



## THE IMPACT OF MATCH-FIXING SCANDALS ON THE STOCK RETURNS OF PARENT COMPANIES AND SPONSORS: EVIDENCE FROM CHINESE PROFESSIONAL BASEBALL LEAGUE IN TAIWAN



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### ABSTRACT

Although an increasing number of literature indicate the positive impact of sponsoring major sports events or themed competitions, few studies have examined how a match-fixing scandal occurring in the most popular and national professional sports impacts the stock abnormal returns of the parent company and sponsor. Using event study method with content analysis, this study focused on the spillover effect of incidents involving sports ethics violations. Specifically, the impact of five match-fixing scandals of Chinese Professional Baseball League (CPBL) on the stock abnormal returns of parent company and sponsor was examined. Secondary data collected from the data base of CTMONEY was compared results of match-fixing scandals in the CPBL to determine whether the match-fixing scandals could be regarded as a symbolic message leading to diminish the average abnormal returns of the parent companies and sponsors. The results showed that not all occurrences of CPBL match-fixing scandals negatively impacted the abnormal returns of the parent companies and sponsors. The findings can help professional sports operators and sponsors understand the implications and spillover effects of negative professional baseball incidents on stock returns.

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**Keywords:** Match-fixing scandals, Stock returns, Parent company, Sponsors, Abnormal returns, Chinese professional baseball league (CPBL), Event study.

Received: 6 February 2016/ Revised: 7 March 2016/ Accepted: 10 March 2016/ Published: 15 March 2016

### Contribution/ Originality

This study is one of very few studies which have simultaneously combined with professional sport, sports ethics, marketing and finance. It revealed the impact of match-fixing scandals in professional baseball on the abnormal returns of parent companies and sponsors, and help look insight into the problem of Taiwan's professional sports.

### 1. INTRODUCTION

Although sports benefits the individual and society, its commercialization also breeds a dark side such that in elite sporting events, competitors are under pressure to win or perform well at all cost, resulting in the distortion of basic integrity and authenticity in sports (Park *et al.*, 2007). Early studies have demonstrated that an enterprise managing a sports team have positive impacts on its marketing performance. For example, Keller (1993) and

Gwinner and Eaton (1999) proposed brand image transfer where a team's performance produces a halo effect whereby a fan's image of the team and image of its company become consistent. Likewise, when D'Astous and Bitz (1995) and Crimmins and Horn (1996) incorporated brand image into their analytical framework, they found that consumer interest in a sponsored event affected their image perception of the sponsoring brand. In addition, consumers' reaction to the performance of a sporting event was found to be related to the event characteristics and their goodness-of-fit with the sponsor image. In other words, when events are more consistent with sponsor image, consumers are more likely to associate the positive attributes of the event to the brand image of the parent company. Hence, when consumers perceive an event as interesting, attractive and highly favorable, their perception and preference for the company's brand image are enhanced. However, very few studies have adequately explored the impacts of negative corporate incidents on the companies' specific market value. Similarly in professional sports, the spillover effect of match-fixing scandals on consumers and corporations should be further verified.

According to the definition of a negative corporate incident or information (Reidenbach *et al.*, 1987) it can be expanded to defining a negative moral incident in professional sports as "the moral or ethical violations by professional sport operators, or inappropriate management or other violations which causes sport fans or the overall society to negatively perceive the professional sports." Previous studies have examined negative corporate incidents in terms of several dimensions: (1) Consumer explanation of negative incidents and their subsequent reactions (Laczniak *et al.*, 2001; Klein and Dawar, 2004) (2) The effect of consumer attributes on the interpretation of the negative information or incidents (Klein and Dawar, 2004; Monga and John, 2008) (3) The effect of corporate's response to negative incidents on consumers (Ahluwalia *et al.*, 2000; Vanhamme and Grobben, 2009) and (4) The negative effect of spokesperson on company reputation (Louie and Obermiller, 2002; White *et al.*, 2009). Despite the lack of studies on negative incidents in professional sports, the existing researches in negative corporate incidents showed that the dimensions used in these studies are varied and lacking in clear theoretical perspective, and the results indicate that negative incidents significantly undermine corporate's reputation and subsequent consumer responses. Two important common perspectives are found in these studies: (1) A "self-orientation" focus for exploring the impact of negative incidents (i.e., internal impact on company's employees) and "other-orientation" (i.e., external impacts on customers) (Money *et al.*, 2006); and (2) The relationship between negative incidents and moral issues or corporate competency (Ahluwalia *et al.*, 2000;2001; Roehm and Tybout, 2006).

The impact of negative incidents on corporate value can be viewed as a spillover effect (Ahluwalia and Gürhan-Canli, 2000) which is defined as an event that occurs as the result of something else in a seemingly unrelated context. Professional sports are a form of service industry whose nature of operation is very similar to the brand management of a regular business. The past marketing researches have shown that negative corporate incidents are likely to change the consumers' evaluation on brand extension and generate an unfavorable spillover effect (Ahluwalia and Gürhan-Canli, 2000; Roehm and Tybout, 2006). Consumer behavior studies have also shown that experience of betrayal may affect consumer satisfaction and loyalty to the business (Ward and Ostrom, 2006; Wang and Huff, 2007; Grégoire and Fisher, 2008). Grégoire and Fisher (2008) and Wan *et al.* (2011) addressed that the quality of customer relationship is a crucial factor moderating the strength of betrayal sense when customers confront a negative corporate incident. Most studies on negative corporate incidents have found that customer's identity, loyalty and commitment to a business have a buffering effect on a negative incident (Ahluwalia *et al.*, 2000;2001; Grégoire and Fisher, 2008; Liu *et al.*, 2010). This is because with high-quality-relationship customers, a negative incident triggers the internal defense mechanism of customers (Ahluwalia *et al.*, 2001) who then distort the negative incident to become consistent with their beliefs (Ahluwalia *et al.*, 2000) in order to avoid cognitive dissonance. This generalized

process causes these customers to discount the diagnostic capability of negative incident information, thereby buffering the impact. Nevertheless, recent studies have found that a high quality customer relationship may not necessarily mitigate the impact of negative incidents, but may instead magnify the impact. Aaker *et al.* (2004) found that service failure results in a greater negative impact for high-relationship-quality customers. Roehm and Brady (2007) found that for brands with higher equity, customers are more negatively affected by a severe service failure. In terms of customer retaliation and service recovery, Grégoire and Fisher (2008) and Grégoire *et al.* (2009) asserted that a customer with high-relationship-quality will in fact increase the likelihood of customer retaliation. Such intense negative reaction from high-relationship-quality customers is termed the “love-becomes-hate” effect (Grégoire and Fisher, 2008) and occurs when corporation exhibits severe moral flaws (Liu *et al.*, 2010; Wan *et al.*, 2011) or when customers are given more time and resources to contemplate the service failure scenario (Roehm and Brady, 2007). Therefore, the relationship quality between professional sports and sports fans may be a moderate factor affecting the box office earnings during the match-fixing scandals.

In the last three decades, researches on the issues of popular sports incidents have focused on the impact of large-scale sporting events such as the Olympics and World Cup on a country’s economy or corporate values. Using the input-output model, the US Economics Research Associates (1984) showed that the Los Angeles Olympic stimulated a total of \$2.3 billion in the local economy. Kim *et al.* (1989) and Brunet (1995) conducted an economic benefit analysis of the 1988 Seoul and 1992 Barcelona Olympic Games, and showed that these two Olympics brought a regional economic increase of 1.4% and 0.03% for South Korea and Barcelona, respectively. Humphreys and Plummer (1995) used input-output model to demonstrate a local economic growth of \$5.1 billion per year through the 1996 Atlanta Olympics. Andersen (1999) used the computable general equilibrium model (CGE) to estimate the impact of the Sydney Olympics on the local economy, and found that the Olympics increased the GNP of the host country by \$6.5 billion per year, and accounts for 2.78% of Sydney’s economy. Kasimati (2003) studied the impact of the Olympics on the host country, and found that the Olympics would affect the capital flows and economy of the host country. Veraros *et al.* (2004) took the announcement effect of host country in 2004 Olympic Games as an example, and found that when Athens was selected as the host city, the stock prices for certain classes in Greece were surged. Subsequent studies of 15 host countries for the 1988- 2014 Olympics by Dick and Wang (2010) show that when the host countries for the Summer Olympics were announced, the stock prices of the selected host countries also increased. In particular, the cumulative abnormal returns of small economic entities are more significant than those of large economic entities, but the effect was not significant for the Winter Olympics. Blake (2005) predicted the impact of the 2012 London Olympics, and found that hosting the Olympics increased Britain’s 2005-2016 GDP by £ 2 billion and created more than 8000 job opportunities. Kuper and Szymanski (2009) similarly predicted that the GDP of the 2010 World Cup championship winner would increase by 0.7%.

