

**Cricket, Colonialism and the Capital Market:
Winning Does Not Matter but Losing Hurts**

By

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Abstract

There is increasing evidence of the inadequacy of 'rational' explanations of asset-pricing. It has been established empirically that mood, induced by such natural phenomena as lunar phases or sunshine, affects asset prices. This paper provides evidence, from one-day cricket international (ODI) matches played by India, that there is a significant negative impact on the daily stock market returns when the national team loses. Empirically, losing in India matters somewhat more than losing outside. The mood induced by losing a match appears to be conditioned by history, in that losing to nations that represent the 'colonizers' matters but not losing to nations that share India's experience of being 'colonized'.

Cricket, Colonialism and the Capital Market: Winning Does Not Matter but Losing Hurts

"The members sat in their strong deckchairs
And sometimes glanced at the play,
They smoked, and talked of stocks and shares,"¹

Introduction

There is growing body of literature; both theory and evidence, on investor psychology based explanations for the pricing of financial assets. Hirshleifer (2001) provides a current, comprehensive, review of this literature. A sub-set of this approach to asset pricing addresses the consequences of mood on asset prices. Empirical evidence includes the influence of lunar phases (Yuan et al., 2001) and sunshine (Hirshleifer and Shumway, 2001).

This paper provides evidence, from one-day cricket international (ODI) matches played by India, that there is a significant negative impact on the daily stock market returns when the national team loses. Empirically, losing in India matters somewhat more than losing outside. The mood induced by losing a match appears to be conditioned by history, in that losing to nations that represent the 'colonizers' matters but not losing to nations that share India's experience of being 'colonized'.

ODI cricket matches are arguably a national obsession in India, and while each victory seemingly lifts the nation's mood, each defeat is followed by much breast-beating. The 315 matches played by India in the 12-year period, 1990-2001, provide an ideal testing ground for the hypothesis that mood actually does impact security prices.

The paper is organized as follows. Section 1 provides a review of the investor psychology literature, and builds a case for the importance of cricket in India. This is used to develop the broad hypothesis that winning or losing an ODI matters. Section 2 deals with data. Section 3 contains the analysis and results. Section 4 concludes the paper.

1. Literature

My empirical focus in this paper is on the relationship between ODI match results and stock market returns. While essentially intended as a positive research, I propose the following causal model. Winning or losing an ODI match alters the mood of an investor. Mood states can influence cognition, and cognition in turn 'biases' asset prices. Alternatively mood can modify subjective preferences of investors, leading to a revision of asset-prices. Mass communication, especially television, has a major influence on mood. Also all victories and all defeats are not the same. Victory and defeat influence mood in the context of India's current and historical relationship with the opponent nation. The literature survey, therefore, covers mood and media influence; and cricket, both as a game and as a repository of historical relations between nations.

¹ "Cricket at Worcester: 1938," by John Arlott (Guha 2001).

A pioneering discussion of human behavior on financial markets is in the mid-nineteenth century classic by Mackay (1932). The book, rich in description and detail, highlights what would currently be described as the 'social interaction' effect (Hirshleifer 2001) on valuation in financial markets².

Moving 160 years forward, the survey by Hirshleifer (2001) classifies individual psychology based explanations for asset-pricing into heuristic simplification, self-deception, emotions and self-control, social interactions, and modeling alternatives to expected utility and Bayesian updating. Explanations based on emotion and self-control are further classified into three sources: distaste for ambiguity; mood, feelings, and decisions; and time preference and self-control. Mood is the subject matter of the research here.

Cohen and Areni (1991) distinguish between emotion and mood, both examples of affect, where affect is a "general descriptor of a valenced feeling state." Emotions are "more intense and stimulus specific than moods ... Moods, on the other hand may be elicited and maintained without conscious awareness of the feeling state, its cause, or its influence on current activities." An application of their definitions and illustration to ODIs would be as follows. Immediately, after the loss of a match an Indian supporter may feel upset with Indian players, angry about umpiring decisions, and experience other emotions. A little while later he may be in a bad mood and remain so for the rest of the day or perhaps longer.

