
Cross-section Study on Return of Stocks to Future-expectation Theorem

YIQIAO YIN

B.A. Mathematics 14' and M.S. Finance 16'

University of Rochester - Simon Business School

Fall of 2015

Abstract

This paper discusses an application of behavioral finance. To understand Efficient Market Hypothesis, we present a cross-section analysis in this paper with a multi-various regression model. This paper explains return of stock prices by the return of fundamental factors and also compares the coefficients of returns of current fundamentals and that of the fundamentals in previous years. Results show Total Equity is the only fundamental factors that show significance explaining return of stock prices. Furthermore, the result shows that the coefficients of current fundamentals are statistically more significant than the previous ones, which illustrates that market digests all current publicly available information and moves relatively to information at present instead of the past. Last, the paper lands on an introduction of Future-expectation Theorem.

1 Introduction

Event studies produce useful evidence on how stock prices respond to information. Returns of stock prices do not follow any scientific equations. This is where event studies can be very useful for to understand the emotional content behind returns of stock prices.

Efficient Market Hypothesis states that prices fully reflect available information in the current market. However, there is a developing literature that challenges this topic, arguing instead that stock prices adjust slowly to information. In real life, it is possible for anyone to open up an individual brokerage account and directly participate in the market whether the action is guided by any rationale or not. However, chances that these individuals can actually affect market will not be significant. On the other hand, for anyone with a purchasing power big enough to affect the market or even to manipulate a particular stock, he probably does enough research to persuade him that his action is led by rationale instead of his emotions. John Bogle, the founder of Vanguard, stated in his book “The Clash of the Cultures” that intelligent investors try to separate their emotions of hope, fear, and greed from their trust in reason, and then expect that wisdom will prevail

over the long term. Hope, fear, and greed go along with the volatile market of short-term expectations, while trust in reason goes with the real market of long-term intrinsic value. Hence, it is reasonable to assume market fully digests all publicly available information.

This paper presents a study to understand market efficient hypothesis. Following the definition of efficient market, the current prices should be correlated with current fundamental data available from the book with higher significances than with past fundamental data. However, to claim market takes time to digest current publicly available information, one needs to show that the current prices relate to current fundamental data in fewer significances than to past fundamental data. This paper shows a cross-section study on an expansion of three-factor model, which will be explained in the next section. Then we analyze the result of the cross-section analysis of the multi-various regression model. The results, as stated in the definition of Efficient Market Hypothesis, persuade us that the current prices of stocks can be described by current fundamental factors with higher significances than by past fundamental factors. This helps to illustrate that market digest publicly available information.

The last section of this paper states an important theorem: Future-expectation Theorem. Disregard the size of buying power for an investor, investor will look at whatever information that is persuasive enough for him to make an investment decision that he thinks to be sound. The information can be in the past, at present, or expectation from the future. The final argument this paper makes is that the current return of stock prices is determined by the future-expectation of the everything related to the investment decision, namely *Future-expectation Theorem*.

2 Multi-various Regression Model

Investors analyze the fundamental of a company by determining the intrinsic value. It is a subjective value determined by the experience of an investor on a security. Although there is no rule to calculate intrinsic value, discounted cash flow is a reasonable method to show how much a company truly worth. In this section,

we explain the rationale behind the selection of independent variables and we seek correlation between cross-section of stock returns and the fundamental indicators.

2.1 Background

Intrinsic value is the present value of a company when we discount the future cash flow. We calculate the present value by discounting the future cash flow with discounting factor, a number calculated from debt and equity ratio. This illustration describes that the major investment that a company will purchase in the future can be financed by debt or equity. It is reasonable to assume that debt and equity may be correlated with stock prices.

Secondly, investors also use revenues or net income as a major factor to make investment decisions. Although a series of revenues or net income may have more power to make arguments than a single revenue or net income at a particular time, the information from immediate earnings report will affect stock market one direction or another. It is also reasonable to assume that revenues or net income may affect stock prices.

From this aspect, we choose the following fundamental indicators as independent variables: Total Liabilities (TL), Total Shareholders' Equities (TE), Net Income-to-Revenue (NI/R).

