The Effect of Smoothening on Stock Market Response

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Abstract

This research aimed at investigating the effect of smoothening on stock market response. To accomplish this objective, the smoothening was testing with different parameters related to stock market index for both industrial and services sectors. Moreover, the relationship of smoothening relation was tested with total assets and size of the company. Different methods were applied to perform these tests.

Keywords: Smoothening, industrial sector, abnormal returns

1. Introduction

Smoothening is used by some companies to improve its image for investors. Some companies use smoothening as a tool to improve the position of its shares in public stock exchange markets. The practice of smoothening is found as a tool in different countries including Malaysia and Spanish. The purpose of this paper is to test smoothening in Amman Stock Exchange Market in the industrial sector.

2. Methodology

Two methods were applied to test the effect of smoothening on the cumulative abnormal returns. The first method was applied through the summation of the stock market index of each month for all companies running smoothening and the companies with no-smoothening (Companies Accumulative Method). The output database represents the monthly accumulative stock price of the companies with smoothening and without smoothening. The resulted database used to run linear regression analysis within the Statistical Package for Social Studies (SPSS). The predicted value of abnormal return calculated using the formulas resulted of linear regression for smoother and non-smoother companies. The difference between the real and the predicted values for the return of the company will represent the residual error (ε_{jt}) in function (1), which represents abnormal returns for smoothening and non-smoothening companies. The output of abnormal returns of smoothening and non-smoothening companies entered in one database to test for any statistical differences between smoothening and non-smoothening companies resulted of abnormal returns.

The second method of was applied to determine the accumulative abnormal returns depends on calculating the monthly return of the company for each company separately within the smoothening ones and for each company within the non-smoothening ones (Monthly Abnormal Returns). The difference between the real return of the company and the predicted one represented the abnormal return for each company. The effect of smoothening on the abnormal return was using Wilcoxon test (Z-statistic). The data was collected through Amman Stock Exchange Market for the period 2004-2010 for industrial sector. The following models have been used (Kamarudin et al., 2000; Iniguez and Poveda, 2004):

$$MVEjt = b0 + b1NIjt + b2SMOOTHERjt + ejt \dots\dots\dots\dots\dots\dots\dots \ (1)$$

Where:
　　MVEjt = Market value of shareholders' equity of firm j at year t
　　INCjt = Profit before tax of firm j at year t
　　SMOOTHERjt = 1=smoother, 0= Nonsmoother
　　bo = Intercept value
　　b1, b2 = Coefficient for variable 1, 2
　　e = Error

$$MVEj = b0 + b1SMOOTHERj + ej \dots\dots\dots\dots\dots\dots\dots\dots \ (2)$$

3. The effect of smoothening on the accumulative abnormal return

Accumulative abnormal return values for smoothening and non-smoothening companies using method 1 are shown in Table 1. For non-smoothening companies, the highest value of abnormal return 3.59 in the twelfth month of 2004 compared to 1.77 for the smoothening companies. In 2005, the highest value of non-smoothening companies was 1.28 compared to 1.86 for smoothening ones. N for the first method is twelve because the method relies on the accumulative abnormal return of all smoothening companies in a month or non-smoothening company in a moth. This means that mean of abnormal return indicates the mean of the accumulative abnormal return for all companies in a month. The accumulative monthly abnormal return for smoothening company was higher in 2004, 2008, and 2009. The only significant difference was in 2010 as the value of probability of Wilcoxon (Z-statistic) was 0.04. In 2010, abnormal return of smoothening company was 0.63 compared to -0.12 for non-smoothening companies with significant difference ($p<0.05$).

Insert Table (1) about here

For the industrial sector, analysis showed significant results between the smoother and non-smoother companies in the industrial sector except in 2000. In 2004, 2005, 2006, 2007, and 2008 the abnormal returns of smoother companies was higher than the non-smoother companies (Table 2).

Insert Table (2) about here

4. The relationship between smoothening and total assets and market value of equity
The relationship between smoothening and total assets

The results in Table (3) show relationship between the smoothening and the total assets for the large size companies in the industrial sector. The results show that there were significant difference between smoother and non-smoother companies regarding the total assets in 2006, 2007, 2008, 2009, and 2010 ($p<0.05$). In large companies in the industrial sector, the smoother companies has small total assets in 2004, 2005, 2006, 2007, 2008, 2009, and 2010 (Table 3). This may resulted of the trials of the small companies to follow the smoothening method to increase their competition in the stock market and increase the customer trust of these companies.

