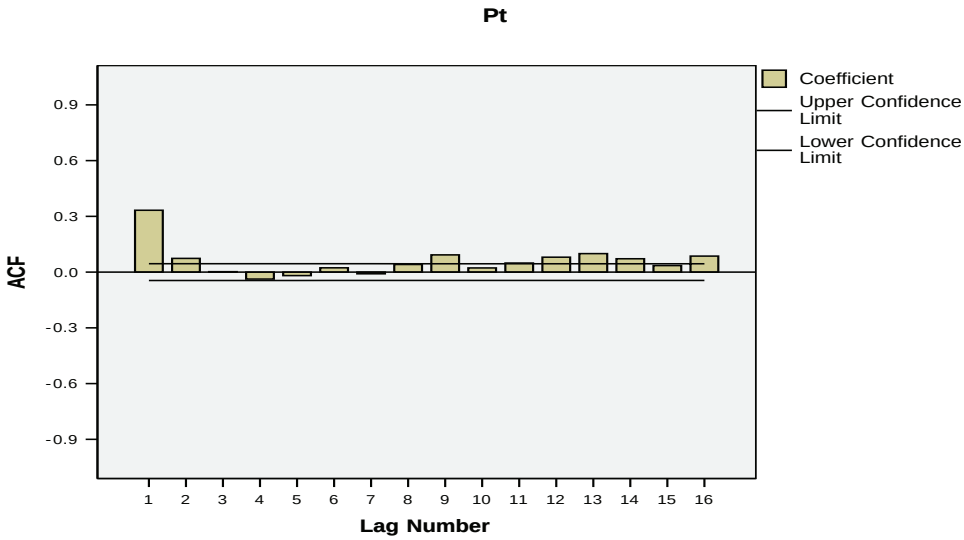
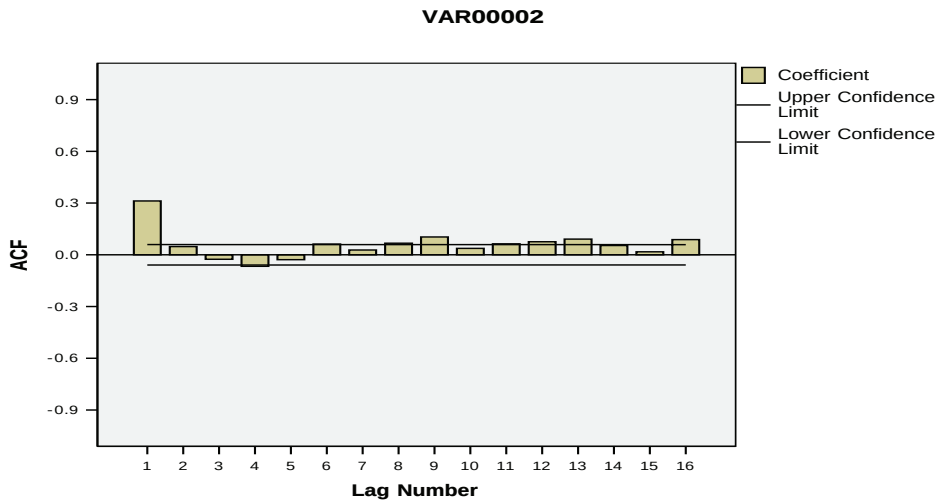


Auto-correlation coefficients at different lags (all Period)



Auto-correlation coefficients at different lags (Partial Period)

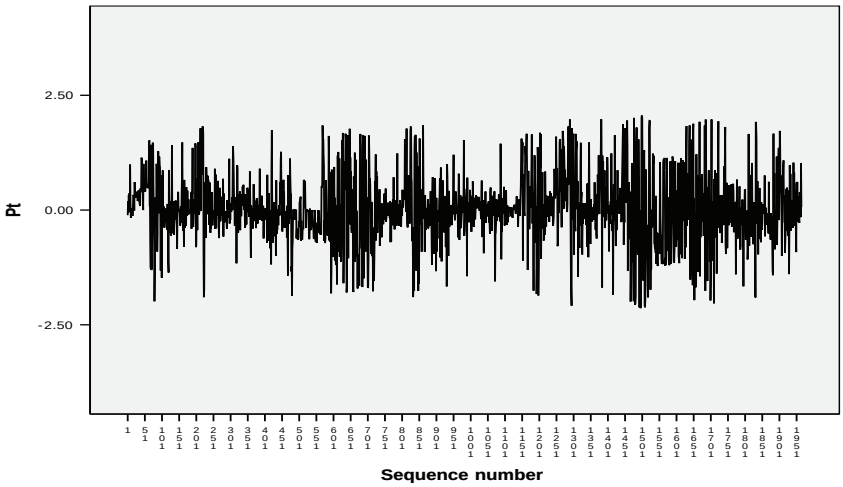


Figure (5): Index Daily Returns Chart (All Period).

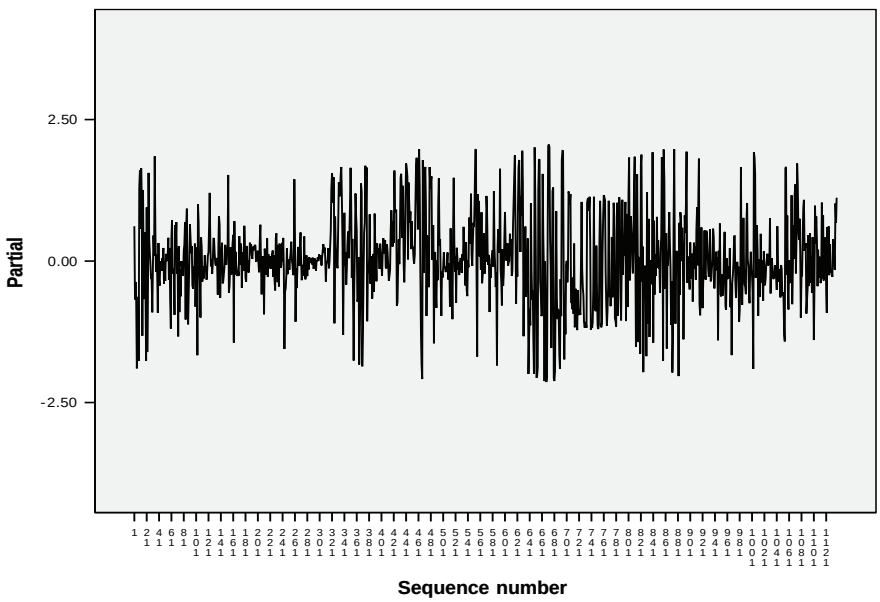


Figure (6): Index Daily Returns Chart (Partial Period).