2.2 Three-factor Hypothesis

The returns of stocks, assuming market prices rationally reflect all the available information, should correlated with returns of basic fundamental indicators. We therefore have the following three-factor hypothesis with β_i to be the coefficient and α to be the error term.

$$\text{Three-factor Hypothesis : } \frac{dP}{dt} = \beta_1 \frac{dTL}{dt} + \beta_2 \frac{dTE}{dt} + \beta_3 \frac{dNI/R}{dt} + \alpha$$

Under this hypothesis, we look at return of stock prices by looking at the return of three fundamental factors. Instead of claiming a causal effect, this is a mathematical description of the returns of stock prices.

2.3 Multi-various Regression Model

With the understanding of return of stock prices, we now want to explore if market digest current information as we expected. We are assuming that the three fundamental factors affect all the companies in the sample size in the same way. In this model, we selected thirty companies from Dow Jones Industrial Average (DJIA) to be our sample size. We collected data points annually ten years in the past. We created a cross-section model to understand how important the time difference is when the market digests the publicly available information. We are looking at the returns of these data so we omit the first row of each company (since there is no number before to calculate the return for the first row). Hence, our sample size includes the annual fundamental data of thirty companies ten years in the past.

We had each fundamental factors to pair up with the current price. Then we manipulated the fundamental factors one-year in the past and two-year in the past to each pair up with current prices. Hence, we have first derivative (the return in mathematical language) of Total Liabilities (TL), Total Shareholders' Equity (TE), and Net Income-to-Revenue (NI/R), and we also have each fundamental factor shifted once and twice in the past, namely TL_{t-1} , TL_{t-2} , TE_{t-1} , TE_{t-2} , $\frac{NI}{R}_{t-1}$, and $\frac{NI}{R}_{t-2}$.

$$\text{Nine-factor Hypothesis : } \frac{dP}{dt} = \beta_1 \frac{dTL}{dt} + \beta_2 \frac{dTL_{t-1}}{dt} + \beta_3 \frac{dTL_{t-2}}{dt} + \beta_4 \frac{dTE}{dt} + \beta_5 \frac{dTE_{t-1}}{dt} + \beta_6 \frac{dTE_{t-2}}{dt} + \beta_7 \frac{dNI/R}{dt} + \beta_8 \frac{dNI/R_{t-1}}{dt} + \beta_9 \frac{dNI/R_{t-2}}{dt} + \alpha$$

We have Total Liabilities (TL), Total Shareholders' Equity (TE), and Net Income-to-Revenue (NI/R) as three independent variables. After the inputs of (TL_{t-1}) , (TL_{t-2}) , (TE_{t-1}) , (TE_{t-2}) , $\frac{NI}{R}_{t-1}$, and $\frac{NI}{R}_{t-2}$, we are looking at how the fundamental factors at present and in the past (one-year and two-year in the past) affect the cross-section of return of stock prices. Instead of having an α for each of the thirty companies, we assume that each of the independent variables affect the returns of stock prices the same and we use indicator to separate these companies. An $indicator_i$ will be 1 for a particular company and will be 0 for the rest of the companies. We then created a cross-section model with dependent variable to be the returns of stock prices from a sample of thirty companies ten years in the past.

$$\text{Cross-section Model}_1 : \frac{dP}{dt} = \beta_1 \frac{dTL}{dt} + \beta_2 \frac{dTL_{t-1}}{dt} + \beta_3 \frac{dTL_{t-2}}{dt} + \beta_4 \frac{dTE}{dt} + \beta_5 \frac{dTE_{t-1}}{dt} + \beta_6 \frac{dTE_{t-2}}{dt} +$$

$$\beta_7 \frac{dNI/R}{dt} + \beta_8 \frac{dNI/R_{t-1}}{dt} + \beta_9 \frac{dNI/R_{t-2}}{dt} + I_i, i \in [1, 30] \text{ and } i \in Z.$$

We then shift the returns of the fundamental factors one more unit annually in the past to create TL_{t-3} , TE_{t-3} , and NI/R_{t-3} . We obtain the following model. Under this hypothesis, we assume the return of stock prices can be described by three fundamental factors and with each one of them shifted one-year, two-year, and three-year in the past.

$$\begin{aligned} \text{Twelve-factor Hypothesis : } \frac{dP}{dt} = & \beta_1 \frac{dTL}{dt} + \beta_2 \frac{dTL_{t-1}}{dt} + \beta_3 \frac{dTL_{t-2}}{dt} + \beta_4 \frac{dTL_{t-3}}{dt} + \beta_5 \frac{dTE}{dt} + \beta_6 \frac{dTE_{t-1}}{dt} + \\ & \beta_7 \frac{dTE_{t-2}}{dt} + \beta_8 \frac{dTE_{t-3}}{dt} + \beta_9 \frac{dNI/R}{dt} + \beta_{10} \frac{dNI/R_{t-1}}{dt} + \beta_{11} \frac{dNI/R_{t-2}}{dt} + \beta_{12} \frac{dNI/R_{t-3}}{dt} + \alpha. \end{aligned}$$