Mood states can bias cognitive activity, both at the time of encoding and at the time of retrieval. Encoding works as follows. An individual exposed to both positive and negative information while in a positive mood will recall more of the positive information subsequently (Bower et al. 1981). With retrieval an individual who has learnt a list of positive, negative, and neutral words, will recall more positive-trait words if he has just succeeded, say, in a computer-game (Isen et al. 1978). An individual in a positive mood may report higher levels of performance. If an investor is assumed to process firm and market information before taking a trading position, retrieval would explain a downward bias (over-emphasis on negative information) in a negative mood, and a corresponding upward bias in a positive mood.

However, Gardiner and Hill (1988) propose that an individual in a good mood will chose an experiential decision strategy and an individual in a bad mood will chose an informational strategy. This would imply that an individual in a negative mood would come close to the efficient' price. But there is no reason to expect that experiential strategies will result in prices systematically different from those set by informational strategies.

Apart from the cognition route, mood can influence subjective preferences. Mehra and Sah (2000) formulate the impact on equity prices of changes in the discount rate and the level of risk-aversion. Two assumptions they make are of relevance here. The first is that an individual's subjective preference fluctuates over time. The second is that these fluctuations are correlated across particular groups.

² Mackay moves seamlessly from financial markets to alchemy, to witchcraft, and to the crusades with almost no loss in continuity, and with a sense that these are inter-related issues.

The mass media, especially television, can have a strong influence on viewers. O'Guinn and Faber (1991) provide a review of metatheories concerning the processes, uses, and effects of the mass media. Goldberg and Gorn (1987) examined the reaction to embedded advertisements in either happy or sad TV programs. Those viewing the happy programs were happier. Of various metatheories cultivation is of interest here. Cultivation theory proposes (O'Guinn and Faber), in the context of television, that "the more one views, the greater the likelihood one will perceive the real world to be similar to the way things are on television." This logic can be extended to an individual in India who watches seven hours of cricket. An Indian victory or defeat has the distinct possibility of coloring his world-view in other contexts including, possibly, in asset-pricing.

Evidence on the influence of mood on financial markets has been provided by Yuan et al. (2001), and by Hirshleifer and Shumway (2001). Both invoke natural phenomena as the primal cause of mood. Yuan et al. (2001) examine the impact of a completely predictable natural phenomenon, lunar phases, on market returns. The impact is significant in most developed economies and in a sizeable proportion of developing economies. The Indian evidence reported by Yuan et al. is that lunar phases make no significant impact on the Indian stock market returns³. Hirshleifer and Shumway (2001) examine the impact of sunshine and find that it matters. Common to both papers is a hypothesized 'good' mood state (new moon/more sunshine) and 'bad' mood state (full moon/less sunshine).

At the core of my broad prediction that ODI match outcomes affect the stock market, lies the importance of cricket in India. The obsession with cricket in India is mind-boggling. Up to 100,000 spectators would watch a match in Kolkata. Television audiences number several million for a typical match. In terms of television viewership ratings (TVRs) and audience share, cricket is significantly ahead of other programs⁴. Repeats of previous matches and obsessive analysis by experts, quizzes and other cricket-centric game shows, fill up TV time. Daily newspapers report cricket extensively, as do magazines. A match won by India will lead to celebrations, a loss to deathly silence and the occasional riot. It is customary, if India wins a series, for the Prime Minister to congratulate the team. Suspension of Indian players in a 5-day test match, led to questions in Parliament, and diplomatic pressure on South Africa. While a lot of cricket is played in India, at all levels of the game, audience interest is restricted to international matches. Domestic cricket matches audiences have reduced from 30,000 to negligible numbers over the last two decades.

