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Sentiment, irrationality and market efficiency: The case of the 2010 FIFA World Cup

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ABSTRACT

Soccer games create sentiment, which affects stock prices. The World Cups before 2010 provided exploitable abnormal profit which was not exploited, presumably because it was unknown. Just before the 2010 World Cup, the exploitable effect has been discovered and widely cited by practitioners who even suggested recipe how to exploit it. Indeed, the information on the abnormal profit created in 2010 World Cup a price pattern which is different from those corresponding to the previous World Cups. Like other market anomalies, we expect that market efficiency will be restored and this new effect will vanish in the future.

1. Introduction

Psychologists and behavioral economists have shown that sentiment and mood affect choices, which in turn, affect stock prices. The empirical evidence that sentiment and mood affect asset pricing, and thereby may provide a free lunch, directly challenges the classic asset pricing models. However, these free lunches, if they do exist, tend to disappear once they are publically known. In a comprehensive study, Schwert (2003) finds that the size effect and the value (earnings-to-price) effect have disappeared sometime after they were published. Although causality is not proven, he notes that at about the same time, practitioners have begun employing investment vehicles that implemented the strategies implied by these effects. Schwert also finds that the weekend effect and the dividend yield effect have lost their predictive power and the turn-of-the-year effect became weaker in the years after it was first documented. He raises the possibility that the activities of practitioners who implement strategies to take advantage of anomalous behavior may cause the anomalies to disappear. Thus, the market may be inefficient due to a sentiment effect, but efficiency is restored once the information on the market effect becomes public and sophisticated investors design investment strategies aiming to exploit it.[2]

This study is devoted to the discovery of a relatively new free lunch opportunity in the stock market, and to the process by which market efficiency is restored, once it has become public information. We analyze the market effect of soccer games,[3] focusing on the recent discovery of the FIFA World Cup's exploitable effect, which provides a free-lunch opportunity. Having the information on this free lunch, which was publicly available just before the 2010 World Cup began, we analyze the relation between sentiment, information flow, and market efficiency by comparing the World Cup effect before and after the discovery of the effect.

Our analysis differs from Schwert (2003) and others mainly with the type of the explored effect. Unlike market anomalies that relate

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[2] Analyzing momentum, profitability, value, earnings and reversal effects Akbas et al. (2013) find that the degree of cross-sectional efficiency varies across time due to time-varying constraints to arbitrage capital. Thus, constraints to arbitrage capital also affect the extent by which efficiency is restored.

[3] While in most countries this sport is called football in the U.S. it is called soccer to distinguish it from American football.

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to many relatively small systematic cross-section return deviations from what is expected by theoretical models, we investigate a long-lasting, relatively large and rare event effect. Thus, in our case the effect directly relates to behavioral effect whereas many other anomalies, albeit not all of them, are either not fully explained or possibly have technical or even economic explanations. Second, we investigate a large, long-lasting effect which is relatively easy to exploit even by individual investors who face high transaction costs, let alone by institutional investors. Therefore, there are high chances that investors try to exploit the effect. Finally, as the effect occurs only once every four years, we are able to isolate the market behavior that accompanied the event and to scrutinize it on a day by day basis. On the other hand, however, at this stage we have only one event that occurred after the effect was published. We try to overcome this problem by working at a daily resolution, which takes advantage from the relatively long lasting effect. Nevertheless, it is an interesting case study and further investigation in the future is called for, when more data on the event will be available.

The FIFA World Cup effect was discovered in 2008 and published in April 2010, just before the 2010 World Cup. While over a period of 56 years the market was highly inefficient during the World Cups, the new information about the sentiment effect, which became public just before the 2010 World Cup, increased market efficiency. We find that although a free lunch was still available during the 2010 World Cup, the stock market behavior with the new information was substantially different from that without it. To ensure that the observed results are not due to released economic news which has nothing to do with the World Cup we also carefully analyze the released economic news during the 2010 World Cup and its possible effect on stock prices. Based on these results and consistent with the market efficiency paradigm we speculate that the World Cup free lunch will not persist in the future because sophisticated investors will fully exploit it.

The structure of this paper is as follows: Section 2 briefly presents the FIFA World Cup effect while reviewing the relevant literature. Section 3 analyzes the stock market prices during the 2010 World Cup period, showing that the price behavior was indeed different from that during the previous World Cups. Section 4 concludes.