We manipulate the indicators and apply the same method to create a cross-section study. We then compare the results of the coefficients among the current fundamental factors and each one of them one-year, two-year, and three-year in the past.

$$\begin{aligned} \text{Cross-section Model}_2 : \frac{dP}{dt} = & \beta_1 \frac{dTL}{dt} + \beta_2 \frac{dTL_{t-1}}{dt} + \beta_3 \frac{dTL_{t-2}}{dt} + \beta_4 \frac{dTL_{t-3}}{dt} + \beta_5 \frac{dTE}{dt} + \beta_6 \frac{dTE_{t-1}}{dt} + \\ & \beta_7 \frac{dTE_{t-2}}{dt} + \beta_8 \frac{dTE_{t-3}}{dt} + \beta_9 \frac{dNI/R}{dt} + \beta_{10} \frac{dNI/R_{t-1}}{dt} + \beta_{11} \frac{dNI/R_{t-2}}{dt} + \beta_{12} \frac{dNI/R_{t-3}}{dt} + I_i, i \in [1, 30] \text{ and } i \in Z. \end{aligned}$$

2.4 Result

The results show that the variables at present bear coefficients with higher significances statistically. Total Shareholders' Equity (TE) has the biggest t value among all and it generates a P-value of 3.1% which is less than 5%, indicating that this fundamental is statistically significant. There are seven indicators (show P-value less than 5%) to be statistically significant to the cross-section return of stock prices.

Moreover, we observe from both data sheet that the t-value for each fundamental factor at present is unanimously larger than in the past. This shows that the return of fundamental factors at present explain the return of stock prices more than it could from the past. In other words, the return of fundamental factors at present does not contribute to explain the return of stock prices in the future, which means fundamental numbers from earnings report (10-Q and 10-K) do not help us to predict the return of stock prices in the future.

Overall from the model, we can only conclude that Total Equity may have some power explaining the returns of cross-section of stock prices. However, there are only so many factors used in this model that the results may lean on Total Equity because of calculation methods. The significance of the coefficient of Total Equity does not prove that Total Equity causes the changes of stock prices. This certainly does not show us that Total Equity can predict the future price actions. We cannot reach any further conclusions about other factors disregard whether they are at present or in the past. The t values of every other factors are insignificant so we fail to reject the null hypothesis for them.

This table presents collected data from the first data sheet in the Data Section, including one-year and two-year in the past.

Return of Price	t value	P value
TL	-0.81	0.417
TL_{t-1}	-0.40	0.691
TL_{t-2}	-0.50	0.615
TE	2.18	0.031
TE_{t-1}	0.66	0.508
TE_{t-2}	0.58	0.565
NI/TR	1.67	0.096
NI/TR_{t-1}	-0.76	0.449
NI/TR_{t-2}	-1.11	0.268

This table presents collected data from the second data sheet in the Data Section, including one-year, two-year, and three-year, in comparison of the first data sheet together. The first column list each fundamental indicator in the model with time shifted one unit, two units, and three units in the past. Table also presents coefficient and the t-value with it for each indicator.

Return of Price	$\underline{t, t-1, t-2}$		$\underline{t, t-1, t-2, t-3}$	
	Coefficient	t-value	Coefficient	t-value
TL	-0.0893	[-0.81]	-0.1247	[1.14]
TL_{t-1}	-0.0413	[-0.41]	0.0001	[0.00]
TL_{t-2}	-0.0528	[-0.50]	-0.0298	[-0.28]
TL_{t-3}			0.0699	[0.66]
TE	0.1156	[2.18]	0.1344	[2.56]
TE_{t-1}	0.0058	[0.66]	0.0108	[1.21]
TE_{t-2}	0.0047	[0.58]	0.0081	[0.93]
TE_{t-3}			0.0087	[1.02]
NI/TR	0.0320	[1.67]	0.0252	[1.32]
NI/TR_{t-1}	-0.0147	[-0.76]	-0.0191	[-0.97]
NI/TR_{t-2}	-0.0341	[-1.11]	-0.0328	[-1.01]
NI/TR_{t-3}			0.0090	[0.48]

