of firms (Masten, 1993; Shelanski & Klein, 1995). Furthermore, other transaction dimensions such as uncertainty has a limited participation in the TCE's models and still presents ambiguous empirical support (David & Han, 2004). This paper departs from the argument that managers' actions and decisions can generate uncertainty in the exchange, and, therefore, raise transaction costs. Facing higher transaction costs, the level of economic activity decrease, and generates lower performance levels. Thus, this paper focus on the managerial-induced uncertainty in the

relationship between the seller and the final consumer through a transaction cost economizing lens.

Arguments putting uncertainty at the center of economic performance are not a novelty in the New Institutional Economics. The notion that institutions matter to the differences in economic development across countries is undisputed (Acemoglu, Johnson, & Robinson, 2009; North, 1991). In the process of economic change and development, the deliberate human effort to control the environment is a key function, and this is done by reducing uncertainty in the exchange (North, 2005). However, the economic development is a subject of the institutional environment branch of New Institutional Economics, while TCE constitutes the governance branch turning the attention to different phenomena (Williamson, 2000). Transactions costs are at the center of both approaches, but, in the firm and managerial levels, uncertainty is hardly associated to the intensity of firm growth or higher performance. This paper applies the institutional environment logic to the governance perspective, arguing that firms and managers, by setting rules and interaction norms, are also affecting the intensity of economic activities through uncertainty reduction (or increment).

I tested my ideas through a panel data of live stadium attendance of the major soccer championship in Brazil. In this country, managers of soccer clubs often change prices and places of matches, pursuing higher revenues as well as higher attendance in the events. However, sometimes, the changes in prices and places are frequent, providing a fertile empirical context to the investigation of managerial-induced uncertainty. Besides, the recent occurrence of important sports competitions in Brazil, such as FIFA World Cup and the Summer Olympic Games, resulted in changes of match's place in the local soccer competition. The reason for these changes is the stadium preparation for the international competitions making host regular soccer matches impossible for a short period in the year. But the changes in consequence of international competitions were foreseeable in advance, and, therefore, involved at least lower levels of uncertainty. Thus, the empirical context also

allowed the separation of managerial-induced uncertainty, which is a deliberate managerial action, from the foreseeable contingencies due to environmental changes from international competitions.

Empirical evidence shows that high rates of changes in the exchange place and exchange prices, that are not related to foreseeable market conditions, are associated to lower firm performance. As uncertainty is frequently attributed to the business or institutional contexts, this paper add new sources of uncertainty in the underlying mechanisms of transaction costs logic. Thus, the findings open new avenues not only to more emphasis of uncertainty in the current TCE paradigm, but also approximates TCE underlying logic to the state-level institutional environment branch of NIE. As managerial practices implications, as the new uncertainty source involves the action of trading parts in a transaction, the open new avenues to connect TCE and management literatures.

THEORY AND HYPOTHESES

Despite sharing a common foundation (Coase, 1937), the New Institutional Economics (NIE) usually employs distinct mechanisms to deal with different phenomena and throughout diverse levels of analysis (Williamson, 2000). In the state-level of analysis, formal rules of the game, such as polity, judiciary, property rights, among others, constitute the institutional environment and these features are crucial in explaining the development of nations (North, 1991; North & Weingast, 1989). In effect, changes in the institutions are the underlying determinant of the long-run performance of economies (North, 1990). In the organizational-level of analysis, the governance mechanisms that minimize transaction costs is the central phenomenon in the Transaction Cost Economics (Williamson, 1975). In this endeavor, transaction characteristics affect the choice for alternative organizational modes to govern the relationship among trading parties (Klein, Crawford, & Alchian, 1978; Williamson, 1985; Williamson, 1991a). These two branches have developed separately, and

the logic and mechanisms in the institutional environment state-level is not applied in the governance level for firms and consumers.

Institutions, Uncertainty, and the Costs of Exchange

Institutions are rules and norms constraining human interaction, and they determine the choices available for engaging in economic activity (North, 1991). Institutions are constructs of the human mind; i.e. artifacts that are socially structured to impose order and shape the interactions among economic agents in the competition for resources. In this competition process, order introduce greater predictability to human interaction, while disorder brings instability and leave rights open to expropriation (North, 2005). In this sense, “institutions have been devised by human beings to create order and reduce uncertainty in exchange.” (North, 1991: 97). The variation in the quality of the institutional environment can lead to increasing economic efficiency and growth or to stagnation, given that the rules of the game determine the level of uncertainty in a market economy (North, 1990; North, 2005). In consequence, good institutions are those which reduce uncertainty in exchange and, in consequence, generate more efficiency in transactions and higher economic performance. (Acemoglu, Johnson, & Robinson, 2005; Acemoglu et al., 2009).