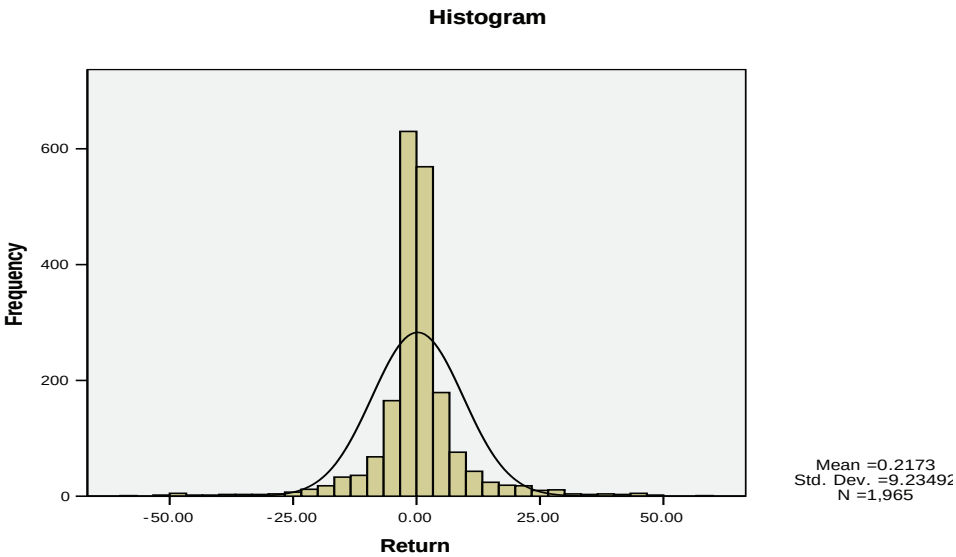


Figure (3): Index Daily Returns Histogram (All Period).

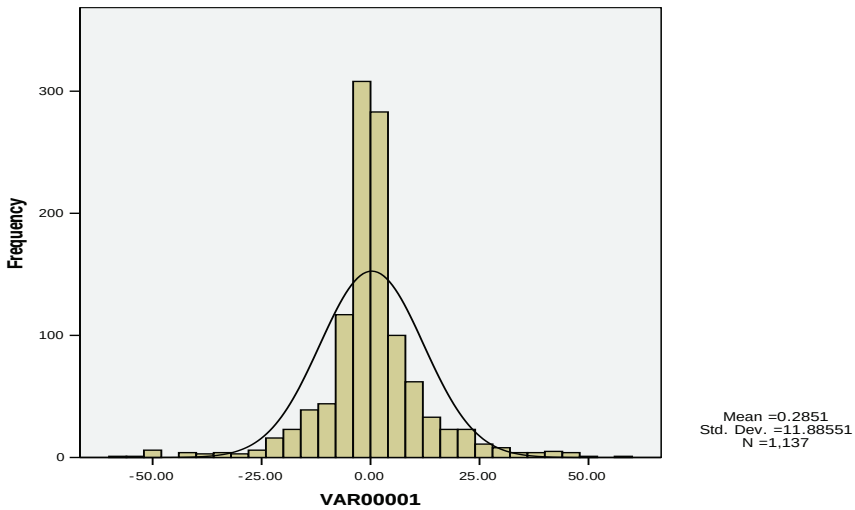


Figure (4): Market Profits Chart (Partial Period).

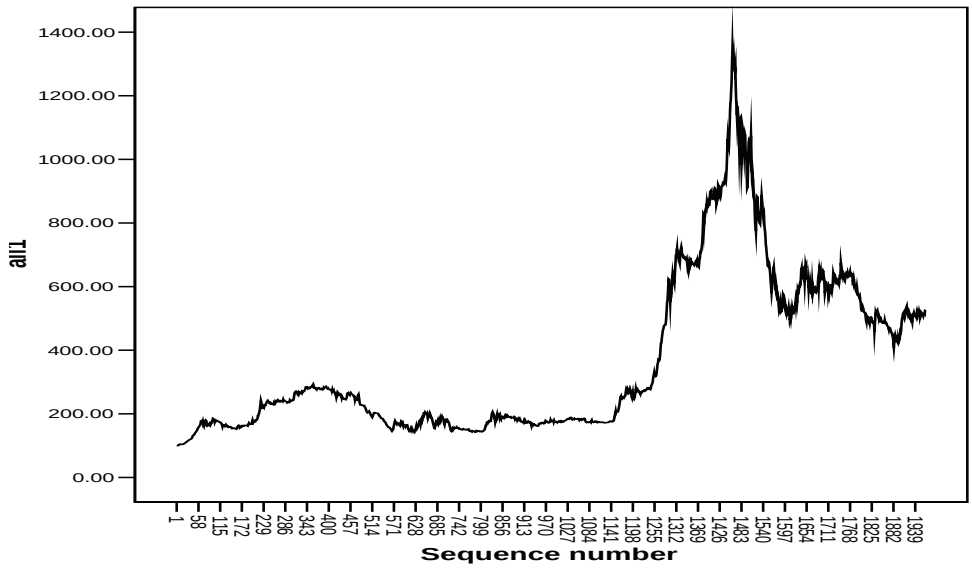


Figure (1): Index Daily Prices Chart (All the Period).

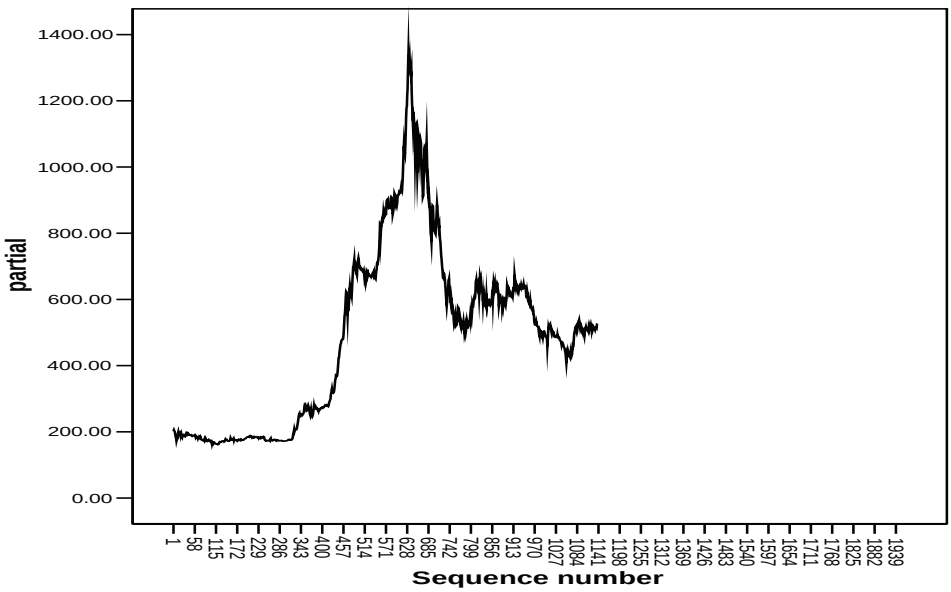


Figure (2): Index Daily Prices chart (Partial Period).