The fact that the returns of fundamental factors show greater significances statistically for cross-section returns of stock prices helps to explain market digest current publicly available information. If market is inefficient and takes time to digest current publicly available information, then the coefficient of past fundamental factors ought to show greater significances than the present ones. We would have seen some significances in the fundamental factors on those that are shifted one unit, two units, or three units in the past, if the past behaviors can predict the future ones. However that is not the result of this model. The results show that Total Equity (TE) and Net Income-to-Total Revenue (NI/TR) at present time, t , are the two most important indicators in describing the cross-section average returns of stocks in Dow Jones Industrial Average. When we traced into the past, the significance fades away and does not contribute to describing the average returns in the cross-section. Hence, market digests publicly available information as the Efficient Market Hypothesis suggested.

3 Conclusion

This models tells us that the returns of Total Liabilities (TL), Total Shareholders' Equity (TE), and Net Income-to-Revenue (NI/R) help to explain cross-section of returns of stock prices. Instead of running regression for each of the thirty companies in Dow Jones Industrial Average with ten sample size, a cross-section analysis speaks with more power because of its large sample size.

3.1 Future-expectation Theorem

An investor will look at whatever information to make an investment decision. The thinking process may or may not be rational because human beings can get emotional. However, disregard the rationale behind the thinking process, an investor will go through some thoughts before making an investment decision. Thus, we assume that the return of current stock prices must be related to information 1) in the past, 2) at present, or 3) in the future. We have shown that not all fundamental indicators at present can describe cross-section average returns of stocks at great significances. We have also shown in the results in section 2 that the past fundamental indicators do not describe cross-section average returns as well as the present fundamental indicators do. This left us the information in the future, i.e. the future expectation of stock performance.

Future-expectation Theorem: the current return of the prices of a stock is determined by future-expectation of the stock performances.

We were looking at thirty companies in Dow Jones Industrial Average and we collected data ten years in the past. This is a data set with over 200 sample sizes and the result can be understood as normal distribution. Under the assumption, all the information taken into consideration can only be in the past, at present, or in the future. The results from the data showed that the returns of fundamental factors at present are generating coefficients more significant statistically than the returns of fundamental factors in the past. We can know that investors would not put too much faith in the historical data when making investment decisions. Besides Total Equity, every other coefficients of returns of fundamental factors at present showed

insignificance statistically. We test null hypothesis for each one of them except for the coefficient of Total Equity, and we fail to reject the null hypothesis. This is to say, the coefficients of majority of fundamental factors do not show significance statistically and they do not help us describe the current return of stock prices.

We reject that the past return of fundamental factors do not contribute to describe the current return of stock prices. We also reject that the current return of fundamental factors do not contribute to current return of stock prices. Then we are left with information from the future. However, no one knows the return of fundamental factors in the future, but investors can apply some ability to figure out an expectation of future performance on a stock. We cannot measure how rational an investor can be. The ability from an investor may come from another person (e.g. financial advisor), experiences from his past knowledge used to predict future, or emotions (hope and fear). In other words, the current return of the prices of a stock is determined by future-expectation of the stock performances.

3.2 Conclusion

The result of this paper is to present a behavioral way of understanding Efficient Market Hypothesis. Under modern financial sector, analysts and money managers love to use mathematical tools to identify buy/sell and many methods have been proved to not be able to describe price behaviors consistently. Yet there are still many investors relying on these tools provided by their so-called "financial advisors". If these methods, explained and worshiped by majority of financial advisors and analysts on Wall Street, work perfectly fine, then we should be able to see higher significances from the t-value. Moreover, we might even see higher significances for the coefficients of fundamental factors in the past, because a lot of analysts use fundamental factors to predict to the future and they claim past patterns can tell them future price actions. However, the results, unfortunate for these analysts, show us this is not the situation they expect.

The Future-expectation Theorem, named it by its definition, is another way of telling us that we cannot conclude anything from the past or present fundamental factors. We are left with the information

from the third (and last) time periods, the future. In other words, the return of current stock prices, under the assumption that the return of stock prices must be relative to information in at least one of the three time periods, should be relative to the future-expectation of the stock performances.

Rather to be a ground-breaking idea, this paper serves as a method to illustrate Benjamin Graham's words, "Whenever calculus is brought in, or higher algebra, you could take it as a warning signal that the operator was trying to substitute theory for experience, and usually also to give to speculation the deceptive guise of investment" and also Warren Buffett's words, "Intrinsic Value is the discounted value of the cash that can be taken out of a business during its remaining life", i.e. future expectation of cash flow from a business.