Why are Indians obsessed with cricket? I will develop my arguments for this in three parts. The first is economic, the second physical fitness, and the third the 'colonial' heritage. The first two are enabling arguments that cricket can be played, the third

³ This is unsurprising, and I would hesitate to conclude that investors in the Indian market are unaffected by lunar phases. The traditional Hindu calendar or *panchang* is essentially lunar based. There is not a dichotomous belief that the full moon is inauspicious and the new moon is not. But it has a complex structure of auspicious and inauspicious time intervals that cannot be captured by a sinusoidal function.

⁴ For instance in the week ended February 3, 2002 the India-England ODI had the highest TVR of 10.3 (the program with the second highest TVR, a popular soap, had a TVR of 7.9). Cricket had a 29.3% of the all-India prime-time market share (The Economic Times, Bangalore, 20th February 2002).

focuses on the introduction of cricket in India. None of this quite captures the magical attraction of cricket but will have to suffice.

Cricket, as a game, is in many ways unique⁵. In a sense, it is a vestige of British colonialism and is popular only in a few countries, England and its former colonies. It is also perhaps the only game where time does not matter. Till the early 1970s the standard international version was the 5-day test match. Since then, the briefest form is the ODI, played over roughly seven hours either in daytime, or as a day/night match starting in the afternoon and ending late evening. While matches are played all days of the week, a greater proportion is played on weekends. Cricket, even at the highest level, calls for insignificant individual investment in sports-gear. Except for real estate, it is an inexpensive game. Even the real estate constraint is easily overcome, with a lot of cricket at the formative years literally played on the streets, often with used tennis balls. No synthetic surface is used even on international cricket grounds.

In the last decade the Indian sub-continent (India, Pakistan, Sri Lanka, and Bangladesh) has provided much of the audience, both at the grounds and on television. India in particular has become the economic power house of international cricket. Television rights for a six-year period for the Indian sub-continent were recently valued at \$375 million⁶. The analysis used by Becker (1965), on the cost of time, can be applied to partly explain this. The value of foregone earnings in India is low. The opportunity cost of leisure time⁷ spent on watching cricket on weekdays, during working hours, is low; and even lower on weekends and evenings⁸. The cost of playing cricket is also low, both in terms of game-related costs and opportunity costs. The importance of this can be seen in the decline of field-hockey. This, apart from cricket, was the only game or athletic event, where India had international successes. But the introduction of the expensive artificial turf playing surface has been a major factor in its decline. India has a handful of stadia with artificial turf, compared with much smaller nations such as the Netherlands⁹. Physical fitness, in which India is a laggard, matters much less in cricket than in most sports¹⁰. The Indian cricket team had a rating of 11.5 on the Multi-Stage Fitness Test, the so-called 'bleep' test. The hockey team had a rating of 17.¹¹ While the opportunity cost of time and fitness explain in part the Indian affection for cricket, there are obviously other factors.

A major influence has been the imperial and colonial experience. Said (1994) makes the distinction between imperialism and colonialism. "Imperialism' means the practice, the theory, and the attitudes of a dominating metropolitan centre ruling a distant territory;

⁵ A quick description of the game can be found at http://www.epinions.com/content_2098176132.

⁶ The Economic Times, Bangalore, 16th February 2002.

⁷ There is also a traditional Indian preference for epic-length entertainment. The Yakshagana, Ram-Leelas, scriptural discourses, classical music performances have in common a disregard for the value of time.

⁸ Governments may reduce the opportunity cost. Recently, a court dismissed a public interest litigation case challenging the decision by the government of the state of Tamil Nadu declaring a holiday on the day of an India -England ODI (The Hindu, Chennai, 24th January 2002).

⁹ This is an example of where a physically level field is not an 'economically' level field.

¹⁰ An Indian batsman, CK Nayudu, played his last match at first-class level at the age of 61 (Guha 1992). "Despite modern training regimes this could still be a game for rotund men," ("David slays Goliath," Mike Marqusee in Guha 2001).

¹¹ Some of the finest members of the team reportedly failed scoring below 11.5 on the 'bleep' test. (<http://www.rediff.com/cricket/2001/feb/15diary.htm>).