The logic of institutions as enablers of economic growth and determinant of economic performance is not applied in the TCE literature, which is the governance branch of NIE. Transaction characteristics uncover relational dimensions of exchanges (Williamson, 1979), and the requirement for safeguards leads to choices of different organizational settings. According to TCE framework, transactions are the basic unit of analysis, and it can be described by three critical dimensions: (1) uncertainty, (2) frequency; and (3) relationship-specific investments in assets (Williamson, 1975, 1981). Nevertheless, TCE models accounts mainly on the latter transaction attribute, which is asset specificity (Klein et al., 1978), and the its predictions are restricted to vertical integration (“make-or-buy”) decisions in intermediate product markets (Williamson, 1996). The discriminating alignment hypothesis

(Williamson, 1991a) holds that as relationship-specific investments deepens, the governance costs curves of markets, hybrid, and hierarchical organizations rise in different ratios. The organizational choice is described by the lower governance cost curves, in a discrete (not marginal) fashion.

Uncertainty is relegated to contextual roles in the current TCE paradigm¹. On the one hand, as part of the discriminating alignment hypothesis, uncertainty can work as a shifter parameter to governance costs curves (Williamson, 1991a). Thus, in this sense, uncertainty is always linked to a certain degree of asset specificity, and it influences the discrete organizational choices. Uncertainty offers a conditional situation, given that intermediaries levels of asset specificity in the presence of higher uncertainty can lead to extinction of hybrid – contractual – organizations, because markets or hierarchy are better adapted to respond to new or unexpected events (Williamson, 1985). Therefore, in the presence of high uncertainty, low levels of asset specificity lead to markets and high levels of asset specificity leads to hierarchy, and no hybrid modes are found in between. Different from the asset specificity, the effect of uncertainty on the organizational choices present only mixed or fragile empirical support (David & Han, 2004)

On the other hand, in a different vein of explanation, uncertainty is related to co-occurrence of two or more different modes of organization, called plural forms (Bradach & Eccles, 1989). Distinguishing from the traditional tradeoff between “make *or* buy” in TCE, the plural forms literature put into question why firms “make *and* buy” simultaneously, which is a frequently found organizational arrangement (Krzeminska, Hoetker, & Mellewig, 2013; Ménard, 2013). In this endeavor, when asset specificity levels are in the frontier between different organizational alternatives, uncertainty plays a key role to explain the existence of plural forms (Parmigiani, 2007; Schnaider, Ménard, & Saes, 2018). TCE has made achievements in the theoretical (Tadelis & Williamson, 2010) and empirical efforts (Joskow,

¹ Footnote about frequency...

1987; Masten, 1996; Monteverde & Teece, 1982) to explain the discrete choices for organization modes. But, the relationship between transaction costs and economic performance in firm-level remains understudied (Shelanski & Klein, 1995; Williamson, 1999), and uncertainty can present a starting point to this task.

Managerial-induced Uncertainty and Firm Performance

Uncertainty has long been indicated as a key mechanism of organizational choices and firm's economic performance (Knight, 1921). The concept of uncertainty is related to the inability to accurately assess or forecast a future state of things, and, frequently, it is categorized under themes (Geyskens, Steenkamp, & Kumar, 2006). For instance, volume uncertainty is the inability to forecast quantities (Anderson & Schmittlein, 1984; Walker & Weber, 1987); technological uncertainty is the inability to forecast technical requirements (Walker & Weber, 1984); and behavioral uncertainty turn out to be the difficulty in assess whether the parties will comply with an agreement (Poppo & Zenger, 2002; Poppo, Zhou, & Li, 2016).