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6.3 Recommendations

The question is: what can be done to improve the efficiency of the PSE and to ensure its contribution to the development of the Palestinian economy? There are a series of policy actions that could improve the role of the PSE and improve its efficiency. However, these actions might not be as effective as hoped for as far as the political and economic instability continues to prevail in the Palestinian Territories.

Recommended actions can be classified under six related headings: (1) Improving disclosure and corporate governance requirements by the Capital Market Authority, by enforcing compliance of listed companies with these requirements. (2) Improving investment culture and overall analyzing process for traders and brokers, via education training and public awareness. (3) Increasing the market depth, by increasing the number of companies listed. (4) Capital Market Authority must accelerate the process of issuing by-laws and regulations that are necessary to organize and monitor the activities of the market as well as the financial intermediaries. (5) The efforts to incorporate the PSE should be completed, so that the PSE becomes a publicly held corporation that gains more confidence credibility. (6) The Palestinian Monetary Authority might consider amending the Banking Law to allow for more active role of banks in the trading activities in the PSA that will lend more depth and liquidity to the market.

6.2 Conclusions

The main conclusions can be summarized as follows:

- The PSE is found to be inefficient weak form market, since the random walk hypothesis was rejected. Expected returns may be predicted by technical analysis. These results agree with other previous studies on the market [Al-gareh (2001), Alfayoumi (2003), Abuzarour (2005)], and in other emerging markets.
- In particular, relevant information was not sufficient as companies did not comply with information quality requirements in their reports, besides there is the problem of reliability and timeliness of information. Investor's rely on the market rumors. This lag in information is being impounded into prices; (Al-Fayoumi 2003). There were restrictions on the repatriation of capital which may have deterred foreign participation, thus, contributing to illiquidity and low volume of trading. there were also no restrictions on insider trading which impact the market confidence and perceive risk less of the market.
- The Palestinian Capital Market Authority (PCMA) could take in to consideration, the disclosure matter, particularly the information availability, quality, especially timeliness, the company's obligation to keep up with, and the Corporate Governance issue, while regulating and controlling over the market as a private sector.
- The inefficiency of PSE follows from the violation of the necessary conditions for an efficient market. This leads to the conclusion that policies and regulations such as those concerning liberalization, deregulation and privatization have generated a perceived inconsistency, and a tendency to produce instability. The implication is that the benefits of a well functioning stock market are not being realized in the economy. Indeed, the weak-form inefficiency of the stock market demonstrated in this study is most likely caused by a combination of the lack of its development and the implication of policy choices. It is necessary to gain more insights into the operation and characteristics of the stock market of Palestine of its efficiency and the valuation processes to make an informed assessment of the empirical characteristics of the market.

information in the market. Second: Companies listed in PSE are subject to less investment research or the amount of information companies divulge is not disclosed properly and promptly. Thirdly: The market may be strongly influenced by poor investment culture and analysis process, thus trading is done on the basis of fad or just speculation (Poterba and Summers, 1988). Third, information is impounded first in large capitalized firms (PADICO and PALTEL) and then small capitalized firms, with a lag. This induces serial correlation in the index . Four: The scarcity of relevant and uncertain validity of corporate information, the existence of market rumors, lead to truncated fundamental analysis. Lastly: As traders in the market received information in a sequential of non random fashion, therefore stock prices and returns could be characterized by non random process also.

Despite the impressive growth of the PSE in recent years [See 2005 indicators in table (4-1)], it does not yet offer a real investment or finance option in the Palestinian economy. Evidently, only three companies (PADICO, PALTEL, BOP) take hold of more than 70% of the whole market trading capitalization, and about 10 companies of 36 listed in the PSE are involved in active trading.

The implication of these results for decision makers is that; the removal of restrictions and barriers to the flow of capital in this market is expected to improve and enhance growth and liquidity. Since a more liquid capital market offers lower borrowing costs for firms wishing to raise funds locally. Increasing the market liberalization will not only increase a locative efficiency within the Palestinian context, but will also provide locally and foreign investors with greater opportunities to diversify their portfolios and reduce risk. Although the Arab capital markets especially the Palestinian market, are sensitive to the country's political changes (Azzam 1997), Palestinian Financial Market has a unique case of uncertain political and economical conditions, which could be taken in consideration.

Where the null hypothesis is that VR (q) = 1 or that the chosen index follows a random walk. Returns are positively serially correlated for short time horizons and consistent with the findings of [Urrutia (1995), Lo and MacKinlay (1988)] When the random walk hypothesis is rejected and VR (q) >. For emerging markets, positive serial correlation in returns could simply describe market growth (Urrutia 1995).

When the random walk hypothesis is rejected and VR (q) < 1, returns are negatively serially correlated. This situation is often described as a mean-reverting process and consistent with the findings of (Fama and French 1988). This has been interpreted as an efficient correction mechanism in mature markets (Fama and French 1988) and as a sign of a "bubble" in emerging financial markets (Summers 1986).

6. Summary, Conclusions, and Recommendations

6.1 Summary

The random walk and weak-form efficient hypotheses were rejected for the general index at conventional levels of statistical significance, according to the auto-correlation and variance ratio test, even after correcting for infrequent trading. See Tables (5-3), (5-4).

Stock returns are also found to be mean-reverting which may signal frequent market corrections potentially due to high market volatility or over inflated prices from a bubble effect. This is alarming as it signals that investment in the market can be risky in the short run and result in substantial losses or substantial gains.

Nevertheless, as risk may decrease in the long-run in the market with mean-reverting returns (Giannetti 2005), investment in the PSE may only be beneficial over a longer time span. Several factors may explain why the PSE is weak-form inefficient. First: The movements of daily prices of quoted companies in PSE are restricted to a maximum of 5% below or above the opening prices. Accordingly, more than one day may be needed to capture the new information which creates dependencies, consist with (Al-Fayoumi 2003) results that there is a lag to response to

negative Z-values for market indicate positive serial correlation. Results show that the successive returns for the market is not independent at the 5% level (critical value -1.96), which consistent with the finding of (Abraham et al. 2002).When indices are corrected for infrequent trading, the results still the same.