'colonialism' which is almost always the consequence of imperialism, is the implanting of settlements on distant territory." I will use colonialism as shorthand for both colonialism and imperialism. The hypothesized influence of colonialism leads to a subsequent classification of teams that played ODIs with India into 'colonizers' and the 'colonized.'

There are two broad sets of process related to colonialism and cricket. The first process concerns the introduction of cricket¹² in the colonies. The second relates to the use of cricket, by the colonized. In explaining the introduction of cricket, McClendon (1998) elaborates on Nandy's argument that "the emerging culture of cricket came in handy to those using (post-Utilitarian) theories to hierarchize the cultures, faiths and societies which were, one by one, coming under colonial domination." McClendon argues that cricket was perceived to reflect values such as sportsmanship, dash, courage and temperament. "Cricket was through and through a gentleman's game, and all others were excluded by their inability to demonstrate an understanding of cricket's image of an ideal Englishman." CLR James provides an understanding of cricket in the colonial framework. For him the style of play of black West Indians is itself a form of social resistance against British colonialism. The great West Indian all-rounder, Sobers is considered by him to be "a living embodiment of centuries of tortured history." For Nandy (see McClendon), cricket like Christianity allowed Indians to assess the British by the officially declared values, and in both cricket and Christianity the rulers were found wanting.

This colonial influence resulted in cricket remaining an aristocratic game¹³ till post second-world war. The vestiges are still seen in Indian domestic cricket. Several decades after the nation was re-organized into states on a linguistic basis, former princely states such as Baroda, Saurashtra and Hyderabad send teams to the Ranji Trophy (the national level cricket tournament consisting otherwise of the re-organized states.) The game's highest authority, the International Cricket Council, often shows signs of this colonial influence. This body started life as the Imperial Cricket Conference in 1909 with England, Australia, and South Africa as founding members. It has had two chief executives, both Australians, since the post was created in 1993. Only one Indian has ever been its President. England, Australia, South Africa and New Zealand are perceived by the other nations as having an undue influence on the game's administration. India, Pakistan¹⁴, Sri Lanka and the West Indies are nations that see themselves as having less than warranted influence on the game¹⁵. The intense reaction to the recent suspension of Indian players, I referred to earlier, was derived in part from the perception that double

¹² "First the hunter, the missionary and the merchant, next the soldier and the politician, and then the cricketer – that is the history of British colonization. And of these civilizing influences the last may, perhaps, be said to do least harm." Cecil Headlam quoted in Guha (2001).

¹³ In 1932 Indian team, touring England, was captained by the mandatory aristocrat. In this tour, the captain, His Highness The Maharajah of Porbandar, an opening batsman, ended with a tour average of 1.14 runs ("The unmasking of a dashing oriental star," Alan Gibson in Guha 2001)

¹⁴ The typical CNN description of India and Pakistan as 'arch-rivals' has exceptions. When the two teams play each other there certainly is rivalry, however they show congruent interests in game administration. Thus when New Zealand called off a tour of Pakistan, India has threatened to cancel its proposed tour of New Zealand in retaliation. Concurrently India maintains the position that it will not play with Pakistan.

¹⁵ The Hindi movie *Lagaan*, culminating in the victory of a rural Indian cricket team over the colonial rulers, won several awards in India (was shortlisted for the foreign film Oscar), and made significant money.

standards are applied to Indian players¹⁶. The domination of cricket economics has increased the influence of the sub-continent nations¹⁷. South Africa is interesting, in that the nation itself now clearly belongs to the other side of the divide, but the team does not. I will describe these two groups as the 'colonizers' and the 'colonized'.

Cricket has not been subjected to much analysis by the 'management' discipline¹⁸. Capital market studies of sports include Renneboog and Vanbrabant (2000). They show that share price of listed soccer clubs react positively (negatively) to victory (defeat). However, promotion and relegation within a league results in larger abnormal results. They also show that investment in soccer clubs under-perform the market in terms of risk-adjusted returns. Their research is in the rational framework.

Given that cricket looms large in the life of an Indian, I believe that victory or defeat would alter market participants' moods enough to matter.