In terms of impact on specific industries, Papanikos (1999) and Balfousia-Savva *et al.* (2001) found that the Olympics would enhance employment in the tourism industry of the host country. However, Solberg and Preuss (2007) believe that although sporting events may create economic benefits for the tourism market, the profits may not necessarily exceed the investment cost. Nicolau (2012) found that when Spain’s national football team won the 2010 World Cup, its tourism market value increased significantly. In their study of the Sydney Olympics, Berman *et al.* (2000) found that hosting the Olympics is most closely related the country’s construction industry. Crawford and Bruce (1999) studied the impact of Michael Jordan’s retirement announcement from the professional Chicago Bulls basketball team, and the impact of retirement announcements from the professional Chicago White Sox baseball team on the abnormal returns of 34 sample businesses of five parent companies and Nike. Using event study and the

market model, the daily data on abnormal returns showed that Michael Jordan's retirement and comeback significantly impacted the stock prices of the sample businesses. [Krueger and Kennedy \(1990\)](#) and [Hill et al. \(1991\)](#) also used event study to analyze how hosting large-scale sporting events impacts the economy of a host corporation or country. In the last decade, a number of studies have shown that sponsoring large-scale sporting events have a significant impact on the stock prices of the sponsors, thereby indicating a positive correlation between the announcement of hosting major sporting events and the country's economic development ([Clark et al., 2002;2009](#); [Pruitt et al., 2004](#); [Cornwell et al., 2005](#)).

A few studies on the National Association for Stock Car Auto Racing (NASCAR) found a positive correlation between competition performance and stock returns on the company's consumer products ([Mahar et al., 2005](#)) where during the event, the equity of sponsors also increased ([Pruitt et al., 2004](#)). [Sullivan and Dussold \(2003\)](#) found that an accident in the team would negatively impact the stock prices of sponsors, but did not find a positive correlation between a team's winning and abnormal returns. Furthermore, in their study of sponsorship of major professional sports leagues, [Cornwell et al. \(2005\)](#) indicated that among the 53 sponsors of official products for the NFL, MBL, NHL, NBA, and PGA, sponsorship has a greater impact on the stock prices of high-tech companies than on other types of companies while the sponsorship benefits in the leagues and the fit between sponsors and sports are related to the degree of fluctuation in stock prices. [Clark et al. \(2009\)](#) analyzed 114 sponsors, and found that in professional tennis, golf tournaments, NASCAR and intercollegiate competitions, significant positive correlation is found between sponsorship and stock prices for high-tech companies and large scale corporations. In summary, most past studies focused on analyzing the positive effect of sport events on a company's market performance, that is, the positive impact of sports incidents.

[Krueger and Kennedy \(1990\)](#) used event study to show a positive correlation between the US Super Bowl and stock market. With the news that British professional soccer player David Beckham of the Manchester United Football Club has switched team for GBP 30 million, the parent company stock prices in London rose because the switching of team brings extra income to the parent company ([Giardina, 2003](#)). [Crawford and Bruce \(1999\)](#) used the market model to analysis that when the NBA star Michael Jordan first announced his retirement in 1993, the stock price of his endorsed brand, Nike, fell. However, his subsequent comeback announcement in 1995 brought billions of US dollars per year in related businesses opportunities. [Norris \(1997\)](#) found that the open of the American National Football league (NFL) championship usually stimulates investments in US stocks, and by the end of the championship, trading volume will grow substantially. [Chen and Chen \(2012\)](#) used event study to investigate the impact of Japan's professional baseball championship on parent companies' values and stock returns from 1985 to 2006, and found that on June 29, 2003, when the Hanshin Group's Tigers professional baseball team won Japan's Central League championship, the stock price of its parent company increased. Hence this study verified that with appropriate sports marketing strategy, the parent company of a professional baseball team can enhance its financial performance, especially for the retailer industry.

Summaring the existing literature, we found that the impact of a match-fixing scandal on the stock prices of parent companies has not been fully discussed for certain professional sports. Based on the efficient-market hypothesis, will a match-fixing scandal bearing significant market information affect investor's perception of the stock prices of parent companies or sponsors? On the other hand, past studies have shown that most sponsorship is positively correlated to abnormal returns in the short run. However, it should be further verified whether the news of a negative incident will cause the stock returns to fall.

Therefore, this study aimed to clarify the abovementioned issues, specifically: (1) Is there a significant correspondence between a match-fixing scandal in a professional sports and the abnormal return of its parent company and sponsors? (2) How great is the impact of the match-fixing scandal and how long does it last?

**2. METHOD**

To clarify the research questions, this study first used event study to determine the impact of five match-fixing scandals in the Chinese Professional Baseball League on the abnormal returns of its parent companies and sponsors. Panel data analysis was then employed to determine important variables affecting the abnormal returns during the period of the match-fixing scandals. At the same time, official statistics were collected from CTMONEY, the official website of CPBL and the Wiki Baseball Chronicle of Events for content analysis and comparison with the empirical results.

**2.1. Event Study**

The first step of event study determines the incident date, which refers to the point in time when the stock market received information regarding the incident under study rather than the time of occurrence of the incident. The negative CPBL incidents defined in this study referred to “scandals such as gambling and match-fixing by the baseball players,” but news of these incidents would have spread prior to the defined incident date, and the duration of the trial would be several years. Therefore, this study set the incident date as the first trading day following news announcement of judiciary investigation into gambling and match-fixing in the professional baseball league between 1990 and 2013, resulting in a total of 5 different incident dates. After determining the incident date, there is no objective standard for determining the duration of the match-fixing scandal. Generally, estimation for daily return is between 2-121 days, and the estimation window could be any day prior to and after the incident, or individually before or after the incident.

This study aimed to analyze CPBL’s match-fixing scandals, but the complexity and scope of the incident details are varied. Therefore the event window was set at 14 days before and 14 days after effective news of a CPBL’s match-fixing scandal. In setting the estimate window, this study used daily return rate as data. To avoid structural changes in the estimate window and prediction model as a result of excessively lengthy estimate window, the estimate window was set at 140 days prior to the incident plus the day of the incident. Hence the estimate window for the match-fixing scandal is 169 days. According to the research topic, the event study timeline for gambling, match-fixing and other similar incidents in the Chinese Professional Baseball League is shown in Figure 1.