2. The World Cup effect before 2010

Numerous studies show that investor sentiment affects asset prices (see, e.g., Baker and Wurgler, 2006; Lamont and Stein, 2006), implying that free lunches may sometimes still exist. Saunders (1993), Hirshleifer and Shumway (2003) and Kamstra, Kramer, and Levi (2003), for example, show that climate-related non-economic factors, which affect investors' moods and health are significantly correlated with market returns. Kaplanski and Levy (2010a) show that the media coverage of large-scale aviation disasters significantly affects investor sentiment which, in turn, affects market prices.

This study analyzes some irrational investment choices and the role of sophisticated investors in restoring market efficiency, once the information on a potential free lunch is available. A market anomaly does not necessarily offer a free lunch. If there are limits to arbitrage, due to transaction costs, the risk involved with exploiting the anomaly, etc. then there is no free lunch and the anomaly may persist (De Long et al., 1990; Shleifer and Summers, 1990; Shleifer and Vishny, 1997). In such cases, the market is inefficient but it is operationally efficient. However, if one can exploit the anomaly to make abnormal profits; then, according to the market efficiency hypothesis, market mispricing is expected to disappear. Thus, following De Long et al. (1990), Shleifer and Summers (1990), Shleifer and Vishny (1997) and others we assume that the market is comprised of noise traders whose choices are affected, among other things, by moods and sentiment as well sophisticated investors who exploit the market's free lunches induced by irrational investment choices, if they exist, and thereby making them disappear.

To analyze the effect of the flow of information corresponding to the World Cup effect on market efficiency, it is beneficial to first briefly discuss this sentiment effect before it was discovered. Edmans, García, and Norli (2007) find a strong association between results of important soccer games and local market stock returns. Investigating 39 stock markets, they find an asymmetric effect, where losses have a significant negative effect in the losing countries' local markets, but victories do not have a significant effect in the winning countries' local markets (for supporting evidence in the U.K. market, see Ashton, Gerrard, and Hudson, 2003[4]). As the effect lasts for a single day and as the result of the game is unknown, transaction costs probably wipe out abnormal profits in the local markets and this anomaly may persist even after being discovered.

Utilizing the asymmetry of the effect, Kaplanski and Levy (2010b) develop a practical method to exploit the effect which *ex-post* has been found to be highly profitable and dominating the buy-and-hold strategy. They show that the soccer negative sentiment effect creates a long-lasting negative effect during the FIFA World Cup, which is exploitable in the U.S. market. Their main hypothesis asserts that during the World Cup period there is a global negative effect induced by all losing countries' hundreds of million fans. Therefore, they propose to exploit the global effect in the U.S. market, which is the most global market in the world, where about one-third of the transactions involve non-U.S. investors. Because with each round of the World Cup the number of losing countries increases, they argue that the aggregate negative sentiment effect on the U.S. stock market is substantially larger than the local market effect, as this market is affected by all games and by investors from all losing countries, which eventually incorporate hundreds of millions of fans from several dozens of countries. Moreover, the effect lasts for a long period of about one month during which the World Cup games are played. A second reason to exploit the effect in the U.S. is the fact that this market is probably unaffected by unknown results of the U.S. team, as soccer is not very popular in the U.S. This critical issue is what makes the effect exploitable, as in markets where soccer is very important the negative effect depends on the results of the local team in the games which are unknown in advance. Only the U.S. market on the one hand is not affected by its own team and on the other hand, is affected by investors from all over the world. Finally, the U.S. market is a very liquid market with relatively low transaction costs. Thus, in the U.S. market this effect offers a free lunch which remains profitable after accounting for transaction costs; it does not depend on the games' results; it is a large effect in terms of profits after transaction costs; the effect lasts for a long period of time during which the World Cup games are played; and finally, it involves trading in a single stock index, which is highly liquid.

Exploring 15 World Cups from 1950 to 2006, Kaplanski and Levy find that the average return during the World Cup period was −2.58%, compared to +1.21% for all-days average return over a similar period length. Thus, investing $1 in the stock market in January 1950 yielded $4,386 by the end of 2007, whereas shifting from

[4] Closely related to this subject, Kavetsos and Szymanski (2010) explore the effect of hosting the World Cup games on general feeling, and Berument and Yucel (2005) explore the association between the soccer team performance and industrial production.