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2011

Online at <https://mpra.ub.uni-muenchen.de/34736/>  
MPRA Paper No. 34736, posted 15 Nov 2011 16:11 UTC

## **Which Matters the Most for the Trading Index? (Law and Order or Weather Conditions)**

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### **Abstract**

Stock Markets are the indicators of economic activity taking place in an economy. There are multiple factors that can affect the performance of a Stock market. Besides the economical factors, the human behavior, the mood, willingness to pay and consumption patterns of people also plays an important role and affect the performance of a stock market. It has been empirically proven that human behavior is enormously and strongly influenced by the various weather conditions and law and order situation of the territory. This study investigates the effect of various weather conditions and law and order situation of Karachi on Karachi Stock Exchange trading volume. The daily data which includes

various weather conditions, law and order situations of the city and the trading volume of Karachi Stock exchange for the period from January 1995 to December 2010 has been tested. The study found that there is a significant impact of law and order situation on Karachi Stock Exchange trading volume, and likewise, weather conditions also regulate the performance of Karachi Stock Exchange most often. Temperature is a very significant driving factor in impacting the trading volume of Karachi Stock Exchange whereas, Humidity and Sea Level Pressure also has a significant impact on KSE performance.

**Keywords:** Trading Volume, Weather Conditions, Law and Order Situations, Karachi Stock exchange.

## **1. Introduction**

Law and order situation and climate change are the important issues for not stock markets only but also for almost every type of business and because of the significance and importance of law and order and weather conditions in business world, both the weather and law and order conditions are studied hundreds of times with thousands of dependent variables. Weather as well as the law and order conditions not only affect the business conditions of an economy but they also influences the behavior of individuals in variety of ways i.e. some time it influences the general behavior and mostly it influences the specific behavior of people. The approach of studying Stock Market's movement with respect to the law & order and weather conditions is not new; the research studies have been carried out in the different parts of the world with respect to law and order situations and different weather variables for countries.

This paper examines the relation of law and order conditions at Karachi and various Weather conditions i.e. Temperature (T), Humidity (H), Wind Speed (V) & Sea Level Pressure (SLP) of Karachi City with the Karachi Stock Exchange trading volume. The noticeable heterogeneity in this study are the set of variables used, which are "Sea Level Pressure (SLP) and Wind Speed (V)" which were never studied against the Performance of any Stock exchange in any part of the world. Due to the pacific/ tropical location and atmosphere of the Karachi city, these variables have brought extension in relevance to the stock market world. While, the law and order situation is also pondered in this paper, since from the two decades the Karachi city has been observed as a city of street wars and colonization where the inhabitants of these multiple colonies are the invaders for each other and the culture of expeditions and war fare between and among these multiple colonies turned this city into a city of turmoil despite of its cosmopolitan nature.

## **2. Literature Review**

The effect of weather on stock exchange returns has been researched for a number of times which suggested that there is a significant impact of weather on an investor's mood. When the weather is good, it creates a positive feeling on an investor through having some favorable prospects of financial markets. On the other hand, bad weather also hurts the investors by creating a negative relationship with trading index at stocks markets (Saunders, 1993; Hirshleifer and Shumway, 2001; Chang and Liu, 2008; Dowling & Lucey, 2008).

Researchers have argued that there is a significant impact of psychological factors on investors in countries of transition than those in developed economies due to a lower level of development of financial markets. It was found out that the greatest influence on the formation of positive expectations in developing economies is of the subjective perception of a current situation. Therefore, mood and subjective stances which are affected significantly by the law and order and various weather conditions have a higher probability to drive the market players in developing economies as compared to the developed ones. This explains the fact that the impact of law and order and weather conditions on investors and traders might be higher in Ukraine and its neighboring countries than in European and

North American nations being researched so far. Empirically several evidences has proved that individual behavior as decision making of people is influenced by their mood, emotional state and psychology and these attributes are strongly influenced by both the weather and law and order conditions (Murray, Muro , Finn & Leszczyc, 2010). Due to the versatile effects of weather it was investigated that weather affects the stock returns for most of the countries (Hirshleifer & Shumway, 2001; Goetzmann & Zhu, 2002).

Temperature, Humidity, Cloud cover & Sunshine Duration has been investigated by Kang, Jiang, Lee and Yoon (2010), where the authors examined the effects of these variables on stock market returns and found that Hong Kong stock exchange is insensitive of weather, while, Shenzhen stock exchange index is significantly affected by the outlined weather conditions. Hirshleifer & Shumway (2001) examines the effect of morning sunlight, rain and snow on country's leading stock exchanges and found that morning sunlight is strongly correlated with daily stock returns, but other weather variables snow and rain are unrelated to daily returns. Similarly, Murray, Muro , Finn, & Leszczyc (2010) studied Sun Light as independent variable and found that it has significant effect on ones "willingness to pay".