Results of runs test for Palestine Securities Exchange market, observed vs. corrected index levels, Palestine. The runs test, tests for a statistically significant difference between the expected numbers of runs vs. the actual number of runs. A run is defined as a successive price changes with the same sign.

n (+) / n (-) / n (0) represent the number of successive sequence of positive/negative/zero price changes. Panel B shows the results for the index, corrected for infrequent trading.

Table (5-4): Runs Test Results

Panel A: Observed Index Returns	*All Period*	*Partial Period*
Observations (N)	1965	1137
n (+)	1087	586
n (-)	878	551
n (0)	0	0
Expected runs (m)	765	357
Actual runs (R)	639	294
Standard error (σm)	15.252	11.308
Z – Statistic	-7.288**	-5.233**
Panel B: Corrected Index Returns	*All Period*	*Partial Period*
Observations (N)	1965	725
n (+)	757	372
n (-)	795	353
n (0)	0	0
Expected runs (m)	775	356
Actual runs (R)	535	278
Standard error (σm)	15.313	13.456
Z – Statistic	-8.690**	-6.227**
Asymp. Sig. (2-tailed)	0.000	0.000

** Indicates rejection of the null hypotheses that successive price changes are independent at the 0.05 level.

$$Z(q) = \frac{VR(q) - 1}{\frac{2(2q-1)(q-1)}{3q(nq)}} \quad \ldots\ldots\ldots\ldots (4)$$

$$Z^*(q) = \frac{VR(q) - 1}{\left[\phi(q)^*\right]^{\frac{1}{2}}} \approx N(0,1) \quad \ldots\ldots\ldots\ldots (5)$$

As reported in tables (5-3), the null hypothesis of a random walk is rejected for all periods under homoscedasticity and heteroscedasticity. The results for the PSE are consistent with the results presented by (Urrutia 1995). However, because the reported values of the variance-ratio VR (q) are below 1, returns appears to be negative serial correlation in the series, consistent with mean-reversion and the likelihood of a "bubble".

In fact, when the random walk hypothesis is rejected in a particular market, the alternative hypothesis is that returns are serially correlated and this says nothing about efficiency. In this case, it is important to identify the type of correlation and complete further tests.

5.4 Runs Test:

In this section, we report results of weak form efficiency using the non-parametric runs test. This test is found to be preferable to its equivalent parametric test (serial correlation) under the circumstances here that returns data do not conform the normal distribution. The J-B and K-S tests statistic is reported in table (3-1). We examine in this section the independence of price changes using the runs test.

Results of the runs test are reported in table (5-4), both for observed indices and indices after corrected for infrequent trading.

In panel A for observed indices, the actual number of runs (R) in the market can be seen to fall short of the expected number of runs under the null hypothesis of stock return independence. The resulting

5.3 Variance Ratio Test:

The variance ratio test is used to test the RWH for the Palestine market, the variance is computed for multiples of 2, 5, 10, 20, and 40 days as holding periods with one-day return used as a base, results for the observed and the corrected indices are shown in panel A and B of table (5-3) respectively.

The variance ratios are defined as the ratio of (1/q) σq2 to σ1 2 for values of q = 2, 5, 10, 20, and 40, where σ2 is the variance of the index return defined as Ln (pt / pt – I).Panel B shows the results for the index, corrected for infrequent trading.

Table (5-3): Variance Ratio Test Results

Panel A: Log relatives of the observed index levels, Daily frequency

Days (q)	2	5	10	20	40
All Period					
VR (q)	0.8603	0.3518	0.2237	0.1711	0.0437
Z Value	-14.9060**	-11.4136**	-8.2944**	-5.5048**	-4.2221**
Z* Value	-9.6341**	-8.6787**	-6.0608**	-4.5694**	-4.0712**
Partial Period					
VR (q)	0.6572	0.2884	0.1672	0.0878	0.03421
Z Value	-12.8104**	-9.6326**	-8.4662**	-6.5714**	-4.4696**
Z* Value	-8.8234**	-8.2622**	-6.8246**	-4.9218**	-3.6248**

Panel B: Log relatives of the corrected index level

Days (q)	2	5	10	20	40
All Period					
VR (q)	0.7578	0.2854	0.1824	0.0862	0.0468
Z Value	-10.5068**	-8.3816**	-6.2042**	-4.5618**	-3.2884**
Z* Value	-7.6782**	-6.2760**	-4.2312**	-3.1835**	-2.4492**
Partial Period					
VR (q)	0.5652	0.2286	0.1282	0.0654	0.0389
Z Value	-9.1286**	-8.3028**	-5.4138**	-4.1048**	-2.4482**
Z* Value	-6.8734**	-6.2865**	-4.2620**	-3.2335**	-2.2404**

Asterisks, ** denote respectively statistical significance at the 0.05 level. Rejection of the RWH at 0.05 levels. The standard Z and Z* tests statistic as described in chapter three is:

is evident that there are significant (positive sign) auto-correlation coefficient at 1th, 2th, 3th, 6th, 7th, 8th, and 9th lag and significant (negative sign) auto-correlation coefficient at 4th, 5th, and 7th lag. The presence of non-zero auto-correlation coefficients in the log of the market returns series of the two samples clearly suggests that there is a serial dependence between the values.

To confirm the results, the autocorrelation co-efficient of the return series without outlier and for the two different periods are also calculated, results from Figures (2, 3) Confirm that there is a significant autocorrelation of daily market returns for the whole and partial samples period. The first order auto-correlation in all period is less than the partial sample period. On the other hand, second order autocorrelation and standard autocorrelation at higher lags is larger in the partial period sample than the all sample period.

The none zero auto-correlation of the series associated with Ljung -Box Q statistics, which are jointly significant at 5% level at 16 degrees of freedom (lags), suggest that return series does not follow random walk model. See figures (2.3.4.5).

Table (5-1): Autocorrelation Stand. All Period Samples.

Lags	1	2	3	4	5	6	7	8	9	10
*P*k	0.333	0.074	0.002	-0.038	-0.019	0.023	-0.009	0.042	0.092	0.022
Stand Err.	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.022	0.022

Total cases: 1965 observations

Table (5-2): Autocorrelation Stand. Partial Period Samples.

Lags	1	2	3	4	5	6	7	8	9	10
*P*k	0.312	0.048	-0.026	-0.067	-0.028	0.062	0.028	0.067	0.103	0.037
Stand Err.	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.029

Total cases: 1137 observations.

be obtained. Specifically, this model involves estimating the following equation:

$$R1 = a1 + a2\ Rt\text{-}1 + \varepsilon t \quad \ldots\ldots (1)$$

Using the residual from the regression, adjusted returns are estimated as follows:

$$R_t^{adj} = \frac{E_t}{(1-a_2)} \quad \ldots\ldots (2)$$

Where R_t^{adj} is the return at time t adjusted for thin trading?