In effect, uncertainty is taken as an environmental characteristic (Klein, 2016; Packard, Clark, & Klein, 2017), which might explain the treatment as a contextual factor in TCE models. As part of the environment, investigations rely on contingency or intervening effects of uncertainty on decision-making, organizational choices and firm performance (Cannella, Park, & Lee, 2008; Qi, Zhao, & Sheu, 2011; Wong, Boon-itt, & Wong, 2011). Notwithstanding, changes inside organizations can be used as a signaling device, reducing uncertainty and impacting on the firm performance (O'Donoghue, 2004; Quigley, Crossland, & Campbell, 2017). Thus, managers taking decisions and actions inside organizations are also influencing how they are perceived by the market, and those actions are generating rules and norms for the interactions with suppliers and buyers.

Hence, decisions inside organizations are affecting how buyers are perceiving organizational actions, and they are shaping the interaction rules (Emerson, 1976). Beyond

organizational structures, firms are constantly interacting with consumers setting the place and price of the exchange. Using the institutional environment logic, rules that reduce uncertainty can avoid distortions and generate high levels of economic activity. During these interactions, if sellers make frequent changes in the exchange place or price, and those changes are hard to predict, the transactions are less likely to occur. In this way, if the managerial actions are increasing uncertainty and the transactions became less likely to occur, the result would be lower performance levels. Thus, my main hypotheses propose that firms constantly changing prices and places of their products would generate higher uncertainty, inhibit exchanges, and, consequently, generate lower performances.

Hypothesis 1 (H1): manager's decision of frequent and hard to foresee changes in the exchange places is negatively associated to the economic performance

Hypothesis 2 (H2): manager's decision of frequent and hard to foresee changes in the exchange prices is negatively associated to the economic performance

DATA, METHODS, AND ANALYSIS

Dataset

I investigated the relationship between managerial-induced uncertainty and economic performance through a dataset on stadium attendance and stadium revenues in the main Brazilian soccer championship. Thus, the study focuses on the effect of uncertainty on live stadium attendance and the consequent revenues of soccer clubs. The empirical frame suits to the research problem, given that many Brazilian clubs choose to define their matches in different cities and stadiums. Part of these decisions are related to few international competitions in the country, such as FIFA World Cup, FIFA Confederations Cup, and Summer Olympic Games. Nevertheless, most part of decisions to set matches outside the city or stadium of home teams has to do with revenues strategies of the clubs attracting fans who are geographically away from their clubs. Additionally, the stadium attendance dominates demand analysis of sports management, especially because relevant portion of revenues are

represented by the live expectation (Buraimo, 2008). Thereupon, the examination of the impact of managerial actions regarding places and prices on the stadium attendance in Brazil allows the accurate evaluation of uncertainty alters economic behaviors, consumption, and the performance.

I organized a panel of the matches in the major Brazilian soccer championship from 2012 to 2016. In the championship, 20 clubs compete annually, from May to December², in 38 rounds with ten matches per round (i.e. each team play a single match in each round, and each team play two matches against the 19 other competitors in the season). Consequently, there are 380 matches per season and 1,900 observations over the five years under study. However, due to missing data, no attendance attributed to legal punishments, and omissions generated by the employment of lagged variables, the dataset ended up with 1,458 usable observations. Although the panel includes a total of 29 clubs, the individual units in the panel are the clubs in each season. For instance, Flamengo in season 2012 received a different unit identification in the other seasons. Therefore, the dataset has 96 individual units, which is the home club (who is responsible for set the place and prices) of the match.

The dataset is an unbalanced panel. The unit of analysis is the match, the time period is the sequence of rounds within season instead of the season. Regarding the geographical location, most of the teams are located in the Southeastern and Southern regions, the most economic developed areas. In terms of match location, during the analyzed periods, there was matches in 43 different cities in all geographical regions of the country. Nevertheless, 81.5% of matches took place in the aforementioned two most developed regions, while 12.8% occurred in the Northeastern, 5.5% in the Center-Western, and only 0.2% in the Northern region.

Dependent and independent variables

² In 2014, the championship started in April, due to the FIFA World Cup.

Live stadium attendance and revenues. There are two dependent variables. The first dependent variable is the logarithm of the match-day *stadium attendance* as percentage of total stadium capacity (Buraimo, 2008). I focused on the fans that actually incurred in monetary costs to attend, as home clubs usually provide a number of tickets for free to invited visitors or other special situations due to local law specification (for instance, children under 12 years old or seniors above 65 years old receive free-pass in some states). The second dependent variable is the match's *revenue*, as an index of the normalized revenues in each match. To compute the index, it was considered the match's revenues divided by the season's average revenues all matches. The attendance figures were taken from the official website of the Brazilian Soccer Confederation (CBF – *Confederação Brasileira de Futebol*). The official website provides a financial bulletin for every match, informing quantity of sold tickets, number of spectators, revenues, and operational costs. There is no available information of championships of 2011 and before, which constrained the size of the assembled dataset for the purposes of this study. The stadium operational capacity was obtained in the CBF's stadium official registration, published in 2016. The operational capacity means the official measurement for capacity validated by public authorities, supervisory bodies, and security agencies.