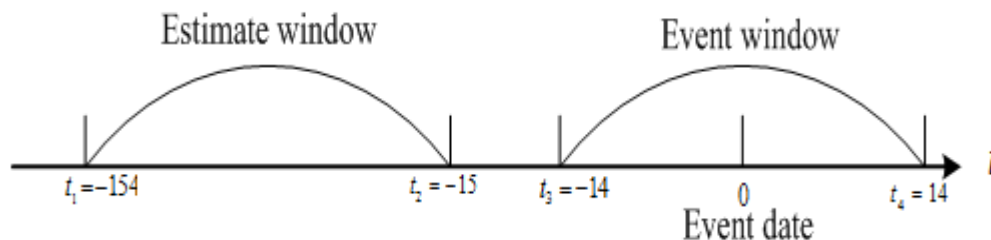


Figure-1. The timeline of each match-fixing scandal

Source: Original by the authors

The second step determines the expected return rate model. Before testing for abnormal returns, a model for expected returns must be determined. Three types of empirical models for expected returns are often employed:

mean-adjusted returns model, market adjusted returns model, and market model. Brown and Warner (1980;1985) believe that the market model produces a more accurate estimation under all kinds of assumptions. Dyckman *et al.* (1984) believe that the market model is slightly better than the other models in that the estimation is little affected by the daily data deviating from the norm although the sample values are observed on or around the calendar date of the incident. Campbell and Wasley (1993) recommended using the market model, discovered that the daily data in NASDAQ often deviated significantly from the norm, and recommended using nonparametric tests for better results. Therefore, this study adopted the market model to estimate expected stock return, as shown in Equation (1):

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} \quad (1)$$

Where  $E(R_{i,t})$  represents the expected return,  $\alpha_i$  and  $\beta_i$  represent the coefficients, and  $R_{m,t}$  represents the TAIEX market return on the  $t^{\text{th}}$  day.

The third step estimates the abnormal returns (AR), which is based on actual returns minus expected return during the incident, as illustrated in Equation (2):

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (2)$$

Where  $AR_{i,t}$  represents the abnormal returns of Company  $i$  in the incident duration  $t$ ,  $R_{i,t}$  represents the actual return of Company  $i$  in the incident duration  $t$ , and  $E(R_{i,t})$  represents the expected return of Company  $i$  in the incident duration  $t$ . As recommended by Fama (1976) to be more consistent with the assumption of normal distribution in basic regression analysis, the event study used the continuously compounded rate of return (CCR) to calculate the stock return. Based on this perspective, each return on stock for the parent companies and sponsors were defined according to Equation (3):

$$R_{i,t} = \ln(p_{i,t}/p_{i,t-1}) = \ln(p_{i,t}) - \ln(p_{i,t-1}) \quad (3)$$

Where  $R_{i,t}$  represents the CCR of Company  $i$  on the  $t^{\text{th}}$  day,  $p_{i,t}$  represents the closing price of Company  $i$  on the  $t^{\text{th}}$  day, and  $p_{i,t-1}$  represents the closing price of Company  $i$  on the  $t-1^{\text{th}}$  day. This study mainly calculated the average abnormal returns (AAR) and cumulative average abnormal returns (CAAR) to analyze whether incidents of gambling and match-fixing in CPBL impact the stock prices of the parent companies and sponsors. The AAR and CAAR for the companies were calculated according to formulas (4) and (5):

$$AAR_t = \sum_{i=1}^N AR_{i,t} / N, \quad t \in [t_3, t_4] \quad (4)$$

$$CAAR_t(t_3, t_4) = \sum_{t=t_3}^{t_4} AAR_t \quad (5)$$

Where  $N$  is the sample size of parent companies and sponsors,  $AAR_t$  represents the AAR of all the sample companies in the incident duration  $t$ , and  $CAAR_t(t_3, t_4)$  represents the CAAR from the incident duration  $t_3$  to  $t_4$ .

The final step tests for abnormal returns. Bartholody *et al.* (2007) recommend using nonparametric tests over parametric tests when testing AAR. In addition, given the small sample size in this study, instead of using traditional t-tests, nonparametric tests were used to verify abnormal returns to avoid estimation error due to significant non-normality of daily data.

## 2.2. Sample Selection and Data

The major match-fixing scandals in this study comprised professional baseball gambling and match-fixing revealed on specific dates on the official CPBL website. Generally, the incidents occurred between the first year of

the CPBL in 1990 and the 24<sup>th</sup> year in 2013. During this period, the gambling and match-fixing incidents occurred in 1996 (i.e., the Black Eagles Incident), 2005 (i.e., the Black Bears Incident), 2007 (i.e., the Black Whales Incident), 2008 (i.e., the Black Dmedia T-Rex Incident), and 2009 (i.e., the Black Elephants Incident). During the abovementioned match-fixing scandals, sample companies were selected according to whether the parent companies and primary sponsors were listed. Companies that were not listed or over-the-counter (OTC) were eliminated due to difficulty obtaining and authenticating financial information. Such a selection process may limit sample size and result in significant deviation from the norm. However, a review of incident studies indicates that such a statistical problem with sample size of less than 20 can be compensated by using non-parametric tests (Elayan *et al.*, 2003; Weiss, 2003; Josev *et al.*, 2004).

After the initial screening, the following parent companies were selected: China Trust, Wei Chuan, Mercuries, Uni-President, which changed its name to 7-ELEVEN in 2008, and Sinon. Their industries include finance, food and consumer goods production. The sponsor list was obtained from the official CPBL website, and verified with each ball team operator. Once the names and securities code of the CPBL parent companies and sponsors were confirmed, further information on their finances and trading stock prices were obtained from the CTMONEY database. In addition, the company properties were categorized and compared to determine the variables contributing to differences in abnormal returns.

Since the parent companies and sponsors vary each year, the data period in this study were divided into the 2005, 2007, 2008 and 2009 CPBL seasons, including the regular March to October matches and championships.

### 3. RESULTS

#### 3.1. Sample Description

Sample data comprised the CTMONEY daily data of parent companies, sponsor companies and Taiwan Stock Exchange (TWSE) TAIEX for the years 1996, 2005, 2007, 2008 and 2009, during which the CPBL gambling and match-fixing occurred. Using the CCR, individual stock or TAIEX daily returns were then calculated. Since the parent companies and sponsors for the CPBL changed frequently during the study period, the parent companies and sponsors at the time of particular incidents in their respective years were analyzed, as shown in Table 1.

**Table-1.** Sample Companies during Five Match-Fixing Scandals

Event Date (Involved Team)	Name of Professional Team	Stock code and name of parent company	Stock code and name of listed and OTC sponsor	Sample size
August 2, 1996 (China Times Eagles)	Brother Elephants	Unlisted, OTC		Parent company: 5 Sponsor:3
	China Times Eagles	Unlisted, OTC		
	Uni-President Lions	1216 Uni-President		
	Sinon Bulls	1712 Sinon	2518Ever Fortune Industrial	
	Chinatrust Whales	5841 Chinatrust Bank	2823China Life	
	Wei Chuan Dragons	1201 We--Chuan		
July 26, 2005 (Sinon Bulls · La New Bears)	Mercuries Tigers	2905 Mercuris	1203Ve Wong	Parent company:3 Sponsor:10
	Brother Elephants	Unlisted, OTC	2204China Motor, 2884Yushan Financial, 2352 Qisda, 2105 Cheng Shin Rubber	
	La New Bears	Unlisted, OTC	2886 International Commercial Bank of China (Mega Holdings)	
	Cobras	Unlisted, OTC	-	
	Uni-President Lions	1216 Uni-President	3293 International Games System, 2912 Uni-President 7-Eleven	
	Sinon Bulls	1712 Sinon	2353Acer, 2106Kenda	
				<i>Continue</i>

	Chinatrust Whales	2891 ChinaTrust Financial	2412 Chunghwa Telecom	
August 23, 2007 (Chinatrust Whales)	Brother Elephants	Unlisted, OTC	2204 China Motor , 2884 Yushan Financial, 2352Qisda, 2105 Cheng Shin Rubber	Parent company:3 Sponsor:10
	La New Bears		2886 International Commercial Bank of China (Mega Holdings)	
	Cobras		-	
	Uni-President Lions	1216 Uni-President	3293 International Games System, 2912 Uni-President 7-Eleven	
	Sinon Bulls	1712 Sinon	2353 Acer,2106Kenda	
	Chinatrust Whales	2891 China Trust Financial	2412 Chunghwa Telecom	
October 8, 2008 (Dmedia T-REX)	Brother Elephants	Unlisted, OTC	2204 China Motor ,2884 Yushan Financial , 2352Qisda, 105 Cheng Shin Rubber	Parent company:3 Sponsor:9
	La New Bears	Unlisted, OTC	2886 International Commercial Bank of China (Mega Holdings)	
	dmedia T-REX	Unlisted, OTC	-	
	Uni-President 7-Eleven Lions	2912 Uni-President 7-Eleven	3293 International Games System	
	Sinon Bulls	1712 Sinon	2353 Acer, 2106Kenda	
	Chinatrust Whales	2891 China Trust Financial	2412 Chunghwa Telecom	
October 26, 2009 (Brother Elephants)	Brother Elephants	Unlisted, OTC	2204 China Motor, 2884 Yushan Financial , 2352 Qisda , 2105 Cheng Shin Rubber	Parent company:3 Sponsor: 8
	La New Bears	Unlisted, OTC	2886 International Commercial Bank of China (Mega Holdings)	
	Uni-President 7-Eleven Lions	2912 Uni-President 7-Eleven	3293 International Games System,	
	Sinon Bulls	1712 Sinon	2353Acer, 2106Kenda	

Source: Selected from CTMONEY database.