Miller, Muthuswamy, and Whaley find that thin trading adjustment reduces the negative correlation among returns. The model above assumes that non-trading adjustment is constant over time. While this assumption may be correct for highly liquid markets, it is not the case for emerging markets. Therefore, equation (1) will be estimated recursively.

5. Empirical Findings

5.1 Results of Testing the Random Walk Hypothesis.

H01: The PSE is weak form efficient market.

In the first part, the auto-correlation test, and variance ratio test for the RWH of the Palestine market are carried out and comparisons are made between observed and corrected true index. A non-parametric runs test is explained and efficient markets hypothesis assessed in context of infrequent trading in part two.

5.2 The Auto-Correlation Test:

The auto-correlation coefficients have been computed for the log of the market return series shows significant auto-correlation at different lags for the whole period sample, and partial period sample. In Tables (5-1), (5-2), the results of auto-correlation analysis are presented. It

$$m = \frac{N(N+1) - \sum_{i=1}^{3} n^2 i}{N} \quad \text{.....(6)}$$

Where N is the total number of return observations and ni is a count of price change in each category. For a large number of observations (N>30), m approximately corresponds to a normal distribution with a standard error (σm) of runs as specified in equation (2).

$$\sigma_m = \left[\sum_{i=1}^{3} n_i^2 \left\{ \sum_{i=1}^{3} n_i^2 + N(N+1) \right\} - 2N \sum_{i=1}^{3} n_i^3 - N^3 \right]^{\frac{1}{2}} \quad \text{.....(7)}$$

The standard normal Z-statistic (Z = (R-m) / σm) can be used to test whether the actual number of runs is consistent with the independence hypothesis. When actual number of runs exceeds the expected runs, a positive (negative) Z value is obtained. Positive (negative) Z value indicates negative (positive) serial correlation in the return series.

A lower than expected number of runs indicates a market's overreaction to information, subsequently reversed, while a higher number of runs reflect a lagged response to information. Either situation would suggest an opportunity to make excess returns.

The runs test provides further evidence against weak- form market efficiency by indicating that the data is not consistent with a random series.

4.4 Estimating the True Index-correcting for Infrequent Trading

To correct the index we apply a correction to the observed index by using a methodology proposed by (Miller, Muthuswamy, and Whaley 1994) to separate the effect of infrequent trading. And to correct for infrequent trading, this methodology basically suggests that to remove the impact of thin trading a moving average model (MA) that reflects the number of no trading days should be estimated and then returns be adjusted accordingly. However, given the difficulties in identifying the non-trading days, Miller et al. have shown that it is equivalent to estimate an AR (1) model from which the non-trading adjustment can

First: we calculate the compounded daily returns on the index, find its variance and repeat the procedure for 2, 5, 10, 20, and 40 day returns. Second: calculate the variance ratios for all four times intervals, and test the hypothesis that it equals one, as the null hypothesis is that V R (q) = 1 means that the chosen index follows a random walk, when the random walk hypothesis is rejected and V R (q) > 1, in emerging markets, positive serial correlation in returns could simply indicate market growth (Urrutia 1995).

4.3 Non-parametric, Runs test

Runs test is used to examine statistical dependencies. The main advantage of this non-parametric test is that it ignores the distribution of the data [(Mobarek and Keasey, 2000), (Abraham, 2002)]. A run is defined as a succession of identical signs (+, - , 0) running through the data. If an abnormally high (or low) number of runs are present, then there is evidence against the null hypothesis of a random series.

This test determines whether successive price changes are independent. Unlike its parametric equivalent the serial correlation test, the runs test does not require returns to be normally distributed. A run is a sequence of successive price changes with the same sign. If the returns series exhibit grater tendency of change in one direction, the average run will be longer and the number of runs fewer than that generated by random process.

To assign equal weight to each change and to consider only the direction of consecutive changes, each change in returns was classified as positive (+), negative (-), or no change (0). The runs test can also be designed to count the direction of change from any base; for instance, a positive change could be one in which the return is grater than the sample mean, a negative change one in which the return is less than the mean, and zero change representing a change equal to the sample mean. The actual runs (R) are then counted and compared to the expected number of runs (m) under the assumption of independence as given in equation (1) below;

Where, P k is the Auto-correlation coefficients at lag k, n = sample size.

The presence of non-zero auto-correlation coefficients in the log of the market returns series clearly suggests that there is a serial dependence between the values. To confirm the results, the autocorrelation co-efficient of the return series without outlier and for the two different sample periods are also calculated.

4.2. Variance Ratio Test of Random Walk

Lo and MacKinlay (1988) suggested another method for testing the randomness of stock prices, the variance ratio test. We can apply the test to both, the stock price index and the individual stocks (Urrutia, 1995). The test is based on one of the properties of the random walk process, namely that the variance of the random walk increments must be a linear function of a time interval (q). This means that, for identically independently distributed (continuously compounded) returns ri,q, the variance must be q times the variance of ri,t, where ri,t, is defined as in (2.3) and

$$r_{i,q} = \log\left(\frac{P_{i,t}}{P_{i,t-q}}\right) \quad (3)\ldots\ldots$$

q = the time interval for which we compute a compounded return.

The variance ratio is calculated as:

(4.)…….

VR(q) = variance ratio

σ^2 (q) = (1/q) times the variance of q-day returns

σ^2 (1) = the variance of daily returns

Under the random walk null hypothesis, the expectation for this is equal to one. For testing this null hypothesis we use the test statistics as defined in Urrutia (1995):

(5)…… $z(q) = \frac{VR(q) - 1}{\sqrt{\phi(q)}}$

Where

$$\phi(q) = \frac{2(2q-1)(q-1)}{3q(nq)} \quad (6)\ldots\ldots$$

4. Methodology

In this study, the methodology proposed by (Miller, Muthuswamy, and Whaley 1994) was used to correct for infrequent trading. Separating the effects of infrequent trading allows us to draw a definitive conclusion regarding market efficiency and random walk. Such infrequent trading introduces bias into efficiency results. The main source of bias is that prices recorded at the end of a time period have a tendency to represent transactions that occurred earlier in, or prior to, the period in question. Thus, infrequent trading induces false autocorrelation in the series. Miller, in 1994 has shown that estimating AR (1) can solve the problem of infrequent trading. Specifically, the following relation can be employed:

$rt = \beta 0 + \beta 1\ rt\text{-}1 + \varepsilon t$ ……(1)

Using the residuals from the regression, adjusted returns are estimated as follows:

$rt\ adj = \varepsilon t /(1-\beta 1)$ ……..…….…….(2)

Where rt adj is the return at time t, adjusted for infrequent trading. Equations (1) and (2) assume that the non-trading adjustment required to correct returns are constant over time.