Changes in exchange place. The first key independent variable measures the managerial-induced place uncertainty. I measured the *changes in exchange place* as the percentage of different cities where the home club assigned its last three matches. For instance, if all three matches occurred in three different cities, the variable assume the value of 1.0, while if the last three matches occurred in two different cities, the variable is equal to 0.67 – which is two divided by three. In this sense, the variable ranges from 0.0 to 1.0, accounting the degree of change in the match's place. In the considered period, 80.04% of matches had no place change in the last three matches, 9.47% had one place change, 4.46% had two place changes, and 6.04% had changes in all places in the last three matches.

Changes in the exchange prices. Another key independent variable accounts the managerial-induced price uncertainty. This variable captures the dispersion of ticket price in the last three matches. If ticket prices present high dispersion, the uncertainty regarding the prices are consequently high. I computed the variation coefficient – standard deviation of ticket price over the average ticket price – in the last three matches of home team.. From 2012 to 2016, the mean ticket price presented high dispersion, as the mean R\$ 27.44³ while the standard deviation is R\$ 32.56.

International competitions. Brazil hosted three large sport events: FIFA Confederations Cup, FIFA World Cup, and Summer Olympic Games. I assessed the effect of *international competitions* creating a dummy variable involving FIFA and Olympic Games assigning 1 in the month of the competitions and in the month is right before or right after competitions, if the home club's city received these competitions. During the years of 2013, 2014 and 2016 period, 7.89% of the matches were influenced by international competitions. Additionally, due to set up preparations, some stadiums remained closed for long periods. For instance, because of the Summer Olympic Games opening ceremony, the Maracanã – a stadium located in the city of Rio de Janeiro – was closed for more than six months as the ceremony affected the structure of the soccer field. Thus, the home clubs using the Maracanã to host their matches were forced to send their appointments to other cities or stadiums. Even if international competitions disturbed the home club's planning, these changes were foreseeable in advance and, therefore, it does not generate uncertainty. In this sense, the model includes two interaction terms: the first compute the interaction between place uncertainty and international competitions; while the second is the interaction between price uncertainty and international competition. The interaction terms are accounting those changes in place and prices that were not triggered by managerial decisions, but by foreseeable environmental contingencies.

³ Real, Brazilian currency

Control Variables. In Brazil, due to security reasons and geographic distances between cities, the stadium capacity is mainly dedicated to fans of home clubs. In fact, in some cities, matches between two local big clubs have the total stadium capacity dedicated to the home team, and fans of away team are forbidden by law to attend, to avoid violent reactions and disputes. Thus, in the control variables, I focus on the home team. Ticket price, loyalty of fans, winning clubs, significance of the match, and supply capacity are relevant determinants of demand for sports (Borland & MacDonald, 2003; Forrest & Simmons, 2006; Wakefield & Sloan, 1995). *Ticket price* is the normalized price index of the match. *Loyalty of fans* is the persistent habit of attend the matches, and this effect is captured by the logarithm of average attendance in the home team's previous three matches within the season. *Winning teams* tend to attract more public, and the result of previous home team performance assigns 0 to lose, 1 to draw, and 3 to win in the last home team match in-house. The match significance was assessed by two variables. First, rivalry among clubs in Brazil is high in the city level, i.e. between the biggest clubs located in the same city or immediate areas. In effect, *local clubs match* is a dummy variable identifies these matches between two clubs from the same city. Besides, second, some clubs have fans beyond their regions and have a large number of supporters across the country, and *large fans clubs* is a dummy variable assigning 1 if the away team is one of these clubs and 0 otherwise. The supply capacity is related to time and place of the match, i.e. the situations where fans have greater capacity to attend. First, I assessed *weekend* by a dummy variable that takes the value 1 if the match occurred on weekends and 0 otherwise. The second dimension of supply capacity is the *stadium operational capacity*, as the maximum number of fans within the stadium. Finally, a set of dummy variables control for the season and month. Table 1 summarizes all variables and presents the correlation matrix.