The 5-day test match is informationally leaky, in that while a match may actually be lost on the fifth day; the outcome of the match may be reasonably certain by the fourth day, or even earlier. Therefore, an empirical test of the hypothesis that cricket match outcomes impact the market is difficult to set up. Hence I have focused on ODIs. An ODI is usually a 50 overs per side match. The team batting first achieves a score in its innings. The second team has to surpass this score to win in its allotted 50 over innings. ODIs can also be informationally leaky, in that a very low or very high target score set by the team batting first can make the result of the match more predictable. However, and it from this that spectator value is derived, in most matches the result is determined at the very end or close to the end. And what makes an ODI valuable for research is that it gets over in a day.

2. Data

ODI match results were taken from the web site howstat.com. The market was represented by a stock exchange index. The stock index chosen was the Bombay Stock Exchange (BSE) Sensitive Index (Sensex) of 30 securities. This is a market capitalization weighted index of actively traded stocks. The Prowess data-base of the Centre for Monitoring Indian Economy provides daily Sensex values.

The focus of attention was on daily Sensex return $[\ln(P_t/P_{t-1})]$ on the 'event' days, the day that an ODI result was available in India; and, therefore, the day the match result could influence the stock market.

Event days were determined as follows. Trading on the BSE takes place between 10.00 a.m. and 3.30 p.m. local time (5 hours and thirty minutes ahead of UCT-Universal

¹⁶ See "It's old world versus new world," Nirmal Shekar (Sportstar, Chennai Vol. 24 No. 48 December 2001).

¹⁷ The recent incident in South Africa, mentioned earlier, is in many senses yet to be resolved. The postures taken by cricket playing nations are consistent with this classification.

¹⁸ A rare study is the application of dynamic programming to the issue of when, during an over, should the stronger batsman take a single run in order to 'protect' the weaker batsman (Clarke and Norman, 1998).

Coordinated Time). A daytime ODI played in India would end after trading hours, roughly around 5.00 p.m. A day/night ODI would end roughly around 10.00 p.m. The results of ODIs played in India, at the same longitude as India, or further west (Sri Lanka, Pakistan, Sharjah, South Africa, Zimbabwe, England, West Indies, and Canada) are assumed to impact the following day's index. In matches played in these venues, the day following the match day is the event day.

A daytime match, played in Melbourne, Australia would affect the same day's prices, while a day/night match there would affect the following day's prices. Melbourne, and several other Australian venues (Brisbane, Sydney, and Hobart, Tasmania) are 10 hours ahead of UCT. Adelaide and Perth, in Australia, are nine and a half-hours, and eight hours respectively ahead of UCT.¹⁹ Event days for matches played significantly east of India in Australia and New Zealand, were determined using this each match's timings. Event days for matches played just east of India in Bangladesh and Singapore were determined similarly based on each match's timings²⁰.

India played 315 ODIs between 1st January 1990 and 31st December 2001. Of these, three matches were tied, and there were no results in 12 with matches abandoned, usually because of rain. These matches were excluded, leaving 300 matches with a win/lose result. I had to exclude 63 other matches because of exchange closures. The BSE is a holiday prone exchange. Trading took place annually, on an average on about 225 days, in the 12-year period.

I used the following protocol to drop matches played on intervening exchange holidays. If, say, two successive matches were played on a Saturday and Sunday (or other intervening exchange holidays) and India won one and lost the second, I excluded both matches. If India won both or lost both, I treated this as one match won or one match lost. 17 matches are in the sample as a result of applying this treatment to successive Win/Lose or Lose/Win (dropping even these 17 made no difference to the study results, but it appears to make sense to retain them).

This left 237 matches, of which India won 118 and lost 119. Out of the 300 matches with a win/lose result in the study period, India won 149 and lost 151. Thus exclusion of matches has not altered the proportion of win/lose outcomes.

The basic hypothesis tested was that winning an ODI will have a significant positive impact on the market return, losing a ODI will have a significant negative impact on the market return.