4 Data

This is the data sheet from STATA software package used to conduct the cross-section study. The first data sheet is the result for cross-section study of thirty companies ten years in the history with fundamental factors shifted one-year and two-year in the past. The second data sheet is the result for cross-section study of thirty companies ten years in the history with fundamental factors shifted three-year in the past.

Source	SS	df	MS	Number of obs =	238
Model	5.09235897	39	.130573307	F(39, 199) =	2.01
Residual	12.9057302	199	.064852915	Prob > F =	0.0010
				R-squared =	0.2829
				Adj R-squared =	0.1424
Total	17.9980891	238	.075622223	Root MSE =	.25466

PS	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
TL	-.0893217	.1098373	-0.81	0.417	-.3059161	.1272727
TL_t1	-.0413014	.1038012	-0.40	0.691	-.2459929	.16339
TL_t2	-.0528457	.1049854	-0.50	0.615	-.2598723	.1541809
TE	.1155674	.0531023	2.18	0.031	.010852	.2202828
TE_t1	.005841	.008808	0.66	0.508	-.011528	.0232101
TE_t2	.004688	.0081269	0.58	0.565	-.0113378	.0207138
Z	.0320052	.0191126	1.67	0.096	-.0056841	.0696944
NITR_t1	-.014657	.0193346	-0.76	0.449	-.052784	.02347
NITR_t2	-.0341323	.0307555	-1.11	0.268	-.0947809	.0265162
Indicator_1	.0710055	.1093243	0.65	0.517	-.1445773	.2865883
Indicator_2	.149043	.0904727	1.65	0.101	-.0293652	.3274511
Indicator_3	.0180016	.0909364	0.20	0.843	-.1612411	.1974043
Indicator_4	.18273	.0935189	1.95	0.052	-.0016851	.3671452
Indicator_5	.3415414	.1081004	3.16	0.002	.1283721	.5547108
Indicator_6	.1918498	.113945	1.68	0.094	-.0328447	.4165444
Indicator_7	.2381366	.091544	2.60	0.010	.0576158	.4186574
Indicator_8	.1664873	.0911484	1.83	0.069	-.0132533	.346228
Indicator_9	.1824606	.0908488	2.01	0.046	.0033107	.3616106
Indicator_10	.177495	.086965	2.04	0.043	.0060039	.3489862
Indicator_11	.1176619	.0925214	1.27	0.205	-.0647863	.30011
Indicator_12	.0752827	.0906685	0.83	0.407	-.1035115	.254077
Indicator_13	.0816444	.09391	0.87	0.386	-.103542	.2668308
Indicator_14	.1829689	.0905634	2.02	0.045	.0043819	.3615559
Indicator_15	.0500585	.0907233	0.55	0.582	-.1288439	.2289609
Indicator_16	.1086188	.0912927	1.19	0.236	-.0714064	.2886439
Indicator_17	.0581138	.0913269	0.64	0.525	-.1219789	.2382064
Indicator_18	.0459622	.0948943	0.48	0.629	-.1411653	.2330896
Indicator_19	.0528693	.091306	0.58	0.563	-.1271822	.2329209
Indicator_20	.1700427	.0853688	1.99	0.048	.0016992	.3383862
Indicator_21	.0678835	.0907137	0.75	0.455	-.111	.2467671
Indicator_22	.3143417	.1479126	2.13	0.035	.0226644	.6060189
Indicator_23	.0720181	.0941329	0.77	0.445	-.1136079	.257644
Indicator_24	.1435251	.0908669	1.58	0.116	-.0356606	.3227107
Indicator_25	.0809188	.0932804	0.87	0.387	-.1030261	.2648637
Indicator_26	.1132293	.1016769	1.11	0.267	-.0872731	.3137317
Indicator_27	.0725352	.099437	0.73	0.467	-.1235501	.2686206
Indicator_28	.0561043	.0967234	0.58	0.563	-.1346299	.2468386
Indicator_29	.1029167	.0974897	1.06	0.292	-.0893288	.2951621
Indicator_30	.1254342	.0954681	1.31	0.190	-.0628248	.3136932

Source	SS	df	MS	Number of obs =	237
Model	5.45576876	42	.129899256	F(42, 195) =	2.08
Residual	12.1877719	195	.062501394	Prob > F =	0.0005
				R-squared =	0.3092
				Adj R-squared =	0.1604
Total	17.6435406	237	.074445319	Root MSE =	.25