More over the performance of KSE-100 index was also investigated by keeping its ties with law and order situation in many studies. Subhani and Osman (2011a) noticed and reported while investigating the share prices at KSE 100 index that it is the investor's perception which causes the inconsistency to trading where these perceptions can be influenced by the law and order situation severely.

The market player's account for all possible events (which may be either law & order or weather etc.), in their decision making and set prices accordingly. However, Hirshleifer and Shumway(2001) argues that investors are irrational and their decisions are affected by different subjective factors.

While, another study done in Central & Eastern Europe tests the relationship between stock market variables (indices returns, individual stocks returns, spreads and trading volumes) and weather conditions that the market players are more likely to buy stocks when weather is seemingly pleasant/good and sell stock when weather is seemingly unpleasant/bad (Zadorozhna, 2009).

Symeonidis, Daskalakis, and Markellos (2010) found that Seasonal Affective Disorders and cloudiness is negatively associated with stock market volatility. While, Loughran & Schultz (2003) studied the impact of weather variables on NASDAQ Stock and concluded that there is a strong effect of sun light on NASDAQ stocks, whereas, cloudiness does not affect NASDAQ.

Market anomalies in stock markets should be related to investors' trading strategies, which are based on their psychologies along with other factors. The fact that law and order conditions and some weather variables affect investor's performance and mood can also affect stock prices and stock market substantially (Dowling & Lucey, 2008).

Hirshleifer and Shumway (2001) investigated 26 stock exchanges and reported that sunshine has a very significant impact on daily stock returns, after controlling the other weather conditions such as snow and rain, which are unrelated to returns.

While providing evidences in favor of weather effect on stock exchange returns, there are some studies, which claim that there is no effect or it is almost negligible. Loughran and Schultz (2003) have formed some portfolios with 4949 firms' shares, which are located in 25 cities of U.S and traded in NASDAQ Stock Exchange and they investigated the weather effect on these portfolios with respect to the investors who live in the same area with firms CEO's, and they revealed that there is no cloudy day's effect on portfolios returns.

Similarly, Tufan & Hamarat (2004) investigated the affect of weather on Istanbul stock exchange. They study the variation in Istanbul stock exchange by comparing with the cloudy weather. It was concluded that there is no relationship between the changes in weather on the variation in stock exchange.

Precisely, most of the previous studies abide with the one conclusion that the performance at various stock exchanges are at times the result of investors' mood, feelings and idiosyncrasy, which is more or less the resultant of the civic conditions of the society and as well as the nature.

### 3. Research Methodology

#### 3.1. Method of Data Collection

To investigate and explore the impact of law and order situation and various weather conditions on the performance of KSE 100 index, the daily data for the period of 1995 – 2010 is used. The variables involved for measuring out lined impact are, Volume of KSE 100- trading index, Mean score of law & order conditions at Karachi city, and various weather conditions for Karachi which includes, Mean Wind Speed (Km/h), Mean Temperature (°C), Mean Humidity (%), Mean Sea Level Pressure (mb).

#### 3.2. Econometrical Models and Econometrical Test

For measuring which matters the most to the performance of the KSE 100-index from law and order situations and various weather conditions, the following regression model (MLR) is used to conclude the findings.

$$TV = \alpha + \beta_1(MT) + \beta_2(MSLP) + \beta_3(MH) + \beta_4(MWS) + \beta_5(MSLOC) + ET$$

Where,

TV= Trading Index

MT= Mean Temperature (°C)

MSLP= Mean Sea Level Pressure (mb)

MH= Mean Humidity (%)

MWS= Mean Wind Speed (Km/h)

MSLOC = Mean score of law & order conditions

### 4. Results and Findings

The primary focus of this study is to ponder and investigate in comparison the impact of law and order situation and various weather conditions on the trading volume of the KSE 100 index, and which of the outlined predictors matters the most for impacting index volume for the different outlined years. The findings revealed some interesting and peculiar results that the model comprised upon the predictors which include the intercept and both the independent variables i.e law and order situation and various weather conditions predicts significantly to KSE-100 trading volume, it is further found out that the law and order situation at Karachi city affects the trading index significantly for the period of 1995-1998 (Beta=-6.188 at t=-5.123 for 1995; Beta=-4.789 at t=-2.113 for 1996; Beta=-5.172 at t=-4.210 for 1997; Beta=-2.851 at t=-1.759 for 1998). While it also affects significantly to trading index for the period of 2007-2010 (Beta=-5.728 at t=-2.108 for 2007; Beta=-49.11 at t=-2.834 for 2008; Beta=-41.99 at t=-2.934 for 2009; Beta=-29.63 at t=-3.105 for 2010). In contrast, the various weather conditions i.e. temperature effects to trading index significantly for the years of 1995, 1997, 2001-2005, 2008-2010; sea level pressure effects to trading index significantly for 2001, 2003-2005, 2007-2010; Humidity affects significantly to KSE index for 1995-2006; and wind speed for the years of 1995-1996, 1998, 2008-2010