### 3.2. The Tests of Mean Abnormal Returns

To determine whether a match-fixing scandal in the sample abnormal return test will reduce the value of the parent companies and sponsors, the sample companies were divided into parent companies and sponsors for comparative analysis. Table 2 shows that the 1996 Black Hawk incident impacted the AAR and CAAR of individual parent companies and sponsors in the sample, but did not significantly impact the abnormal returns, except for significant negative impact on the parent company's AAR 14 days before the incident date ( $t = -14$ ), two days before the incident date ( $t=-2$ ), and 12 days after the incident date ( $t=+12$ ). Impact on sponsors' AAR was insignificant during the incident window  $W(t=-14, t=+14)$ , and the impact on parent companies' CAAR was significant only on 14 days before incident date ( $t=-14$ ). This result indicates that a negative CPBL incident has only sporadic and brief significant negative impact on the parent companies. The reason may be that news of the match-fixing scandal was focused on individual athletes or teams, and the negative effect did not spread into the capital market. Moreover, the parent company (i.e., China Times) involved in the match-fixing scandal is not listed, and hence was not included in the analysis sample. Hence, although the negative impact on the abnormal returns of all the parent and sponsor stocks was sporadic, there is no clear capital market spillover effect in the sample companies.

The Black Eagles incident was the first professional baseball gambling incident in Taiwan. The case was complex. It was not only backed by mobsters, but also involved underworld inducement or threats to get players to abet in match-fixing. During the investigation, 10 players were taken into custody, prosecuted and suspended. The incident began in June 1996, and the court found 34 professional players guilty in September 10, 1997. The match-fixing scandal affected many teams and players, and fans were disillusioned, resulting in the decreasing number of baseball spectators each year. Professional sports management was in crisis, resulting in the dissolution of the China Times Eagles on September 15, 1998. At the end of 1999, two veteran teams, the Mercuries Tigers and the Wei Chuan Dragons also respectively dissolved.



Table-2. The Test of AAR and CAAR of Title Companies and Sponsors in 1996 Black Hawk

Event date	Title companies and sponsors (n=8)		Title companies (n=5)		Sponsors (n=3)		
	Day	AAR(%)	CAAR(%)	AAR(%)	CAAR(%)	AAR(%)	CAAR(%)
August 3, 1996	-14	-1.59(1.89)	-1.59(1.89)	-1.94(2.24) *	-1.94(2.24) *	-0.03(0.00)	-0.03(0.00)
	-13	1.98(1.13)	0.39(0.38)	1.67(1.34)	-0.28(1.34)	1.17(0.00)	1.14(0.00)
	-12	1.47(1.13)	1.86(0.38)	0.57(0.45)	0.29(0.45)	2.33(1.41)	3.47(0.00)
	-11	10.37(0.38)	12.22(0.38)	14.46(0.45)	14.75(0.45)	0.07(0.00)	3.55(1.41)
	-10	-10.01(1.13)	2.21(0.38)	-14.60(0.45)	0.15(0.45)	-0.74(0.00)	2.81(1.41)
	-9	9.47(1.13)	11.68(0.38)	14.13(0.45)	14.28(0.45)	0.12(0.00)	2.92(1.41)
	-8	-0.52(0.38)	11.16(0.38)	-1.12(0.45)	13.17(0.45)	-1.43(1.41)	1.50(0.00)
	-7	-10.40(1.89)	0.76(1.13)	-14.30(1.34)	-1.13(1.34)	0.43(0.00)	1.93(0.00)
	-6	9.83(0.38)	10.59(0.38)	13.92(0.45)	12.79(0.45)	0.89(1.41)	2.82(1.41)
	-5	-10.78(0.38)	-0.19(0.38)	-15.44(0.45)	-2.65(1.34)	1.40(0.00)	4.21(0.00)
	-4	1.06(1.89)	0.88(0.38)	1.08(1.34)	-1.58(1.34)	3.93(1.41)	8.14(1.41)
	-3	9.75(0.38)	10.63(0.38)	13.89(0.45)	12.31(0.45)	4.97(1.41)	13.11(1.41)
	-2	-1.05(2.65)***	9.57(0.38)	-1.12(2.24)*	11.19(0.45)	5.47(1.41)	18.58(1.41)
	-1	-10.31(0.38)	-0.74(0.38)	-14.67(0.45)	-3.47(1.34)	-1.93(0.00)	16.64(1.41)
	0	9.75(0.38)	9.01(0.38)	14.08(0.45)	10.61(0.45)	0.07(0.00)	16.71(1.41)
1	-0.33(1.13)	8.68(0.38)	-0.61(1.34)	10.00(0.45)	2.65(0.00)	19.36(1.41)	
2	-8.44(0.38)	0.24(0.38)	-12.26(0.45)	-2.26(1.34)	1.06(0.00)	20.42(1.41)	
3	10.00(1.13)	10.24(0.38)	13.74(1.34)	11.48(0.45)	0.79(1.41)	21.21(1.41)	
4	-10.22(1.13)	0.02(0.38)	-14.65(0.45)	-3.17(1.34)	-0.01(0.00)	21.20(1.41)	
5	-0.08(0.38)	-0.06(0.38)	-0.21(0.45)	-3.38(1.34)	-2.18(1.41)	19.02(1.41)	
6	11.00(0.38)	10.94(0.38)	15.15(0.45)	11.78(0.45)	-0.68(1.41)	18.34(1.41)	
7	-10.70(1.13)	0.24(0.38)	-14.95(1.34)	-3.18(1.34)	-0.85(0.00)	17.49(1.41)	
8	10.65(1.13)	10.89(0.38)	14.93(1.34)	11.76(0.45)	2.01(1.41)	19.49(1.41)	
9	-10.54(0.38)	0.35(0.38)	-14.95(0.45)	-3.19(1.34)	2.30(1.41)	21.79(1.41)	
10	9.17(1.89)	9.52(0.38)	13.25(1.34)	10.06(0.45)	0.47(0.00)	22.26(1.41)	
11	-11.34(1.89)	-1.82(0.38)	-15.66(1.34)	-5.60(1.34)	-2.87(1.41)	19.39(1.41)	
12	-0.52(1.13)	-2.34(0.38)	-1.08(2.24)*	-6.68(1.34)	0.41(0.00)	19.80(1.41)	
13	7.69(1.89)	5.35(1.13)	12.00(1.34)	5.32(0.45)	-0.26(0.00)	19.54(1.41)	
14	-11.19(0.38)	-5.84(1.89)	-15.36(0.45)	-10.05(1.34)	-1.09(1.41)	18.45(1.41)	

Note 1: The number in parentheses represented the Sign Z statistics

Note 2: \*  $p < .1$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

In Table 3, the AAR and CAAR test of all the sample companies, individual parent companies and sponsors during the 2005 Black Bears incident, results indicate inconsistent impact of match-fixing scandals on the sample companies' negative abnormal returns, as shown in Table 3. All the sample companies showed sporadic negative AAR 13 days before the incident date ( $t=-13$ ), 10 days before the incident date ( $t=-10$ ), 7 days before the incident date ( $t=-7$ ) and 3 days after the incident date ( $t=+3$ ); individual sponsors showed sporadic negative AAR 13 days before the incident date ( $t=-13$ ) and 3 days after the incident date ( $t=+3$ ); and individual parent companies showed no significant impact on the AAR during the incident window ( $t=-14$ ,  $t=+13$ ).