PS	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
TL	-.1246891	.1092745	-1.14	0.255	-.3402007	.0908225
TL_t1	.0001439	.1035	0.00	0.999	-.2039793	.2042671
TL_t2	-.029806	.1053628	-0.28	0.778	-.2376031	.177991
TL_t3	.0698928	.1063387	0.66	0.512	-.1398287	.2796143
TE	.1343596	.052447	2.56	0.011	.0309234	.2377957
TE_t1	.0108183	.0089423	1.21	0.228	-.0068177	.0284543
TE_t2	.0080891	.0086636	0.93	0.352	-.0089972	.0251754
TE_t3	.008664	.0084788	1.02	0.308	-.0080579	.025386
Z	.0252301	.0190968	1.32	0.188	-.0124327	.0628929
NITR_t1	-.0191235	.0197356	-0.97	0.334	-.0580462	.0197992
NITR_t2	-.0328067	.0323756	-1.01	0.312	-.0966581	.0310446
NITR_t3	.0090052	.0187614	0.48	0.632	-.0279961	.0460065
Indicator_1	.2061718	.1220973	1.69	0.093	-.034629	.4469725
Indicator_2	.1478514	.0889167	1.66	0.098	-.0275105	.3232132
Indicator_3	.0112288	.0898124	0.13	0.901	-.1658997	.1883572
Indicator_4	.1899985	.0920048	2.07	0.040	.0085462	.3714508
Indicator_5	.31388	.1096428	2.86	0.005	.0976421	.530118
Indicator_6	.1473793	.1248961	1.18	0.239	-.0989412	.3936999
Indicator_7	.2285662	.0906001	2.52	0.012	.0498843	.4072482
Indicator_8	.1631221	.0897466	1.82	0.071	-.0138765	.3401206
Indicator_9	.1779171	.089528	1.99	0.048	.0013496	.3544846
Indicator_10	.1674644	.0863767	1.94	0.054	-.002888	.3378169
Indicator_11	.105825	.0918624	1.15	0.251	-.0753464	.2869965
Indicator_12	.0737192	.0892351	0.83	0.410	-.1022707	.2497092
Indicator_13	.0716732	.0934713	0.77	0.444	-.1126712	.2560176
Indicator_14	.1784338	.0891491	2.00	0.047	.0026136	.354254
Indicator_15	.0429351	.0893613	0.48	0.631	-.1333035	.2191737
Indicator_16	.100135	.0901397	1.11	0.268	-.0776388	.2779088
Indicator_17	.0485938	.0904721	0.54	0.592	-.1298356	.2270232
Indicator_18	.0308843	.0939924	0.33	0.743	-.1544878	.2162564
Indicator_19	.0362456	.0906537	0.40	0.690	-.142542	.2150331
Indicator_20	.1630299	.0840856	1.94	0.054	-.0028041	.3288638
Indicator_21	.0615885	.0892938	0.69	0.491	-.1145171	.237694
Indicator_22	.4067661	.1769121	2.30	0.023	.0578593	.7556729
Indicator_23	.0613929	.093332	0.66	0.511	-.1226768	.2454626
Indicator_24	.1375213	.0896388	1.53	0.127	-.0392647	.3143073
Indicator_25	.0732773	.0920616	0.80	0.427	-.108287	.2548416
Indicator_26	.0925626	.1071621	0.86	0.389	-.1187829	.3039081
Indicator_27	.0717309	.1027801	0.70	0.486	-.1309724	.2744343
Indicator_28	.0426591	.0971137	0.44	0.661	-.1488689	.2341872
Indicator_29	.0738301	.1009509	0.73	0.465	-.1252656	.2729258
Indicator_30	.101947	.0984564	1.04	0.302	-.0922291	.2961232

5 Acknowledge

I want to thank Prof. Olga Itenberg on the advise of selecting standardized variables. I also want to thank Prof. Heikki Rantakari for the instruction of cross-section analysis. I am grateful for my colleague and fellow classmate Luciano Somoza for the support and assistance on this paper.

6 Reference

1. Fama, E., 1970. "Efficient capital market: a review of theory and empirical work". *Journal of Finance*, 25, 383-417.
2. Fama, E., and French, K., "Size and Book-to-market Factors in Earnings and Returns". *Journal of Finance*. Vol. L, No. 1.