**Table 1:** Summary of Results

Years	Adj. R Square	F		Constant	Mean temperature (°C)	Mean sea level pressure (mb)	Mean humidity (%)	Mean wind speed (Km/h)	Mean score law & order
1995	0.819	60.662	<b>Beta</b>	-605.782	6.979	0.829	2.869	-3.722	-6.188
			<b>t</b>	-0.539	5.429	0.774	7.658	-2.503	-5.123
1996	0.099	3.996	<b>Beta</b>	2157.75	-1.306	-1.555	-1.166	4.678	-4.789

**Table 1:** Summary of Results - continued

1997	0.532	14.859	t	1.183	-0.651	-0.883	-2.974	2.002	-2.113
			Beta	-2108.55	5.661	2.306	1.939	0.575	-5.172
1998	0.337	7.299	t	-1.778	4.213	2.008	6.592	0.293	-4.210
			Beta	-1807.04	-1.495	2.201	-1.488	5.857	-2.851
1999	0.286	1.539	t	-0.701	-0.552	0.886	-3.254	1.651	-1.759
			Beta	965.269	1.464	-0.711	0.105	0.116	-1.923
2000	0.362	4.181	t	0.93	1.172	-0.714	2.427	0.126	-0.101
			Beta	-1968.08	3.452	2.319	-2.058	3.06	-1.018
2001	0.394	15.144	t	-0.595	1.008	0.723	-2.288	0.691	-0.001
			Beta	5181.75	-6.623	-4.651	-0.982	0.919	-1.231
2002	0.081	4.72	t	6.856	-7.808	-6.424	-6.047	1.168	-0.753
			Beta	6005.01	-12.663	-5.334	1.957	-2.98	-1.092
2003	0.466	37.123	t	1.138	-2.269	-1.049	1.512	-0.475	-0.809
			Beta	-28805.7	57.535	28.295	16.21	-4.661	-6.618
2004	0.364	24.046	t	-5.137	8.629	5.249	2.581	-0.988	-1.205
			Beta	15423.3	-12.205	-11.912	-5.094	0.657	-1.754
2005	0.088	5.171	t	7.346	-4.596	-5.941	-8.313	0.252	-0.609
			Beta	-32706.9	28.762	35.615	5.656	8.491	-4.761
2006	0.253	16.533	t	-3.413	2.879	3.852	2.708	0.704	-0.817
			Beta	-547.7	-11.123	6.698	-15.54	4.219	-1.346
2007	0.041	3.978	t	-0.058	-1.057	0.743	-7.068	0.439	-0.092
			Beta	16154.7	-5.974	-11.231	-0.019	-4.303	-5.728
2008	0.379	23.866	t	3.093	-1.066	-2.251	-0.015	-0.797	-2.108
			Beta	60326.2	-74.487	-52.797	-32.55	67.42	-49.11
2009	0.144	8.969	t	3.618	-4.575	-3.291	-8.077	3.581	-2.834
			Beta	-31670.1	56.228	32.305	6.282	-37.17	-41.99
2010	0.15	9.383	t	-3.015	4.895	3.217	2.743	-2.555	-2.934
			Beta	15890.7	-18.737	-11.921	-2.962	-17.55	-29.63
			t	4.231	-4.881	-3.295	-3.401	-3.486	-3.105

## 5. Conclusion and Discussion

The findings revealed that the law and order situation at Karachi city effects the trading index for most of time/years than the various weather conditions which includes the period of democracy of Nawaz Sharif and Benazir regimes for both the pre Musharaf and post Musharaf periods, as the law and order situation was worst during 1995 -1998 and then 2008- 2010. Interestingly during the Musharaf regime the law and order situation never affected the trading index/volume except of 2007. Subhani and Osman (2011b) also concluded the same findings where it was confirmed that the non democratic regimes, included Musharaf period witnessed the better law and order conditions across the country and more specifically in Karachi City. While Stock Market's movement with respect to various weather conditions which includes Temperature, sea level pressure, Humidity, and wind speed observed in this study revealed that these outlined various weather conditions also affects the KSE-100 trading index for most of the analyzed periods. Similar to this finding Kang, Jiang, and Yoon (2010) concluded that Shenzhen stock exchange index is significantly affected by the similar weather conditions.

## 6. Policy Implication

This paper is a thought for the policy makers to ponder upon managing the dynamic behavior of the inhabitants of Karachi city regulating the KSE. This will in turn help to maneuver and handle the uncertain mood of the society of Karachi and its impact on the business arena.

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