[Table 1 around here]

Analysis

First, live stadium attendance and revenues was modeled using pooled OLS with cluster-robust standard errors. Post estimations checks on the initial OLS analysis suggests heteroscedasticity of errors. Additionally, further assessment using iterated generalized least squares and likelihood ratio tests was performed, and also indicated the presence of heteroscedasticity. Likewise, tests for serial correlation of errors suggest the presence of autocorrelation (Drukker, 2003; Wooldridge, 2002). The use of panel data analysis can be influenced by problems of heteroscedasticity and serial correlation of errors. In effect, panel-corrected standard errors (PCSE) is suited to panel estimations in the presence of heteroscedasticity and autocorrelation (Cameron & Trivedi, 2009). Thus, I used PCSE to estimate different specification of the model, using the two dependent variables.

Results

Table 3 presents the results using the stadium attendance as dependent variable. Regarding the frequent changes in exchange place, in model 2, the independent variable presented a significant and negative effect on attendance. Model 3 shows that changes in exchange place still present significant and negative effect even when the interaction term between changes in exchange place and international competitions is included. Furthermore, the interaction term between change in exchange place and the international competition presents positive and significant effect on attendance, which means that changes in place in consequence of international competitions is associated to higher sales. The results of model 3, is also found in the model 6, which is the specification with all independent variables.

It is possible to indicate that frequent and hard to foresee changes in the match place is negatively associated to the fans attendance, given the results found to the variable of change in exchange place. Considering the fact that the occurrence international competitions are known in advance by club fans, the change in match place close to international competition is not diminishing sales. On the contrary, moving the match place to another city managers are attracting the fans as they are aware of the change in advance. The interaction term,

therefore, separate the effect of managerial-induced uncertainty from the changes owing to regular changes in market conditions. These results support hypothesis 1.

Table 3 also presents the results regarding the changes in the exchange prices. However, model 4 presents negative effect of changes in exchanges prices at only 10% of significance level. The following models 5 and 6 do not present any effect of changes in exchange prices or in the interaction term between change in exchange prices and international competitions. In this sense, using stadium attendance as dependent variable, hypothesis 2 does not find empirical support.

[Table 3 around here]

Table 4 presents the results using revenues as dependent variable. Initially, in model 8, the changes in exchange place does not present significant effect on revenues. But, in model 9, including the interaction between change in the exchange place and international competition, the isolated effect of change in exchange place becomes significant and negative, as expected. Besides, the interaction term present positive and significant association with revenues, showing that foreseeable changes in exchange place generates higher ticket sales. These results again support the hypothesis 1, showing the negative effect of managerial-induced place uncertainty on revenues.

Regarding the changes in exchange prices, model 10 shows a significant and negative effect on revenues, as expected. Models 11 and 12 also present the same result for the changes in exchange prices, which is the negative effect on revenues. Additionally, models 11 and 12 include the interaction term between changes in exchange prices and international competitions, and the interaction term does not present a significant effect on revenues. Thus, price variation in consequence of foreseeable changes in market conditions, due to occurrence of international competitions, are not influencing the revenues. These empirical results support the hypothesis 2.

[Table 4 around here]

DISCUSSION AND NEW DIRECTIONS

Empirical findings support the argument that managerial actions affect vertical relationship by the stipulation of interaction rules; and when these rules produce uncertainty, transaction costs are higher, resulting in lower performance levels. I investigated specifically the influence of managerial-induced uncertainty through two dimensions, prices and place, during the exchange between sellers and final consumers. Notwithstanding, the simple change in prices and exchange places is not necessarily bad for performance of firms, as the predictability of changes is also a central element. Thus, managerial-induced uncertainty are changes in the seller-buyer relationship, generated by managers inside organizations, that are not easily predictable by trading parties.

The effect of managerial-induced uncertainty on firm performance marks off uncertainty as a sole environmental characteristic where exchanges take place. This paper shows that economic agents involved in a transaction can influence the interaction rules directly, and these rules are shaping the economic outcomes. In other words, the economic agents, through their actions, are affecting transaction costs. Thus, this paper contributes to advancements in TCE framework and to the link between TCE and management literatures.