Insert Table (3) about here

In the small size companies of the industrial sector the results in Table 4 did not show any significant differences for the relationship between smoothening and the total assets ($p>0.05$). The total assets of the smoother companies is higher than non-smoother in 2004, 2005, 2006, 2007, and 2008, while in 2009 and 2010 it was lower. The results show that the smoothers find the smoothing as a good method to increase the customer trust despite their considerable total assets for their size.

Insert Table (4) about here

5. The relationship between smoothening and market value of equity

The relationship between smoothening and market value of equity was significant in 2000 ($p<0.028$) with higher value for the smoother companies in the large industrial sector (Table 5). In 2007, there was relationship between smoothening and market value of equity at $p = 0.055$, with higher market value of equity for the smoother companies (Table 5). The rest of year did not show any significant relationship with higher value of market value of equity for the non-smoother companies.

Insert Table (5) about here

In small size companies of the industrial sector, there was not any significant relationship between smoothening and market value of equity ($p>0.05$). The market value of equity does not have consistent trend in different years.

Insert Table (6) about here

6. The relationship between smoothening and the firm value

Table 7 shows the firms' value of the smoother and non-smoother firms in the industrial sector. The results show that in 2004 through 2010, the firm's value of the non-smoother companies is higher than that of the smoother company. The profit before taxes was lower for the smoother companies for all year except in 2003. This may be the cause that the smoother follow smoothening to increase their competitiveness and market value. Despite the significance of some relationship ($p<0.05$) and high adjusted R^2 values for different years, but still the contribution of the smoothening factor as a dummy variable in models was not significant (Table 8).

The profitability before taxes was significant in 2003, 2006, 2007 and 2009.

Insert Table (7) about here
Insert Table (8) about here

7. The relationship of company size, activity, smoothening with the yearly cumulative abnormal return

Table 9 shows insignificant multiple regression models that related the accumulative abnormal return with the size, smoothening and activity as the values of F were low and insignificant ($p>0.05$) and low adjusted R^2 value. The results showed that there significant effect of firm size in 2004, 2001 and 2010 (Table 9), while there was not effect of smoothening on cumulative abnormal return. The sector (industrial or service) does not affect the accumulative abnormal return of the companies.

Insert Table (9) about here

8. Conclusions

This research aimed at investigating the effect of smoothening on stock market response. To accomplish this objective, the smoothening was testing with different parameters related to stock market index for both industrial and services sectors. Moreover, the relationship of smoothening relation was tested with total assets and size of the company. Different methods were applied to perform these tests. The purpose of smoothening is to increase the level of market return (Michelson, etal., 2000). The smoothening was testing with different parameters related to stock market index for both industrial and services sectors. Moreover, the relationship of smoothening relation was tested with total assets and size of the company. Different methods were applied to perform these tests.

The results of this research showed the positive effect of smoothening on increasing the abnormal return of the smoother companies (Table 1). Similar results were reported by Kamarudin et al. (2000), Haji Yusoff (2001). The smoothening may be followed by the smoother companies to increase its competitiveness in the stock market to improve the repetition of the company (Bao and Bao, 2004). The significance of cumulative monthly abnormal return for all smoother companies within one sector compared to non-smoother companies of the same sector gave less significant effect of smoothening on the abnormal returns in both the industrial and service sectors.

Abnormal return of the smoother is greater than the non-smoother companies using the monthly market index values for each company. These results indicate that smoother companies have significantly greater risk-adjusted returns than non-smoother companies.

9. References

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Table 1 Means of cumulative abnormal return of smoothing and non-smoothening, t-test and Wilcoxon test

	Classification	N	Mean	Std. Deviation	t-value	Probability	Wilcoxon Test (Z-statistic	Probability
2004	Non-smoother	12.00	0.14	3.55	-0.13	0.90	-0.40	0.69
	Smoother	12.00	0.28	1.17				
2005	Non-smoother	12.00	0.18	0.91	0.74	0.47	-0.29	0.77
	Smoother	12.00	-0.23	1.67				
2006	Non-smoother	12.00	0.26	1.42	1.49	0.15	-1.39	0.17
	Smoother	12.00	-0.46	0.88				
2007	Non-smoother	12.00	0.01	3.67	0.33	0.75	-0.06	0.95
	Smoother	12.00	-0.36	1.41				
2008	Non-smoother	12.00	-0.12	2.90	-0.08	0.94	-2.02	0.04
	Smoother	12.00	0.63	33.77				
2009	Non-smoother	12.00	0.02	8.53	-0.24	0.81	-0.81	0.42
	Smoother	12.00	0.65	3.15				
2010	Non-smoother	12.00	-0.84	2.83	-0.16	0.87	-0.17	0.86
	Smoother	12.00	-0.69	1.54				

Table 2 Means of monthly abnormal return of smoothing and non-smoothening, t-test and Wilcoxon test