All the sample companies began showing significant negative CAAR 13 days before incident date ( $t=-13$ ), which reached the lowest -2.38% 10 days before the incident date ( $t=-10$ ). The CAAR of individual sponsors also fell to -2.56%, but the impact on the CAAR of individual parent companies was insignificant, and impact on CAAR was also insignificant after the incident date. This may be because news of the Black Bears incidents have already caused investors to withdraw from the stock market, resulting in a short-term negative abnormal returns. The results also implied that market information is an advance reflection of match-fixing scandals in the CPBL. However, the negative impact of the gambling incident on sponsors' abnormal returns seemed to last only a few days. In addition, the impact on parent companies' AAR and CAAR was not significant, and may be mainly due to the parent company (LaNew) being unlisted and hence not included into the incident analysis. Therefore, regardless of another gambling incident breaking out again after an uneventful period, the news remained focused on individual players or team

during the incident period, and the negative effect on the sample companies' CAAR lasted only a few days. Since the Black Bears incident in 1996, the average number of CPBL spectators decreased each year from 3408 people in 2005 to 2043 people in 2007.

Table 4 shows the AAR and CAAR of the sample companies, parent companies and sponsors during the 2007 Black Whale incident. It was found that during the incident window  $W(t = -14, t = +14)$ , the AAR of the sample companies, parent companies and sponsors showed significant, alternating positive and negative changes. The sample companies showed a significant positive CAAR (1.14%) 14 days prior to the incident ( $t=-14$ ), and gradually rose to + 10.98% 14 days after the incident. During the incident window, the sample companies and individual sponsors showed significant positive CAAR, which seemed to contradict generally expected reaction to a negative event. In addition to the Black Whales incident, it was also observed that in August 2007, Taiwan generally had a bull's market where TAIEX rose to more than 9,000 points and possibly obscured the negative impact of the Black Whales incident on the capital market of the sample companies, resulting in a significant positive CAAR. Moreover, the bull market in the greater market environment might have offset the negative impact of the Black Whales incident on the parent companies, resulting in no significant effect. Therefore, although stock returns could reflect the basic value of a company, the greater market environment has a considerably influence on stock prices. The results also showed that since professional baseball is a part of the sports industry, which is very small in Taiwan, a match-fixing scandal in the CPBL has very little negative impact on the companies' abnormal returns compared to the impact of a bull market on the stock prices of the overall industries.

In addition, the Black Whales gambling incident was the third gambling in the history of CPBL, but regardless of ongoing rumors about the Chinatrust Whales dissolving during that time, Jeffrey Koo, the CEO of its parent company Chinatrust Holding, announced no intention of quitting, but in fact organized the "I Love Baseball" activities with 6 representatives teams and publicly promised "Self-Respect, Self-Discipline, Self-Love" at the Tianmu Stadium. Moreover, beginning September 4, 2007, black ribbons were worn at every game as a symbol of protest against gambling. Although the market received the abovementioned positive messages, the positive impact on the CAAR of the parent companies was insignificant, indicating that the parent companies were negatively impacted by the incident. In particular, when another gambling incident erupted, the average number of spectators per CPBL game further declined from 2043 people after the Black Bears incident in 2007 to 1922 people in 2008.

**Table-3.** The Test of AAR and CAAR of Title Companies and Sponsors in 2005 Black Bears

Event date	Day	Title companies and sponsors (n=16)		Title companies (n=3)		Sponsors (n=13)	
		AAR(%)	CAAR(%)	AAR(%)	CAAR(%)	AAR(%)	CAAR(%)
July 25, 2005	-14	-0.44(1.15)	-0.44(1.15)	-0.62(0.58)	-0.62(0.58)	-0.20(0.33)	-0.20(0.33)
	-13	-0.83(3.46)***	-1.27(2.31)**	0.22(0.58)	-0.40(1.73)	-0.93(3.00)**	-1.14(1.67)
	-12	-0.38(1.73)	-1.65(2.89)**	0.28(0.58)	-0.12(0.58)	-0.47(1.67)	-1.60(2.33)**
	-11	-0.10(0.58)	-1.74(2.89)**	0.18(0.58)	0.06(0.58)	-0.21(0.33)	-1.81(2.33)**
	-10	-0.63(2.31)**	-2.38(3.46)***	0.05(0.58)	0.11(0.58)	-0.75(1.67)	-2.56(3.00)**
	-9	0.24(0.58)	-2.13(2.89)**	-0.87(1.73)	-0.76(1.73)	0.39(0.33)	-2.17(2.33)**
	-8	0.65(0.58)	-1.48(1.15)	-0.39(0.58)	-1.15(1.73)	0.88(0.33)	-1.29(0.33)
	-7	-0.73(2.31)**	-2.21(2.31)**	-0.10(0.58)	-1.26(1.73)	-0.72(1.67)	-2.01(1.67)
	-6	-0.33(1.73)	-2.54(1.73)	0.14(0.58)	-1.12(0.58)	-0.46(1.67)	-2.47(1.67)
	-5	0.01(1.15)	-2.54(1.73)	0.44(1.73)	-0.67(0.58)	-0.04(1.00)	-2.51(1.67)
	-4	-0.05(0.58)	-2.59(1.73)	0.23(0.58)	-0.44(0.58)	-0.13(0.33)	-2.63(1.67)
	-3	0.91(1.73)	-1.68(0.58)	0.81(1.73)	0.37(0.58)	0.75(1.00)	-1.88(0.33)
	-2	-0.58(1.15)	-2.26(1.15)	-1.36(1.73)	-0.99(0.58)	-0.15(0.33)	-2.03(1.00)
							<i>Continue</i>

	-1	2.55(2.89)**	0.29(1.15)	2.48(1.73)	1.48(0.58)	2.31(2.33)**	0.27(1.00)
	0	0.23(0.00)	0.52(0.58)	-0.99(1.73)	0.50(0.58)	0.59(1.00)	0.86(1.00)
	1	-0.74(2.31)	-0.22(0.58)	-0.26(1.73)	0.23(0.58)	-0.73(1.67)	0.13(1.00)
	2	0.40(1.15)	0.18(0.58)	-0.42(0.58)	-0.19(0.58)	0.81(1.67)	0.94(1.00)
	3	-0.92(2.89)**	-0.74(0.58)	-0.64(1.73)	-0.83(0.58)	-1.03(2.33)**	-0.09(1.00)
	4	-0.38(0.58)	-1.12(0.00)	-0.15(0.58)	-0.99(0.58)	-0.41(0.33)	-0.50(0.33)
	5	-0.01(1.15)	-1.13(0.00)	-0.42(0.58)	-1.40(0.58)	0.06(1.00)	-0.44(0.33)
	6	1.00(2.31)**	-0.13(0.58)	0.84(0.58)	-0.57(0.58)	0.73(2.33)	0.29(1.00)
	7	0.57(0.58)	0.44(0.00)	-0.82(1.73)	-1.39(0.58)	0.82(1.00)	1.12(0.33)
	8	0.12(0.00)	0.56(0.00)	-1.31(1.73)	-2.70(0.58)	0.67(1.00)	1.78(0.33)
	9	-0.44(1.15)	0.12(0.58)	-0.33(0.58)	-3.03(0.58)	-0.25(0.33)	1.54(1.00)
	10	0.06(0.58)	0.18(0.58)	-0.13(0.58)	-3.16(0.58)	0.09(1.00)	1.62(1.00)
	11	0.26(0.58)	0.44(0.58)	0.63(0.58)	-2.53(0.58)	0.25(0.33)	1.87(1.00)
	12	0.36(0.00)	0.89(0.00)	0.07(0.58)	-2.46(0.58)	0.59(0.33)	2.46(1.00)
	13	0.90(2.31)**	1.70(1.15)	0.80(1.73)	-1.66(0.58)	0.74(1.67)	3.20(1.67)
	14	0.16(0.58)	1.86(1.15)	0.12(0.58)	-1.54(0.58)	0.20(0.33)	3.40(1.67)