Advancing in TCE literature

In the TCE literature, the paper puts more weight inn the uncertainty as a central transaction characteristic. Putting uncertainty at the center of organizational analysis, this work approximates the TCE framework to the state-level institutional branch of NIE. In this sense, we move forward through same underlying logic in the state-level. Furthermore, the paper endogenizes transaction costs arguing that trading parties, through their behavior and actions, are affecting the costs of transacting. In this sense, managerial-induced uncertainty can complement empirical work on asset specificity, as this uncertainty type is not included in the current investigations. In addition, plural forms literature can also explore the effects of

managerial-induced uncertainty in the “make and buy” choices. Besides, the managerial-induced uncertainty has direct implications to link transaction costs to firm performance.

Linking TCE and Management Literatures

The findings yield practical implications for managers, especially linking actions to firm performance. In this sense, this paper contributes to management literature, more specifically, the strategic management. The potential benefits from the approach of strategic management through a transaction economizing lens are recognized for decades (Williamson, 1991b). Despite the long period, strategic management literature has made little advancements in the transaction costs explanations for firm performance. Barriers to integration of these two fields is possibly related to their primary question; while TCE paradigm is concerned with why firms exist, the strategic management investigations are occupied with why firms differ (Madhok, 2002). Thus, TCE paradigm is not conceived to explain differences in the economic performance of organizations, but only to predict organizational choices. Looking for mechanisms outside the current TCE paradigm, such as managerial-induced uncertainty, but using a transaction cost lens, is a way to open up new transaction cost insights for strategy issues (Foss, 2003).

Taking the underlying logic of state-level economic performance, the economic agents' by setting institutions (rules for interaction) are making deliberate efforts to control uncertainty, which is critical to determine the efficiency in the exchanges. My approach is focusing on the actions and efforts of managers to set interaction rules between them and the external trading parties. The nature of these rules is determining the level of uncertainty and, in consequence, the costs of transactions. In other words, the strategic approach of transaction cost economics is based in how managers inside organizations are affecting exchange costs, and setting frictionless transactions, they achieve higher performance levels. In competitive markets, this logic suggests that firms that set solid and consistent rules have better competitive advantages.

Future studies might explore the underlying mechanisms of the strategic approach of transaction costs. First, future work can investigate the connection between resources and the reduction of managerial-induced uncertainty. Resources and competencies that create consistent market interactions and clear value creation paths to consumers may achieve higher performance. In this sense, the resource and transaction costs nexus are able to include the production features inside transaction cost analysis. Second and connected to the first one, the resources and transaction cost nexus can also illuminate the construction of strong strategic positioning.

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Table 1 – Descriptive Statistics and Correlation Matrix

	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Attendance	0.438	0.234	1.00											
2. Revenue	53,4516.2	66,3296.2	0.63*	1.00										
3. Ticket price	27.443	32.563	0.06*	0.42*	1.00									
4. Stadium capacity	39,920.6	20,248.6	-0.18*	0.46*	0.14*	1.00								
5. Loyalty of fans	0.423	0.182	0.57*	0.35*	0.13*	-0.16*	1.00							
6. Winning teams	1.783	1.291	0.20*	0.19*	0.07*	0.03	0.10*	1.00						
7. Local clubs match	0.067	0.250	0.15*	0.23*	0.08*	0.13*	-0.02	0.02	1.00					
8. Weekend	0.683	0.465	0.11*	0.10*	0.05	0.02	0.01	-0.03	0.11*	1.00				
9. Large fans clubs	0.531	0.499	0.17*	0.21*	0.09*	0.02	-0.01	0.02	0.10*	0.01	1.00			
10. International competitions	0.079	0.270	0.03	0.05*	0.03	0.03	-0.03	0.01	0.04	0.02	-0.01	1.00		
11. Changes in exchange place	0.122	0.276	-0.11*	-0.02	0.02	0.07*	-0.12*	-0.11*	0.04	0.02	0.02	0.34*	1.00	
12. Changes in exchange prices	0.258	0.223	-0.11*	-0.23*	-0.08*	-0.09*	-0.13	-0.05	-0.02	-0.02	0.02	0.05	0.19*	1.00

Mean and standard deviation before the variable transformation for attendance, revenue, ticket price, stadium capacity, and loyalty of fans. The correlation matrix presents the coefficients of the transformed variables, * $p < 0.05$