A second set of hypotheses related to the location of a match. The first issue on location relates to whether the match is played in India or outside. Matches in India and outside are hypothesized to have differential impacts on the market return. The differential was hard to get a fix on theoretically since two factors play a role in this differential impact. The first is that India has a larger proportion of wins in matches played in India compared

¹⁹ To compound matters daylight saving time is uniform in the same longitude. Brisbane uses daylight savings time, but not Melbourne, Sydney, and Hobart.

²⁰ What is available in TV programme listings are scheduled timings, the match could have ended earlier than that or been prolonged. I have used newspaper reports to verify the time of completion.

to those played abroad. 83 matches were played in India with India winning 66.26% of these. India won only 40.91% of the 154 matches played outside India. Thus the *a priori* probability of winning a match in India and losing a match outside is high. Losing a match in India or winning one outside should be a 'surprise.' A second factor is physical presence. There are a large number of 'home' spectators in a match played in India, and TV broadcasts beam the spectator reaction to viewers. I, therefore, chose not to hypothesize the impact of location on market returns, but will provide empirical evidence.

A second issue on location is Sharjah (a constituent of the United Arab Emirates). In the last decade, a number of ODIs have been conducted in this 'neutral' venue. The audience includes sizeable expatriate Indians and Pakistanis. The Government of India intervened in 2001, and has prohibited Indian participation at Sharjah. I also test the impact of playing at Sharjah.

The final set of tests will focus on matches with specific opponents. First, winning or losing matches with the 'colonizers' matters more than with the 'colonized.' Australia, England, New Zealand and South Africa are in the 'colonizer' category. Sri Lanka, Pakistan and West Indies are major cricket playing nations in the 'colonized' category.²¹ India has won only 39.58% of matches played with the 'colonizers' in contrast to the 56.73% of matches won playing with the 'colonized'. Testing this colonial hypothesis would also help understand the impact of the 'surprise' factor. Second, given the troubled history of relations with Pakistan, I hypothesized that winning and losing matches with Pakistan, matters more than with other teams. The empirical test needs to resolve essential contradictory hypotheses involving Pakistan.

3. Analysis and Results

Two tests were carried out to test the first hypothesis that winning will have a positive impact and losing a negative impact on market returns. The tests here are similar to this in Ariel²² (1990) and Yuan et al. (2001).

The first is a chi-square test, on the proportion of positive returns (advances) and negative returns (declines). For wins this compared the proportion of positive and negative returns on the 118 win event days with the proportion on the 2464 days non-match days. A similar test was carried out for the 119 loss event days. Winning does not have a significant impact while losing has a statistically significant negative impact (Table 1, Panel A). The proportion of positive returns is significantly lower on the match loss event days, compared to the proportion in the non-match days.

Table 1 about here

²¹ Zimbabwe can not be labeled easily. I am placing it in the 'colonized' category, but will also report results with Zimbabwe excluded.

²² Ariel shows that the trading day prior to a holiday exhibits high positive returns. He has not invoked and I will not attribute to his findings, sorely tempted as I am, the explanation that mood is a cause of high pre-holiday returns.

A second test is a standard difference of means t-test. For wins this tested for the difference between the mean return on the 118 win days, against the mean return on the 2,464 days when no matches were played. A similar test was carried out for the 119 loss event days. No adjustment for auto-correlation was made. The results are identical to those with the chi-square test²³. Winning does not have an impact, while losing has a statistically significant impact (Table 1, Panel B). Returns on the match loss event days are significantly lower than on the days when matches were not played. Risk, based on standard deviation, does not appear to have altered materially.

With this result that losing matters, results for location are reported in Table 2. For matches in India both the chi-square and difference of means tests support the previous finding that losing has a negative impact (Table 2, Panels A1 and B1). However, for matches played outside India the results are ambiguous (Table 2, Panels A2 and B2). The t-statistic supports the conclusion that losing makes a difference, but the chi-square does not²⁴.