Note 1: The number in parentheses represented the Sign Z statistics

Note 2: \*  $p < .1$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

Table 5 shows the impact of the Black Dmedia T-REX incident on the AAR and CAAR of the sample companies, parent companies and sponsors. The sample companies showed significant negative AAR 13 days before the incident ( $t=-13$ ), 9 days before the incident ( $t=-9$ ), on the day of the incident ( $t=0$ ), 5 days after the incident ( $t=+5$ ) and 12 days after the incident ( $t=+12$ ); the sponsors showed significant negative AAR only 5 days after the incident ( $t=+5$ ); and during the incident window, the parent companies showed no significant impact on the AAR. The sample companies and individual sponsors showed sporadic negative CAAR 2 days after the incident ( $t=+2$ ) and 5 days after the incident ( $t=+5$ ), but individual parent companies showed no significant impact on the CAAR. This may be because the parent company involved (Vita Genomics) is unlisted, and therefore not included in this study. The result indicates that although the Dmedia T-Rex incident negatively impacted the abnormal returns of the sample companies, its duration was relatively short.

In the Black Dmedia T-Rex incident, all those involved in the match-fixing were the Dmedia T-Rex players and management level personnel, and hence the CPBL removed the Dmedia T-Rex team from their list. In 2009, the court ruled that the parent companies must compensate CPBL NT\$10 million. The Chinatrust Whales was also involved in the Black Dmedia T-Rex scandal, and was dissolved on November 11, 2008. During that time, CPBL spectators decreased to an average of 1922 people per game, indicating that fans were unwilling to watch CPBL games. However, the incident also prompted authorities to formulate the “General Baseball Promotion Plan” to revitalize baseball and lead the people to salvage the sports. During that time, the US subprime mortgage crisis impact on Taiwan’s stock market was also another noteworthy incident. The stock market took a plunge into bear market, and the TAIEX dropped to 5800 points and continued to decline. The market trend also resulted in the CAAR of sample companies to become more negative.

Table-4. The Test of AAR and CAAR of Title Companies and Sponsors in 2007 Black Whales

Event date	Day	Title companies and sponsors (n=16)		Title companies (n=3)		Sponsors (n=13)	
		AAR(%)	CAAR(%)	AAR(%)	CAAR(%)	AAR(%)	CAAR(%)
August 23, 2007	-14	1.14(1.94)*	1.14(1.94)*	0.42(0.58)	0.42(0.58)	0.99(1.26)	0.99(1.26)
	-13	0.89(0.83)	2.03(2.50)**	-1.05(1.73)	-0.63(0.58)	1.33(1.26)	2.32(1.90)*
	-12	0.49(1.94)*	2.52(2.50)**	0.91(1.73)	0.29(0.58)	0.29(1.26)	2.61(1.90)*
	-11	1.59(3.05)*	4.10(2.50)**	2.36(1.73)	2.65(1.73)	1.07(2.53)**	3.68(1.90)*
	-10	-0.55(1.39)	3.55(2.50)**	-0.72(1.73)	1.93(0.58)	-0.34(0.63)	3.34(1.90)*
	-9	-1.20(1.94)	2.36(1.39)	-2.49(1.73)	-0.56(0.58)	-0.33(1.26)	3.00(1.90)*
	-8	0.58(0.83)	2.93(1.94)*	0.18(0.58)	-0.38(0.58)	0.32(0.00)	3.33(1.90)*
							Continue

-7	0.64(1.94)*	3.57(1.94)*	0.61(1.73)	0.24(0.58)	0.45(1.26)	3.78(1.90)*
-6	-1.08(1.94)	2.49(1.39)	-1.81(0.58)	-1.57(0.58)	-0.82(1.26)	2.96(1.26)
-5	-1.04(1.39)	1.45(1.39)	-1.03(0.58)	-2.61(0.58)	-0.83(0.63)	2.13(1.90)*
-4	-0.39(0.28)	1.06(0.83)	-2.35(0.58)	-4.95(0.58)	0.11(0.63)	2.24(1.26)
-3	2.33(3.05)*	3.39(2.50)**	1.80(1.73)	-3.15(0.58)	1.93(2.53)**	4.17(3.16)**
-2	2.56(1.94)*	5.95(3.05)**	3.22(1.73)	0.06(0.58)	1.98(1.26)	6.15(3.16)**
-1	1.36(1.39)	7.31(3.61)**	2.51(0.58)	2.57(0.58)	0.77(0.63)	6.92(3.16)**
0	-0.09(0.28)	7.22(3.05)**	-0.56(0.58)	2.01(0.58)	-0.10(0.00)	6.82(2.53)**
1	-0.91(1.94)*	6.31(1.94)*	0.03(0.58)	2.04(0.58)	-0.95(1.90)*	5.87(1.90)*
2	-0.62(0.28)	5.69(1.94)*	-0.35(0.58)	1.69(0.58)	-0.78(0.63)	5.09(1.90)*
3	-0.63(0.28)	5.06(1.94)*	-0.07(0.58)	1.62(0.58)	-0.84(0.00)	4.25(1.90)*
4	1.06(0.28)	6.12(2.50)**	-0.89(0.58)	0.72(0.58)	1.69(0.00)	5.94(2.53)*
5	1.76(2.50)*	7.88(2.50)**	4.11(1.73)	4.83(0.58)	0.91(1.90)*	6.84(1.90)*
6	1.64(1.39)	9.51(2.50)**	3.93(1.73)	8.76(0.58)	0.48(0.63)	7.32(1.90)*
7	0.15(0.28)	9.66(2.50)**	0.10(0.58)	8.86(0.58)	0.09(0.63)	7.42(1.90)*
8	-0.59(0.83)	9.08(2.50)**	-1.58(0.58)	7.28(0.58)	-0.32(0.63)	7.09(1.90)*
9	0.47(0.28)	9.55(2.50)**	0.32(0.58)	7.59(0.58)	0.48(0.00)	7.58(1.90)*
10	1.46(2.50)*	11.01(2.50)*	-0.23(0.58)	7.36(0.58)	1.75(2.53)**	9.32(1.90)*
11	-0.60(2.50)**	10.41(2.50)*	0.19(0.58)	7.55(0.58)	-0.67(2.53)*	8.65(1.90)*
12	0.73(0.28)	11.14(2.50)*	0.50(0.58)	8.05(1.73)	0.93(0.63)	9.58(1.90)*
13	-0.45(0.83)	10.69(2.50)*	-0.19(0.58)	7.86(1.73)	-0.62(1.26)	8.95(1.90)*
14	0.30(0.28)	10.98(2.50)*	1.72(1.73)	9.58(1.73)	-0.13(0.63)	8.82(1.90)*

Note 1: The number in parentheses represented the Sign Z statistics

Note 2: \*  $p < .1$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

Table 6 shows the impact of the 2009 Black Elephants incident on the AAR and CAAR of sample companies, individual parent companies and sponsors. The AAR of sample companies showed sporadic significant negative returns only 4 days before the incident ( $t=-4$ ) and 14 days after the incident ( $t=+14$ ); the AAR of sponsors showed sporadic significant negative returns only 10 days before the incident ( $t=-10$ ) and 4 days before the incident ( $t=-4$ ); and the AAR of parent companies did not reflect significant impact during the event window  $W(t=-14, t=+14)$ . Similarly, during the event window  $W(t=-14, t=+14)$ , the CAAR did not reflect significant impact for the sample companies, individual parent companies or individual sponsors, indicating that the gambling did not have significant negative impact on the sample companies.