Table 2 – Results: Stadium Attendance as Dependent Variable

VARIABLES	Model 1 PCSE	Model 2 PCSE	Model 3 PCSE	Model 4 PCSE	Model 5 PCSE	Model 6 PCSE
Changes in exchange place (H1)		-0.116** (0.053)	-0.195*** (0.055)			-0.177*** (0.057)
Changes in exchange place x international competitions			0.418*** (0.146)			0.430*** (0.146)
Changes in exchange prices (H2)				-0.109* (0.065)	-0.095 (0.066)	-0.095 (0.066)
Changes in exchange prices x international competitions					0.125 (0.127)	0.125 (0.127)
Ticket price	-0.031** (0.014)	-0.032** (0.014)	-0.032** (0.014)	-0.032** (0.014)	-0.032** (0.014)	-0.032** (0.014)
Loyalty of fans	0.692*** (0.062)	0.689*** (0.062)	0.693*** (0.060)	0.689*** (0.062)	0.691*** (0.060)	0.691*** (0.060)
Winning teams	0.070*** (0.010)	0.068*** (0.010)	0.068*** (0.010)	0.069*** (0.010)	0.068*** (0.010)	0.068*** (0.010)
Local clubs match	0.350*** (0.048)	0.353*** (0.048)	0.346*** (0.049)	0.347*** (0.049)	0.342*** (0.049)	0.342*** (0.049)
Weekend	0.154*** (0.030)	0.155*** (0.030)	0.153*** (0.029)	0.155*** (0.030)	0.152*** (0.030)	0.152*** (0.030)
Large fans clubs	0.227*** (0.026)	0.227*** (0.026)	0.227*** (0.026)	0.228*** (0.026)	0.229*** (0.026)	0.229*** (0.026)
International competitions	0.132** (0.061)	0.175*** (0.068)	0.004 (0.082)	0.132** (0.061)	-0.072 (0.114)	-0.072 (0.114)
Constant	-0.659*** (0.093)	-0.650*** (0.091)	-0.623*** (0.091)	-0.639*** (0.091)	-0.607*** (0.090)	-0.607*** (0.090)
Observations	1,458	1,458	1,458	1,458	1,458	1,458
R-squared	0.538	0.541	0.550	0.542	0.553	0.553
Number of id	96	96	96	96	96	96
Dummies for season and month	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 3 – Results: Revenues as Dependent Variable

VARIABLES	Model 7 PCSE	Model 8 PCSE	Model 9 PCSE	Model 10 PCSE	Model 11 PCSE	Model 12 PCSE
Changes in exchange place (H1)		-0.067 (0.068)	-0.172** (0.079)			-0.067 (0.081)
Changes in exchange place x international competitions			0.572** (0.231)			0.555** (0.223)
Changes in exchange prices (H2)				-0.490*** (0.114)	-0.499*** (0.117)	-0.499*** (0.117)
Changes in exchange prices x international competitions					0.095 (0.217)	0.095 (0.217)
Capacity	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Loyalty of fans	0.645*** (0.081)	0.645*** (0.081)	0.648*** (0.080)	0.623*** (0.077)	0.628*** (0.076)	0.628*** (0.076)
Winning teams	0.080*** (0.014)	0.079*** (0.014)	0.079*** (0.014)	0.081*** (0.014)	0.081*** (0.014)	0.081*** (0.014)
Local clubs match	0.479*** (0.056)	0.482*** (0.056)	0.476*** (0.056)	0.475*** (0.057)	0.468*** (0.057)	0.468*** (0.057)
Weekend	0.188*** (0.039)	0.189*** (0.039)	0.188*** (0.039)	0.185*** (0.039)	0.183*** (0.039)	0.183*** (0.039)
Large fans clubs	0.398*** (0.034)	0.398*** (0.034)	0.397*** (0.034)	0.395*** (0.034)	0.395*** (0.034)	0.395*** (0.034)
International competitions	0.216*** (0.081)	0.243*** (0.089)	-0.004 (0.129)	0.219*** (0.080)	-0.081 (0.192)	-0.081 (0.192)
Constant	-1.088*** (0.109)	-1.088*** (0.110)	-1.069*** (0.112)	-1.019*** (0.112)	-0.997*** (0.115)	-0.997*** (0.115)
Observations	1,454	1,454	1,454	1,454	1,454	1,454
R-squared	0.539	0.539	0.544	0.555	0.560	0.560
Number of id	96	96	96	96	96	96
Dummies for season and month	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1