Table 2 about here

Out of the 237 matches in the above sample, 234 are available for testing the colonization hypothesis. Recollect that successive wins or losses during intervening exchange holidays were treated as a single win or loss. For the colonization hypothesis I am also discarding successive wins or losses involving opponents from both the 'colonizer' and the 'colonized' categories. This protocol resulted in three matches being dropped. Losing to the 'colonizers' is statistically significant (Table 3, Panels A1 and B1). Losing to the 'colonized' nations is not statistically significant (Table 3, Panels A2 and B2)²⁵.

Table 3 about here

Given the small number of matches involved,²⁶ only the chi-square test (results not reported here) can be used for matches with each major cricket-playing nation. Only losing to Australia and South Africa²⁷ mattered. Losing to Pakistan does not have a significant impact.

A separate test was carried out to see whether any day-of-the-week effect contaminated the conclusions. Karmarkar and Chakraborty (2000) report a Friday effect on the Indian stock market. The daily index returns were regressed with loss event day assigned dummy values (1 if loss, 0 otherwise). As before losing has a significant impact (Table 4,

²³ As Ariel (1990) observes the chi-square statistic, unlike the t-statistic, ensures that conclusions are not based on a small number of very high returns on event days.

²⁴ There is no Sharjah effect. With only 36 matches played in Sharjah, only the chi-square is appropriate. The chi-square values are not significant.

²⁵ Excluding Zimbabwe from the 'colonized' list made no difference.

²⁶ The sample of matches studied contained over 30 matches each with Australia, Pakistan, South Africa and Sri Lanka; over 20 matches each with New Zealand and Zimbabwe; and only 6 matches with England.

²⁷ The chi-square statistic for losing to Australia was high, but since one cell (lost match and positive returns) contained only 4 observations, the result is of borderline significance.

Panel A). The regression is repeated with the addition of day-of-the-week dummies to the 'lose' dummy (Table 4, Panel B). The previous conclusion remains.

Table 4 about here

4. Conclusion

The empirical evidence broadly supports the hypothesis that mood matters with three insights. The first, strong, insight is that gloom arising from a defeat has a more significant impact than euphoria generated by a victory. The next insight has a weaker basis and is based on the evidence that defeats in India matter significantly, while defeats outside have less significant consequences. This, second, insight is that gloom with a visible physical presence outweighs distant gloom. I am not saying that television does a poorer job of transmitting gloom than physical presence. A combination of physical presence and the public broadcast of this presence affect a nation's mood more than failure in a distant land. The final insight is that the colonial hangover has lasted²⁸, well over half-a-century after India became independent.

Whether defeat when anticipated matters as much as when less anticipated, is difficult to resolve. Matches in India with a higher probability of victory and those with the 'colonizers' with a lower probability of victory have similar impacts.

Cricket in India has also been characterized by significant illegal betting. The late nineties were marred by allegations of match fixing, and several players (including some from India) were suspended from playing the game. Data on the illegal betting is well nigh impossible to obtain. I am assuming that gamblers are not necessarily patriotic and would not place bets on India alone. Therefore, explanations based on systematic personal wealth losses when India loses an ODI match, are not invoked.

Yuan et al. focus on the difference in returns between new and full moon (and across phases using a sinusoidal function). It is not possible to interpret their result as confirmation that only a good mood matters, or that only a bad mood matters. Hirshleifer and Shumway can again be similarly interpreted. Thus the ODI results add a second piece to the puzzle for future research. Positive and negative moods are not paired opposites in the context of asset-pricing, but act differentially.

²⁸ The winner of 2001 Nobel Prize for Literature, VS Naipaul, publicly rebuked an Indian author for continuing to harp on colonialism. This is to let Nayanatara Sehgal know that evidence is on her side.