Although the Brother Elephants had the most fans during that time, the parent company (Brother Hotel) involved in the match-fixing scandal was unlisted, and therefore not included into this study. As a result, despite the 5<sup>th</sup> match-fixing incident in the CPBL, the overall negative impact on the abnormal returns of the parent companies and sponsors was insignificant.

Table-5. The Test of AAR and CAAR of Title Companies and Sponsors in 2008 Black Dmedia T-Rex

Event date	Day	Title companies and sponsors (n=14)		Title companies (n=3)		Sponsors (n=11)	
		AAR(%)	CAAR(%)	AAR(%)	CAAR(%)	AAR(%)	CAAR(%)
October 8, 2008	-14	0.87(1.73)	0.87(1.73)	-0.11(0.58)	-0.11(0.58)	0.37(1.00)	0.37(1.00)
	-13	-1.21(2.31)**	-0.35(0.58)	-3.40(1.73)	-3.51(0.58)	-0.91(1.67)	-0.54(0.33)
	-12	0.74(1.73)	0.39(0.58)	0.78(0.58)	-2.74(0.58)	0.24(1.00)	-0.30(0.33)
	-11	-0.20(1.15)	0.19(0.58)	3.00(1.73)	0.27(0.58)	-1.04(0.33)	-1.34(0.33)
	-10	-0.89(1.73)	-0.70(0.00)	0.86(0.58)	1.13(0.58)	-1.08(1.67)	-2.42(1.00)
	-9	-2.23(2.31)**	-2.93(1.73)	-1.40(1.73)	-0.27(0.58)	-1.67(1.67)	-4.09(2.33)**
	-8	0.06(0.58)	-2.87(1.15)	1.86(0.58)	1.59(1.73)	-0.27(0.33)	-4.36(1.67)
	-7	0.21(0.58)	-2.66(0.58)	1.05(0.58)	2.64(1.73)	-0.34(1.00)	-4.70(1.00)
	-6	0.79(0.00)	-1.87(0.00)	4.19(1.73)	6.84(1.73)	-0.28(1.00)	-4.98(1.00)
	-5	-0.87(1.15)	-2.74(0.58)	-0.81(0.58)	6.03(1.73)	-0.46(1.00)	-5.44(1.67)
	-4	1.07(0.58)	-1.67(0.58)	-1.49(1.73)	4.53(1.73)	2.14(1.67)	-3.30(0.33)
-3	-0.96(1.73)	-2.64(0.00)	0.82(1.73)	5.35(1.73)	-1.29(1.67)	-4.58(1.00)	
						Continue	

-2	-2.08(1.73)	-4.72(1.15)	-1.10(0.58)	4.25(1.73)	-1.95(1.67)	-6.53(1.67)
-1	-0.31(0.00)	-5.03(1.73)	-2.74(0.58)	1.51(0.58)	0.33(0.33)	-6.21(1.67)
0	-1.72(2.89)**	-6.75(1.73)	-1.11(0.58)	0.40(0.58)	-1.39(2.33)	-7.60(1.67)
1	0.72(0.00)	-6.03(1.73)	-1.01(0.58)	-0.61(0.58)	0.98(0.33)	-6.62(1.67)
2	-0.76(1.73)	-6.79(2.31)**	-0.37(0.58)	-0.98(0.58)	-0.86(1.67)	-7.48(2.33)**
3	1.11(1.73)	-5.68(1.73)	1.14(0.58)	0.15(0.58)	0.75(1.67)	-6.72(1.67)
4	0.36(0.58)	-5.32(1.15)	1.07(0.58)	1.22(0.58)	0.26(0.33)	-6.46(1.67)
5	-1.07(2.89)**	-6.38(2.31)**	-0.11(0.58)	1.11(0.58)	-0.99(2.33)**	-7.45(2.33)**
6	-0.60(1.15)	-6.99(1.73)	0.22(0.58)	1.34(0.58)	-0.59(1.00)	-8.05(1.67)
7	-0.21(1.15)	-7.19(1.73)	0.52(0.58)	1.86(0.58)	-0.17(1.00)	-8.21(1.67)
8	0.33(1.73)	-6.86(0.58)	-0.94(0.58)	0.92(0.58)	0.83(1.67)	-7.39(0.33)
9	-0.42(1.15)	-7.28(0.58)	-0.55(0.58)	0.37(0.58)	-0.30(1.00)	-7.68(0.33)
10	-0.94(1.73)	-8.22(0.58)	0.24(0.58)	0.61(0.58)	-1.06(1.67)	-8.74(0.33)
11	-0.92(1.73)	-9.14(1.15)	-0.12(0.58)	0.48(0.58)	-0.88(1.00)	-9.62(1.00)
12	-2.00(2.31)**	-11.14(1.73)	-2.37(1.73)	-1.88(0.58)	-1.60(1.67)	-11.22(1.67)
13	-1.52(0.00)	-12.66(1.15)	-4.65(0.58)	-6.53(0.58)	-0.57(0.33)	-11.79(1.00)
14	1.46(1.73)	-11.20(1.15)	-2.83(0.58)	-9.36(0.58)	2.35(2.33)	-9.44(1.00)

Note 1: The number in parentheses represented the Sign Z statistics

Note 2: \*  $p < .1$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

Comparing the above study results with public opinion and fluctuation in the number of spectators at each occurrence of CPBL match-fixing, it is evident that although the five match-fixing scandals severely undermined Taiwan's professional baseball and caused fans to lose confidence, not every match-fixing scandal had a significant negative impact on the abnormal returns of the parent companies or sponsors. This might be because of the history of professional baseball in Taiwan, public sentiment toward baseball and the special long-standing relationship between professional baseball teams and parent companies or sponsors. Hence, unlike the general enterprises cases, the negative spillover effect of the match-fixing scandals is not consistent or evident in the empirical results. This phenomenon corresponds to Taiwan's baseball history and cultural background, where the development of baseball teams began with ordinary people. Lacking government support, both players and spectators developed their own entertainment in baseball, which gradually became an important activity for the ordinary public. Hence a little betting was unavoidable, but limited to petty winning or loss. The nature of baseball is such that it often begins in a certain area or is promoted by particular people, so the interaction among the players often comprises interpersonal networks, resulting in a strongly personal baseball culture.

Table-6. The Test of AAR and CAAR of Title Companies and Sponsors in 2008 Black Elephants

Event date	Day	Title companies and sponsors (n=14)		Title companies (n=3)		Sponsors (n=11)	
		AAR(%)	CAAR(%)	AAR(%)	CAAR(%)	AAR(%)	CAAR(%)
October 26, 2009	-14	-0.13(0.00)	-0.13(0.00)	-0.04(0.00)	-0.04(0.00)	-0.29(0.71)	-0.29(0.71)
	-13	0.32(0.63)	0.19(0.00)	0.82(1.41)	0.78(1.41)	0.03(0.00)	-0.26(0.71)
	-12	1.30(1.89)	1.50(0.00)	1.93(1.41)	2.70(1.41)	1.13(1.41)	0.87(0.71)
	-11	0.02(0.00)	1.52(1.26)	-0.28(1.41)	2.43(1.41)	0.02(0.00)	0.89(0.71)
	-10	-0.79(1.26)	0.73(0.63)	0.63(1.41)	3.06(1.41)	-1.05(2.12)	-0.16(1.41)
	-9	-0.60(1.26)	0.13(0.63)	-0.45(0.00)	2.60(1.41)	-0.60(1.41)	-0.75(1.41)
	-8	1.13(0.63)	1.26(0.00)	1.33(0.00)	3.94(1.41)	0.98(0.00)	0.23(0.71)
	-7	0.28(0.63)	1.53(0.00)	-0.88(0.00)	3.06(1.41)	0.41(0.71)	0.64(0.71)
	-6	-0.61(1.26)	0.92(0.00)	0.21(0.00)	3.27(1.41)	-0.72(1.41)	-0.08(0.71)
	-5	0.32(0.00)	1.25(0.63)	-0.44(1.41)	2.83(1.41)	0.55(0.71)	0.47(0.00)
	-4	-0.68(1.90)*	0.57(0.00)	-0.08(0.00)	2.75(1.41)	-0.82(2.12)	-0.35(0.71)
	-3	0.07(1.26)	0.63(0.63)	0.08(0.00)	2.83(1.41)	0.16(0.71)	-0.19(0.00)
	-2	0.41(0.63)	1.05(1.26)	0.29(0.00)	3.12(1.41)	0.46(0.71)	0.27(0.71)
	-1	0.70(1.26)	1.75(1.26)	0.09(0.00)	3.21(1.41)	0.82(1.41)	1.08(0.71)
	0	-0.36(0.63)	1.39(1.26)	-0.57(1.41)	2.64(0.00)	-0.45(0.71)	0.64(0.71)
	1	-0.46(1.26)	0.93(0.00)	-0.89(1.41)	1.75(0.00)	-0.36(0.71)	0.28(0.00)
	2	-0.55(1.26)	0.38(0.63)	0.70(0.00)	2.45(0.00)	-0.80(1.41)	-0.53(0.71)
						<i>Continue</i>	