4.1. Auto-correlation Function Test

Auto-correlation test is usually the first reliable measure for testing either dependence or independence of random variables in a series. Kendall, 1948, compute the price changes at different lagged 1, 2, 3, 4, 5 time periods. Later the test is used to investigate dependency structure [(Balesco, and Santamaria, 1997), (Abraham, 2002)].

The serial correlation coefficient measures the relationship between the values of a random variable at time t and its value in the previous period. Auto correlation test is evidence whether the correlation coefficients are significantly different from zero. For a large sample, the Ljung-Box statistic follows the chi-square distribution with m degrees of freedom:

$LB = n\ (n+2)\ \sum m\ K=1\ (P2\ K / n –k)\ X2$

3.2 Palestine Securities Exchange Indicators:

Table (3-3) presents the main indicators of the PSE over the period 1998-2007.

Years / Indicators	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
M. Capitalization (millions $)	587.88	848.94	766.02	722.63	576.60	650.47	1096.52	4456.18	2728.811	2474.679
Listed Companies	18	20	22	23	24	24	26	28	35	35
Shares Traded (millions shares)	16.78	68.89	93.35	33.46	18.67	40.35	103.64	369.567	222.689	299.422
Trading Value (millions $)	68.64	150.24	188.98	74.53	45.08	58.33	200.56	2096.16	1067.37	813.47
Turnover (%)	0.94	1.74	1.70	0.94	0.60	0.76	1.66	6.44	5.74	4.87
Market Value (%GDP)	1.81	1.83	2.42	1.99	2.33	1.93	2.15	7.41	4.14	3.36
Value Traded (%GDP)	0.02	0.03	0.04	0.02	0.01	0.02	0. 02	0.07	0.05	0.04
Real GDP (Millions of US$)	4,534	4,712	4260.8	3988.5	3839.8	4325.5	4415.3	4750	4432.65	-
Al-Quds Index	154.98	236.76	207.62	195.00	151.16	.81	277.56	882.38	605	27.26
N0. of Trading Sessions	100	146	211	161	100	223	244	246	238	248

Sources: Arab Monetary Fund (AMF) bulletin, several issues, PSE Public Relation Department Publications, and Palestinian Central Bureau of Statistics.

3.1 Al-Quds Index:

The base date for the Al-Quds index is July 8, 1997 = 100. Al-Quds Index is calculated using a market-value weighted method. Al-Quds Index consists of 10 companies; these companies were chosen to represent all the sectors in the market, the most liquid in the marketS. Each year, this sample of companies is edited according to the statistics of that year. Table (3-2) below shows the company's symbols included in Al-Quds index:

Companies Included in Al-Quds Index.

#	**Company Symbol**	***Sector***
1	PALTEL	Service
2	PEC	Service
3	PRICO	Service
4	PADICO	Investment
5	AIG	Insurance
6	AIB	Banking
7	BOP	Banking
8	BPC	Industry
9	PIIC	Industry
10	JCC	Industry

Table (3-2): Source: PSE Public Relation Department Publications.

2.2 Study Hypotheses

This present study seeks evidence, whether the PSE market follows random walk hypothesis. The market is consistent with the weak form efficient hypothesis. To investigate empirically the Weak Form Efficiency of the PSE, the random weak hypothesis, we tested using the market returns time series data.

To facilitate our analysis, the following hypothesis was developed, and was stated in its null form as follows: ***H01: The PSE is Weak Form Efficient Market.***

3. Research Data and Description

The data consisted of daily index closing values for the PSE, Composite Index (Al-Quds). The first sample taken for the period: July 8th 1997 to December 30th 2007 totaled to (1966) observations, as the (All Period). The second sample taken for the period: April 30th 2003, to December 30th 2007 totaled to (1137) observations, as the (Partial Period), with frequent trading for three hours and five trading days per week. For more information about the PSE data see appendix (1). Figure (1-6).

Table (3-1): Market Returns Description, and Normality Tests.

Daily index returns are computed as Rt = 100 * ln (Pt / Pt-1)

Statistical	All Period	Partial Period
Mean	0.2173	0.2851
Median	0.0000	0. 0116
Maximum	2.0600	2. 0600
Minimum	-2.1400	- 2. 1400
Std. Dev.	9.2349	11.8550
Skewness	0.5500	-0.039
Kurtosis	9.6510	4.974
K-S	3.2990**	2.5460**
Jarque-Bera	1852.6700**	1376.4300**
Probability	0.0000	0.000
Observations	1965	1137

*: Normality Significance Level rejected is 5%.

2.1 Infrequent and Thin Trading

Emerging markets are typically characterized by low liquidity, thin trading, and possibly less well informed investors with access to unreliable information and considerable volatility. A number of studies have investigated the impact of thin trading and discussed its consequences. {(Miller, Mathuswamy and Whaley, 1994), (Lo and MacKinlay, 1995), (Blavy, 2002), (Moustafa, 2004), and (Abuzarour, 2005)].

Existents dependency is not necessarily evidence of predictability, but rather may be a statistical illusion brought about by thin trading. A number of different approaches have been suggested to correct for infrequent trading, (Stoll and Whaley, 1990) use the residual from an ARMA regression as a proxy of the true index, whereas; (Bassett, France, and Pliska, 1991) proposed the use of a Kalman filter to estimate the distribution of the true index. Jokivuolle, 1995 suggested a modified version of the Stoll and Whaley approach to estimate the true unobserved index from the history of the observed index. The correction consists of decomposing the log of the observed index in its random and stationary components.

In emerging markets, it is necessary to take into account thin trading which typically characterizes these markets when testing efficiency, since each stock trades at the end of each price change measurement interval, the observed stock price change will be equal to the true stock price change.

However, with non-synchronous trading, all securities in the portfolio are traded at least once during each interval but not necessarily at the end point. A number of studies have investigated the impact of infrequent trading, see, for example; [(Lo and Mackinlay, 1990), (Stoll and Whaley, 1990), and (Miller, Kmuthuswamy, and Whaley, 1994)].

In the context of Palestine, financial disclosure procedures are weak, and there is little public awareness about securities, poor investment culture, poor accounting and auditing procedures. All these factors have weakened the liquidity, volume of trading and limited the role of the PSE to mobilizing financial resources and direct them towards productive investment (El Jafary & Makhool.B 2004). But there are little studies that empirically investigated the investor's behavior recently. Because little is known about the stock price behavior in this market, the aim of the study is to investigate the effect of infrequent trading on market efficiency and the validity of the RWH.

In the literature of Palestine securities exchange, to the best of our knowledge, there are few literature studies that deal with this issue or particularly about the PSE. (Al-Gareh, 2001), in his MA dissertation, tested empirically the PSE daily price index in the periods (1997-2000), using multivariate methodology, and concluded that the market is rejecting the RWH on the weak form efficiency.