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Table 1**Impact of ODI Results on the Stock Market:
All 237 Matches Played by India 1990-2001**

Panel A: Frequency of positive and negative returns of the market index				
Item	Total	Returns >=0%	Returns <0%	Chi-square Statistic
WON by India	118	61	57	0.003
LOST by India	119	48	71	5.896* [1]
Non-match days	2464	1268	1196	
Panel B: Means and standard deviations of the market index				
		Mean	Standard Deviation	t-statistic [2]
WON by India	118	0.032%	1.816%	-0.26
LOST by India	119	-0.450%	1.895%	-2.95*
Non-match days	2464	0.078%	2.019%	
[1] Chi-square statistic [d.f.=1] for LOST by INDIA $(1268/2464)*119=61.24$ $(1196/2464)*119=57.76$ $(48-61.24)^2/61.24 + (71-57.76)^2/57.76=5.896$ See Mendenhall and Reinmuth (1978)				
[2] t-statistic for LOST by INDIA Standard deviation is $(\sigma_{LOST}^2/118 + \sigma_{NON-MATCH}^2/2463)^{0.5}$ See Ariel (1990)				
* Significant at 5%				

Table 2
Impact of ODI Results on the Stock Market:
Matches Played Inside and Outside India

83 Matches Played Inside India				
Panel A1: Frequency of positive and negative returns of the market index				
Item	Total	Returns >=0%	Returns <0%	Chi-square Statistic
WON by India	55	27	28	0.124
LOST by India	28	8	20	5.873*
Non-match days	2464	1268	1196	
Panel B1: Means and standard deviations of the market index				
		Mean	Standard Deviation	t-statistic
WON by India	55	-0.113%	1.637%	-0.85
LOST by India	28	-0.702%	1.959%	-2.06*
Non-match days	2464	0.078%	2.019%	
154 Matches Played Outside India				
Panel A2: Frequency of positive and negative returns of the market index				
Item	Total	Returns >=0%	Returns <0%	Chi-square Statistic
WON by India	63	34	29	0.159
LOST by India	91	40	51	2.052
Non-match days	2464	1268	1196	
Panel B2: Means and standard deviations of the market index				
		Mean	Standard Deviation	t-statistic
WON by India	63	0.160%	1.962%	0.32
LOST by India	91	-0.372%	1.879%	-2.23*
* Significant at 5%				

Table 3

**Impact of ODI Results on the Stock Market:
Matches Played with the 'Colonizers' and the 'Colonized'**

95 Matches Played with the 'Colonizers'				
Panel A1: Frequency of positive and negative returns of the market index				
Item	Total	Returns >=0%	Returns <0%	Chi-square Statistic
WON by India	38	20	18	0.021
LOST by India	57	17	40	10.683*
Non-match days	2464	1268	1196	
Panel B1: Means and standard deviations of the market index				
		Mean	Standard Deviation	t-statistic
WON by India	38	-0.017%	1.811%	-0.32
LOST by India	57	-0.614%	1.718%	-2.97*
Non-match days	2464	0.078%	2.019%	
139 Matches Played with the 'Colonized'				
Panel A: Frequency of positive and negative returns of the market index				
Item	Total	Returns >=0%	Returns <0%	Chi-square Statistic
WON by India	79	40	39	0.022
LOST by India	60	31	29	0.001
Non-match days	2464	1268	1196	
Panel B: Means and standard deviations of the market index				
		Mean	Standard Deviation	t-statistic
WON by India	79	0.045%	1.838%	-0.16
LOST by India	60	-0.263%	2.062%	-1.26
Non-match days	2464	0.078%	2.019%	
* Significant at 5%				

Table 4**Impact of Losing Matches on the Stock Market:
Day-of-the-week Effect - All Matches Played by India**

Panel A: Regression of index returns on lose dummy						
Constant	LOSE Dummy					
0.00076 (1.93)	-0.00526 (-2.80)*					
Panel B: Regression of index returns on lose dummy and day-of-the week dummies						
Constant	LOSE Dummy	Monday	Tuesday	Wednesday	Thursday	Friday
0.00020 (0.03)	-0.00535 (-2.79)*	0.00110 (0.15)	0.00040 (0.06)	0.00105 (0.15)	0.00014 (0.02)	0.00016 (0.02)
* t-statistic significant at 5%						