	Classification	N	Mean	Std. Dev.	Std. Error Mean	t-test	Prob.	Wilcoxon Z-statistics	Prob.
2004	Smoother	192	0.000104	1.82	0.13	0.01	1	-1.80	0.07
	Non-smoother	384	-0.00081	2.13	0.11				
2005	Smoother	192	-0.00031	2.39	0.17	0	1	-2.24	0.02
	Non-smoother	384	-0.00096	2.11	0.11				
2006	Smoother	192	0.000729	2.96	0.21	0.01	0.99	-2.78	0.01
	Non-smoother	384	-0.00107	2.50	0.13				
2007	Smoother	192	0.000208	3.04	0.22	0.01	1	-4.80	0.00
	Non-smoother	384	-0.00102	2.00	0.10				
2008	Smoother	192	-1.9E-16	9.97	0.72	0	1	-7.43	0.00
	Non-smoother	384	-0.00096	2.13	0.11				
2009	Smoother	192	0.000885	4.26	0.31	0	1	-2.95	0.00
	Non-smoother	384	-7.8E-05	3.65	0.19				
2010	Smoother	192	0.000625	3.57	0.26	0	1	-3.81	0.00
	Non-smoother	384	0.000964	2.69	0.14				
2004-2010	Smoother	112	1.13E-06	3.14583	0.297253	0	1	4.998	0.025
	Non-smoother	224	-1.9E-07	2.411071	0.161096				

Table 3 The relationship between smoothening and the total assets in large size companies

	Classification	N	Mean	Std. Deviation	Std. Error Mean	t-test	Prob.
2004	Smoother	13	7559422	4556282	1263685	-1.471	0.150
	Non-smoother	25	11268989	8436394	1687279		
2005	Smoother	13	8083918	4415320	1224589	-1.377	0.177
	Non-smoother	25	11573192	8520946	1704189		
2006	Smoother	13	7282412	4051475	1123677	-2.180	0.036
	Non-smoother	25	12003039	9254150	1850830		
2007	Smoother	13	7143808	3885015	1077509	-2.460	0.019
	Non-smoother	25	12656283	9824827	1964965		
2008	Smoother	13	7225991	3799564	1053810	-2.227	0.032
	Non-smoother	25	13824749	10266676	2053335		
2009	Smoother	13	7478360	4229490	1173050	-2.411	0.021
	Non-smoother	25	15722251	11878082	2375616		
2010	Smoother	13	7476794	3627048	1005962	-2.376	0.023
	Non-smoother	25	16064838	12689334	2537867		

Table 4 The relationship between smoothening and the total assets in small size companies

	Classification	N	Mean	Std. Deviation	Std. Error Mean	t-test	Prob.
2004	Smoother	3	1.553E+08	215990195	124701997	0.796	0.449
	Non-smoother	7	8.356E+07	84976861.6	32118234.7		
2005	Smoother	3	1.386E+08	194144435	112089342	0.401	0.699
	Non-smoother	7	1.015E+08	107092822	40477282.1		
2006	Smoother	3	1.359E+08	184550618	106550349	0.391	0.706
	Non-smoother	7	1.018E+08	99709823.7	37686771		
2007	Smoother	3	1.293E+08	163843539	94595111.6	0.497	0.632
	Non-smoother	7	9.309E+07	76799299.4	29027406.7		
2008	Smoother	3	1.324E+08	159322307	91984776.6	0.296	0.775
	Non-smoother	7	1.107E+08	80874639.5	30567740.5		
2009	Smoother	3	1.509E+08	148530879	85754343	-0.095	0.927
	Non-smoother	7	1.601E+08	138674305	52413960.6		
2010	Smoother	3	1.513E+08	147133451	84947537.3	-0.276	0.790
	Non-smoother	7	1.831E+08	173367837	65526883		

Table 5 The relationship between smoothening and the market value of equity among large size companies

	Classification	N	Mean	Std. Deviation	Std. Error Mean	t-test	Prob.
2004	Smoother	13	6.927E+05	727099.6	201661.2	-2.320	0.028
	Non-smoother	25	2.149E+06	2971591	594318.3		
2005	Smoother	13	2.190E+06	3602524	999160.5	-1.106	0.276
	Non-smoother	25	9.166E+06	22437549	4487510		
2006	Smoother	13	4.102E+06	5443811	1509841	-1.181	0.245
	Non-smoother	25	1.135E+07	21649450	4329890		
2007	Smoother	13	8.268E+06	12333515	3420702	-1.982	0.055
	Non-smoother	25	2.186E+07	29732551	5946510		
2008	Smoother	13	2.787E+07	63178059	17522441	-0.244	0.808
	Non-smoother	25	3.185E+07	37628409	7525682		
2009	Smoother	13	2.493E+07	48261308	13385279	-0.877	0.386
	Non-smoother	25	4.856E+07	90302530	18060506		
2010	Smoother	13	1.825E+07	39150041	10858268	-0.598	0.554
	Non-smoother	25	3.457E+07	93757351	18751470		