Al-Fayyoumi, 2003 tested the informational efficiency by testing the relationship between trading volume and stock-price volatility. His paper main results were that price volatility is not explained directly by the flow of information, so in the absence of volume as mixing variable, the GARCH model describes the market index returns quite well, upon introducing contemporaneous or lagged trading volume as proxy for information arrival, the volatility persistence does not vanish; Mixture of Distributions Hypothesis (MDH) is not relevant in the PSE, and he concluded that:

1. Price volatility is not explained directly by the flow of information.
2. Investors in the PSE should pay more attention to the fundamental (financial) information in order to improve the rationality of the decision making process.

Abuzarour, 2005 using the variance ratio test developed by Lo and Mackinlay in 1988 and the nonparametric runs test during the period from 1997 to 2004, examined the effect of non-trading on market efficiency for three emerging Arabian equity markets in the Middle East; Jordan, Egypt, and Palestine, which are typically characterized by low liquidity, thin trading, and possibly less well informed investors with access to unreliable information and considerable volatility, using the (Miller, Muthuswamy, and Whaley 1994) approach to estimate the true underlying index.

Results indicate that infrequent trading can affect the results of empirical studies on efficiency by introducing serious bias into the results of empirical work. In addition, inferences drawn from tests of market efficiency are rendered imprecise in the presence of infrequent trading. As the observed indices in thinly traded markets may not represent the true underlying index value, there is a systematic bias toward rejecting the efficient market hypothesis.

El-Erian and Kumar in the same year examined the RWH in emerging markets by choosing two countries from the Middle East region, namely Jordan, Turkey, and three other emerging markets from different regions. They found that there is serial dependence among the day to- day price changes in the stock market of Jordan and Turkey, indicating that the random model does not hold for these markets.

Urrutia in 1995 assessed the efficiency of the financial markets of Argentina, Brazil, Chile, and Mexico. Results reject the existence of a random walk when using a variance-ratio test and indicate that all four markets to be weak-form efficient when using a runs test, Urrutia further adds that the rejection of the random walk hypothesis suggests the presence of positive serial correlation in returns. Later Grieb and Reyes in 1999 revisited the Brazilian and Mexican markets using variance-ratio tests and found evidence of a random walk only for the Brazilian case.

Antonios, Ergul, and Holmes 1997 studied the Istanbul stock exchange and found it to be inefficient in the early times and its efficiency has improved as the country started liberalization and deregulations. In 1999 Ojah and Karemera found that the Latin American equity returns follow a random walk and are generally weak form efficient.

Omran and Farrar, 2001 tested the validity of the random walk hypothesis (RWH) in five Middle Eastern emerging markets; namely Jordan, Morocco, Egypt, Israel, and Turkey. Their results reject the RWH for all markets; instead they suggested that the stock returns in these markets exhibit calendar effects.

Abraham, 2002 tested the RWH for three Gulf equity markets; namely, Saudi Arabia, Kuwait, and Bahrain. After adjusting for infrequent trading, they found that both RWH and weak form efficiency are rejected for the Gulf markets when the observed index levels are used. In contrast, inferences are reversed with the use of the corrected true indices.

Al-Fayyoumi, 2003 and after adjusting the returns time series data of two periods; (1993-1996) and (1997-2000), found some evidence of efficient weak form of ASE in the second period results, attributing the different results to thin trading, prices non linear behavior, and new legislations. More recently, (Smith 2004) used a variance ratio methodology for Jordan and Lebanon and found support for the random walk hypothesis.

then its cost of capital is likely to be higher than that of a company with unrestricted access to the regional and international capital markets.

While conventional wisdom suggests that mature stock markets are generally weak form efficient (Fama, 1965 and 1970), conclusions for emerging markets are slightly more tentative. In these markets, a number of theoretical arguments support the rejection of the random-walk hypothesis because:

1. In thinly traded markets, the low level of competition and the subsequent dominance of some players may allow individual traders to set stock prices at levels significantly different from their intrinsic value.
2. The scarcity and uncertain validity of corporate information, the lack of auditing experience and the weaknesses of regulations and disclosure requirements lead to truncated fundamental information.
3. A number of structural and institutional specificities such as the fragmentation of capital markets and the presence of political and economical uncertainties may also account for departure from efficiency {(El-Erian and Kumar, 1995), and Blavy, 2002)}.

Standard empirical testing of the Weak Form Efficient Market hypotheses can be divided into two sub approaches: one is to determine the existence of predictability using past return series or price information, and the other, is to check whether technical trading rules can be exploited as a profit making strategy. Our study encompasses the first methodology.

Results from empirical investigation over different times are mixed: while some researchers can not reject the random-walk hypothesis for emerging markets {(Urrutia, 1995), and Smith, 2004)}; others find evidence of non-randomness of stock price behavior, {(Poshakwale, 1996), Lagoarde-Segot and Lucey, 2005)}.

However, evidence from emerging markets is not the same. Leading studies of market efficiency in the Middle East by Butler and Malikah in 1992 found that Saudi and Kuwaiti markets not to be weak-form efficient using serial correlation and runs tests. Using variance ratio test Al- Loughani, 1995 found further evidence of an inefficient Kuwaiti stock market.

1.2 Objectives of the Study

1. To empirically investigate the weak form efficient hypothesis in the (PSE) market.
2. To formulate policy recommendations that may enhance the efficiency and development of the PSE, especially with regard to the role of the Palestinian Capital Market Authority (PCMA), which was established recently in the year 2005 by the Palestinian authority (PA).

1.3 Importance of the Study

The study is considered important in the view of the following:

1. The efficiency of the security market is necessary for the harmonious growth of the capital market and particularly in an emerging economy. This paper looks at the case of the PSE, and uses the most widely accepted statistical tests based on stratified samples of stocks on daily data over a ten years period.
2. PSE has received less attention than other markets elsewhere. The evidence that does exist is incomplete in that it focuses on a small number of markets similar to this market. It draws upon low frequency and short sample data, and relies on a narrow range of empirical techniques.
3. Specific recommendations are needed to improve the efficiency of the market as a whole.

2. Literature Review and Hypothesis Development

The rising interest in investment opportunities in emerging economies has raised questions about the efficiency of financial markets. Why is it so important that they are efficient? When financial markets are (weak-form) efficient, the prices paid for stocks reflect past prices and the trading history of a security at each point in time and thus reflects the true value of stocks and result in the optimal allocation of private and social resources. This helps the investors to evaluate and decide their investment position and style.