	3	0.18(0.63)	0.55(0.00)	0.28(0.00)	2.73(1.41)	0.11(0.71)	-0.42(0.71)
	4	-0.25(0.63)	0.30(0.00)	0.14(0.00)	2.87(1.41)	-0.38(0.71)	-0.80(0.71)
	5	0.13(0.63)	0.44(0.00)	-0.43(1.41)	2.43(1.41)	0.20(0.71)	-0.59(0.71)
	6	-0.48(0.63)	-0.04(0.63)	1.56(1.41)	3.99(1.41)	-0.77(1.41)	-1.37(1.41)
	7	0.60(0.00)	0.56(0.63)	-0.28(0.00)	3.71(1.41)	0.86(0.71)	-0.51(1.41)
	8	-0.27(1.26)	0.29(0.00)	-0.03(0.00)	3.68(1.41)	-0.28(1.41)	-0.79(0.71)
	9	0.88(1.26)	1.17(0.00)	-0.52(1.41)	3.17(1.41)	1.08(1.41)	0.30(0.71)
	10	0.53(0.63)	1.70(0.63)	0.00(0.00)	3.17(1.41)	0.47(0.00)	0.76(0.00)
	11	-1.03(1.26)	0.67(0.63)	-0.63(1.41)	2.54(1.41)	-1.20(1.41)	-0.43(0.00)
	12	0.04(0.63)	0.71(0.63)	-0.14(0.00)	2.40(1.41)	-0.06(0.71)	-0.50(0.00)
	13	0.01(0.00)	0.72(0.63)	0.56(1.41)	2.96(1.41)	-0.09(0.71)	-0.58(1.41)
	14	-0.36(1.90)*	0.37(0.63)	-0.04(1.41)	2.92(1.41)	-0.41(1.41)	-0.99(1.41)

Note 1: The number in parentheses represented the Sign Z statistics

Note 2: \*  $p < .1$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

#### 4. DISCUSSION

Therefore in baseball matches 50 to 60 years ago, rule violations were often due to human relationships. It is noteworthy that during that era, baseball was not a national interest; yet it was a projection of behavioral standards and a practice in moral education. Despite incidences of manipulation, not fixing matches remained an upheld principle. These attitudes were formed by the contemporary social and cultural attitudes and rooted in daily life. After 1970, Taiwan's Little League emerged, and when Taiwan won the Little League, Senior League and Big League championships, baseball naturally gained the status of national sport. Moreover, because of Taiwan's dangerous political and diplomatic situation, public feeling of inferiority resulted in the need for vindication through baseball championship. Hence baseball entered an era where winning the world championship became the ultimate goal, and winning and losing became of greatest importance to the public, and along with it, unscrupulous gamblers infiltrated baseball to control the matches, plunging baseball in the beginning of a crisis.

Moreover, in the cultivation of ball players, the development of a secondary expertise and moral education were neglected in favor of game performance, and the attitude that nothing else but the number of gold medals matter became the sole criteria in evaluation. Yet the path of a gold medalist may not be smooth sailing. Some players successfully leave the profession to transition into a new career, but others go astray and sink into decadence. Sometimes in the face of corrupt match-fixers, even guileless players become involved in collusion incidents. Although professional baseball was established in Taiwan after 1990, it was not a stable profession. The professional life span of the players is limited, yet they lack the expertise for transitioning into another profession. Moreover, the relational network, personal involvement and gambling for amusement characterizing Taiwan's baseball gradually resulted in players being unable to extricate themselves from the threats and inducements of gamblers. Baseball became distant from moral character, and naïve players become instruments for crime. The inability to detach from personal relationships is founded in the historical and cultural characteristics of baseball, and these relationships have instead become today's network for illegal activities.

#### 5. CONCLUSION

This study is a financial analysis using event study to determine the impact of match-fixing scandals in professional sports. Through analysis of relevant secondary financial data collected from parent companies and sponsors of professional baseball teams, the impact and duration of match-fixing scandals on the abnormal returns of parent companies and sponsors were examined. Post perspective of the match-fixing scandals have revealed important factors, such as market size and limited player salary due to apparent lack of efficiency in the baseball

union, the character and moral nurturing of the players, ineffective management, anti-fraud and investigative capability of the CPBL in Taiwan's professional baseball environment, that likely caused repeated gambling incidents. However, the empirical results showed that the impact of each match-fixing scandal on the abnormal returns of parent companies and sponsors is not strong and inconsistent. Theoretically, this study integrated sports ethics, marketing and financial theories to empirically verify the economic impact of match-fixing scandals, and specifically analyzed the financial dimension of sports ethics incidents. The study results can help clarify the relationship between match-fixing scandals in professional sports and capital market, providing both theoretical perspective and empirical evidence for further study in Taiwan's current professional sports ethics and sports finance.

This study analyzed professional sport, sports ethics, marketing and finance, and the study results provided management strategy implications for professional sports operators, teams, players, sports marketing manager, operators of listed companies and investors. For professional sports operators, insight into the impact of match-fixing scandals can inspire improvements in the CPBL and mechanisms for preventing fraud, and reconsideration of the mutual benefit between teams and parent companies or sponsors. For parent companies, although this study did not find strong evidence to support that the match-fixing scandals have a spillover effect on the stock abnormal returns of parent companies and sponsors, for pursuing the benefits of actively sponsoring professional sports, corporations should still pay attention to coping strategies for reducing the financial impact of match-fixing scandals. For professional teams and players, this study is valuable for re-awakening sports ethics and spirit. Investors can also generally determine if a negative sports incident is a market indicator, and make investment decisions accordingly.

Although this study is a preliminary analysis of the impact of match-fixing scandals in professional baseball on the abnormal returns of parent companies and sponsors, it can promote the development of multi-discipline models and sports research, and strengthen the research foundation for Taiwan's professional sports. However, because many of the sample companies are foreign enterprises or unlisted, and the CPBL and official secondary data bases were incomplete, collection of secondary data was difficult, resulting in reliability issues in the analysis and the possibility of missing some critical influencing factors. Furthermore, the study results generated 14 days before and after the incident might only reflect individual players or teams. In addition, although short term effect on the abnormal returns of parent companies and sponsors was sporadic, long-term spill-over effect is yet to be revealed. Hence further study can focus on the repeated verification of a single negative incident, and deduce its specific antecedents and consequences. A time series analysis method may also be considered to analyze the lingering effect of gambling or match-fixing scandal in professional baseball to better elucidate the long-term perspective of capital market on match-fixing scandals in professional baseball.

**Funding:** The author would like to thank the Ministry of Science and Technology of Taiwan for financial support. Grant no.: MOST 103-2410-H-156 -017.

**Competing Interests:** The authors declare that they have no competing interests.

**Contributors/Acknowledgement:** All authors contributed equally to the conception and design of the study.

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