Table 6 The relationship between smoothening and the market value of equity among small size companies

	Classification	N	Mean	Std. Dev.	Std. Error Mean	t-test	Prob.
2004	Smoother	3	2.598E+05	128982.4	74468.01	-0.978	0.357
	Non-smoother	7	3.092E+06	4845692	1831500		
2005	Smoother	3	4.959E+06	7155925	4131475	1.118	0.296
	Non-smoother	7	1.542E+06	3012131	1138479		
2006	Smoother	3	1.545E+06	2309288	1333268	-0.366	0.724
	Non-smoother	7	3.073E+06	6860120	2592882		
2007	Smoother	3	8.247E+06	12220126	7055293	0.744	0.478
	Non-smoother	7	3.763E+06	7198373	2720729		
2008	Smoother	3	1.240E+07	7636742	4409075	0.323	0.755
	Non-smoother	7	8.596E+06	19252916	7276918		
2009	Smoother	3	1.895E+07	5745338	3317072	-0.094	0.927
	Non-smoother	7	2.115E+07	38905920	14705056		
2010	Smoother	3	2.926E+07	35623473	20567222	-0.465	0.654
	Non-smoother	7	9.913E+07	2.51E+08	94757086		

Table 7 Means of the value of the smoother and non-smoother firms

	Smoother		Non-smoother	
	Mean	Std. Deviation	Mean	Std. Deviation
Market value				
2004	6.116E+05	674993.5	2.355E+06	3396752
2005	2.709E+06	4296003	7.498E+06	20044254
2006	3.623E+06	5047954	9.541E+06	19597493
2007	8.264E+06	11899723	1.791E+07	27427003
2008	2.497E+07	56919365	2.676E+07	35543251
2009	2.381E+07	43284468	4.256E+07	82089937
2010	2.032E+07	37617687	4.869E+07	1.4E+08
Profit before taxes				
2004	-4.140E+06	17333400	1.192E+06	2368536
2005	7.281E+05	1127232	1.441E+06	2842199
2006	1.095E+06	2246067	1.743E+06	3999933
2007	1.059E+06	1885129	2.282E+06	6153931
2008	1.165E+06	1617508	3.370E+06	11162001
2009	2.110E+06	4072528	4.827E+06	14600137
2010	2.130E+06	4764825	4.483E+06	12647661

Table 8 The relationship between smoothening and market value and profit before taxes of firms

Year	Intercept	Prof	Smooth	F-statistics	Probability	Adjusted R^2
2004	2330963**	0.02	-1635146	2.133	0.130	0.87
	504215.0	0.041	896825.3			
2005	2897541	3.193**	-2513173	6.743	0.003	0.231
	2939799	0.907	4606340			
2006	3969964	3.195**	-3845796	21.656	0.0001	0.49
	2289731	0.501	3680617			
2007	10000000**	1.487*	-7823583	3.667	0.033	0.140
	4234109	0.642	6926028			
2008	20000000*	1.312	1098902	1.875	0.165	0.077
	7843523	0.679	10000000			
2009	30000000**	2.656**	-10000000	6.218	0.004	0.217
	10000000	0.782	20000000			
2010	40000000	2.391	-20000000	1.453	0.245	0.061
	20000000	1.589	40000000			

Table 9 The relationship of company size, activity, smoothening with the yearly cumulative abnormal return

Year	Intercept	Smooth	Sic	Size	F-statistics	Adjusted R^2
2004	-1.767	0.295	-0.573	10.727*	1.000	0.043
	8.006	5.462	5.528	6.194	0.398	
2005	-1.903	0.311	-0.610	11.522*	0.955	0.041
	8.800	6.004	6.076	6.808	0.419	
2006	-2.208	0.367	-0.710	13.391	0.919	0.04
	10.427	7.113	7.199	8.066	0.437	
2007	-1.543	0.256	-0.492	9.323	0.583	0.025
	9.113	6.217	6.292	7.050	0.628	
2008	-1.707	0.278	-0.523	10.22	0.314	0.014
	13.624	9.294	9.407	10.54	0.816	
2009	-2.497	0.409	-0.809	15.226	0.541	0.024
	15.453	10.542	10.670	11.955	0.656	
2010	-2.601	0.422	-0.862	15.998*	1.060	0.045
	11.596	7.910	8.006	8.970	0.372	