In the context of the Arab region, questions of market efficiency are of concern both to Arab equity investors and companies in the region that make capital budgeting decisions. Specifically, if stock market is found to be not efficient and segmented and a firm is forced to raise capital locally,

Rejection of the weak form efficiency hypothesis (WFEMH) indicates that there exists potential for a profitable investment rule. While traditional knowledge suggests that mature stock markets are generally weak form efficient, (Fama, 1965 and 1970). There are Conclusions that emerging markets are slightly more tentative.

I**n the Palestinian Securities Exchange (PSE) Case**, it is usually believed that the market is not efficient in semi-strong or strong form. Many previous studies seek evidence of weak form efficient market hypothesis in least developed and shallow markets like the Palestine Securities Market. It is more logical to test the weak form efficiency of the market rather than semi-strong form and strong-form efficiency. The test of semi strong and strong form efficiency is very rare in emerging markets because of the absence of sufficient information in a convenient form of structural profile, inadequacy, regulation, weak supervision and administrative existing rules, poor quality and quantity of company's disclosure, and poor investment culture [El-Erian and Kumar, 1995), (Blavy, 2002)]. In the Palestinian case, many of these characteristics are found (El Jafary & Makhool, 2004).

1 .1 Problem of the study:

Palestinian economy is a unique case, due to limited resources and poor quality of small and medium family enterprises. So the need for an efficient capital market to attract and absorb foreign capitals, gather and protect the Palestinian savings is important.

The establishment of PSE has provided public shareholdings with new opportunities for financing at a time when the banking credit offered to the private sector in Palestine is low due to the banks conservative credit policies (Abdelkarim, 1995), (Sabri, 2003).

For financial markets to be meaningful and useful to the economy, they must be efficient. Here in the case of Palestine, there is evidence that the PSE is inefficient (Shaheen, 2006), (Alfayoumi, 2003), and (Abuzarour, 2005). Disclosure procedures are weak, and there is little public awareness about securities. These factors have weakened the liquidity, volume of trading and limited the role of the PSE to mobilize financial resources and reallocate them towards productive and competitive investments (El Jafary & Makhool, 2004).

1. Introduction:

Stock markets especially in emerging countries have an important role in the economy since they are able to allocate resources, both directly as a source of funds and as a determinant of firm's value and borrowing capacity. Public shareholding companies play a major role in the economy since they are able to calculate, absorb, and invest large amounts of long term capitals. The success of such companies is partly due to the desire of the public to invest in these companies. Therefore, sufficient information is needed to prior making Investments decisions.

Private capital flows into capital markets are very important also, as this would go a long way augmenting the limited domestic savings and developing market links with sources of the private capital. Efforts to attract such capital flows rely on important government initiatives for the development of the country. Information collected on private capital flows and stocks are important for economic and financial analysis, thereby assisting in the decision-making process by the government agencies, and institutions, individual investors, and other interested parties specifically, data collected on private capital flows and stocks. (Freedman and Stagliano, 2002).

Informational efficiency of financial markets which means the relationship between stock prices and information has attracted much interest among financial scholars and practitioners. At 1970 Fama has been the first to develop the Efficient Markets Hypothesis (EMH). Two decades later, he reviews the voluminous theoretical and empirical work undertaken by numerous researchers on the informational efficiency of stock markets. The basic assertion given by the EMH is that stock prices fully reflect any changes in the information set of investors.

A market following random walk is consistent with equity being appropriately priced at an equilibrium level, whereas the absence of a random walk infers distortions in the pricing of capital and risk. This has important implications for the allocation of capital within an economy and hence overall economic development.

Abstract:

This study aimed at empirically testing the efficiency of the Palestine Securities Exchange (PSE) in terms of the Composite Index (Al-Quds) for the period 8 July 1997 – 30 December 2007, i.e. (196s Observations). The random walk test is performed to ascertain whether the (PSE) is Weak Form Efficient. Three widely accepted statistical tests have been used, namely: Auto-Correlation Function (ACF), Variance Ratio (VR) based on (Lo and McKinley's 1988) Parametric tests, and Run tests as nonparametric tests.

Results showed that the PSE was inefficient for all and partial period samples, even after modification of date and analysis for the true underlying index using (Miller. Muthuswamy and Whaley 1994) approach. However, these results are consistent with evidence provided in {(Shaheen, 2006), (AbuZarrour, 2005), (Al-Fayoumi, 2003)}.

Thus, on the repatriation of capital, which may have deterred foreign participation, and contributed to illiquidity and low volume of trading, are due to the weakness confidence and perceived risks of the market. Therefore, the study presented a number of recommendations that may be helpful in improving the efficiency of the PSE, which in turn increases its role in the Palestinian economy as whole.

Keywords: Stock Markets and Economy, Efficient Market Hypothesis, Abnormal Returns.

ملخص

هدفت هذه الدراسة إلى اختبار تجريبي للكفاءة المعلوماتية في سوق فلسطين للأوراق المالية، من خلال استخدام بيانات مؤشر القدس اليومية للفترة من ٨ تموز ١٩٩٧– ٣٠ كانون الأول ٢٠٠٧ (١٩٦٦، مشاهدة). وقد استخدمت فرضية السير العشوائي لمعرفة ما إذا كان السوق كفؤاً على المستوى الضعيف، من خلال استخدام ثلاثة من الفحوصات الإحصائية المقبولة والمستخدمة على نطاق واسع لفحص كفاءة الأسواق المالية الناشئة وهي: فحص الارتباط الذاتي(ACF)، وفحص نسبة التباين (VR) باعتبارها فحصين معلميين، وفحص (Run Test) باعتباره فحصاً لا معلمياً.

وقد رفضت فرضية كفاءة السوق على المستوى الضعيف، وتبين من خلال النتائج أن السوق غير كفؤ على كل فترات عينة الدراسة، حتى بعد معالجة البيانات وتعديلها باستخدام منهجية (Miller، Muthuswamy and Whaley ١٩٩٤) وهو ما يتفق مع نتائج الدراسات الأخرى التي أجريت على هذا السوق. (Shaheen، ٢٠٠٦)، (AbuZarrour، ٢٠٠٥)، (Al–Fayoumi، ٢٠٠٣).

وبالتالي فإن القيود على عودة الأموال للسوق وتحويلها، حدت من مشاركة الاستثمارات الأجنبية، مما ساهم في وجود مشكلة السيولة، وانخفاض حجم التداول نظرا لضعف الثقة والمخاطر المتوقعة في السوق. ولذلك فإن الدراسة قدمت عددا من الاقتراحات التي قد تكون مفيدة في تحسين كفاءة السوق، بما يمكن ان يساهم في زيادة دوره وفعاليته في الاقتصاد الفلسطيني كله.

Empirical Testing of the Informational Efficiency in Palestine Securities Exchange (PSE).*

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