Original Research Article

EFFECT OF CAPITAL ASSET PRICING MODEL TOWARD STOCK PRICES

ABSTRACT

Capital Asset Pricing Model (CAPM) is one of the balance models can be used to determine the magnitude of the relationship between risk and return obtained by investors so that it will help investors to avoid investment errors. This study aims to determine (1) capital asset pricing model, and company stock prices in the Nikkei 225 Index technology sector; (2) capital asset pricing model on the company's stock prices in the Nikkei 225 index technology sector. The technique of data collection is done through secondary data, namely data obtained from the study of documentation and literature. The method used is descriptive method with census approach method. The population and sample of this study were the technology sector companies of the Nikkei 225 Index in 2016-2018. There were 57 companies in 2016-2018. The data analysis technique used is panel data regression analysis with a ratio measurement scale. Based on the results of the research and the results of data processing, it is shown that (1) Capital Asset Pricing Model in the technology sector company Nikkei 225 Index shows fluctuating results each year and effective in determining efficient and inefficient stocks for investors to use in making investment decisions. The company's stock price in the technology sector The Nikkei 225 index shows an increase in average stock prices each year; (2) Capital Asset Pricing Model has a significant positive effect on Stock Prices.

Keywords: Capital Asset Pricing Model, Stock Price

I. INTRODUCTION

Investment decision is a decision regarding investment in the present to get results or profits in the future. The company's investment decisions are very important for the survival of the company because of investment decisions regarding the funds that will be used for investment, the type of investment to be made, return on investment, and investment risks that may arise. Investment decisions have long-term time dimensions, so the decisions taken must be considered well because they have long-term consequences as well. The third basic investment decision, the relationship between risk and return hope, is a relationship that is in the same direction and linear.

This means that the greater the risk of an asset, the greater return the expected on the asset and vice versa.

The method Capital Asset Pricing Model (CAPM) is one of the balance models that can be used to determine the magnitude of the relationship between risk and return obtained by investors so that it will help investors to avoid investment errors. Understanding CAPM according to Irham Fahmi (2015) CAPM describes the relationship between returns and beta. CAPM is a model that connects the level of return expectedof a risky asset with the risk of an asset at a balanced market condition (Tandelilin, 2010). CAPM calculation, namely the return expected by investors for invested shares will be influenced by the systematic risk inherent in the stock. The greater the systematic risk of a stock, the greater the chance of return that will be obtained. The main objective of implementing the CAPM is to determine the level of expected return in minimizing risky investments. CAPM can also help investors in calculating risks that cannot be diversified in a portfolio and comparing them with predictions of the rate of return.

For three years, from 2016 to 2018 the combined stock price of the Nikkei 225 Index has increased every year. This shows, an increase in the number of shares purchased in each sector. The stock price is the price formed in the market whose amount is influenced by the law of demand and supply (Samsul, 2015: 197). When stock prices increase, it means there is an increase in demand and supply. The increasing market demand for a stock, it shows that the stock has return a good so much in demand by investors.

Seeing this phenomenon, to prove the truth, an analysis tool is needed to prove it. In predicting an uncertain and changing stock price every second, the analytical framework and alternative considerations that underlie investment decisions by investors will be wider and the model will be very complex and not easy to use, therefore the Capital Asset Pricing Model has assumptions so that easy calculation to apply. But the assumptions of the Capital Asset Pricing Model such as there are no transaction costs, shares can be broken up into unlimited units, no personal income tax, etc. (Jogiyanto, 2017: 576) it seems implausible to see the existing realization . Therefore in this study it will be proven whether the calculation of the Capital Asset

Pricing Model can affect stock prices amid conditions in the Capital Asset Prcing Model that are not realistic (not describing the actual situation).

The problems that will be formulated in this study are how is the Capital Asset Pricing Model and Stock Price in the Technology Sector Companies Included in the Nikkei 225 Index Registered at the Japan Exchange Group for the 2016-2018 Period?

II. LITERATURE STUDY

Capital Asset Pricing Model (CAPM) was first introduced by Sharpe, Lintner, and Mossin in the mid-1960s. Estimating or estimating the size of returns securities is something that must be done by investors. Investors must know the relationship between the amount of return and the risks found in securities. The right estimation model is used, namely the Capital Asset Pricing Model (CAPM). CAPM aims to determine the level of expected return of risky investments. In addition, CAPM can help investors in calculating risks that cannot be diversified in a portfolio and comparing with the rate of return. According to Jogiyanto (2017: 576), the assumptions used in the CAPM model are:

1. All investors have the same time horizon, investors maximize wealth by maximizing utility in the same time period.
2. All investors make investment decisions based on considerations between the value return expected and the standard deviation of the return of the portfolio.
3. All investors have uniform expectations homogeneous of the input factors used for portfolio decisions. Input factors used are return the expected return,a variant of the return and covariance between return-return securities.
4. All investors can lend a number of funds or borrow a number of funds with an unlimited amount of risk-free interest rates.
5. Shortsales arepermitted. Individual investors can sell short of whatever they want.
6. All assets can be broken into smaller parts indefinitely. This means that even with the smallest value, investors can invest and make asset sales and purchase transactions at any time at the prevailing price.
7. All assets can be marketed in perfect liquid. All assets can be sold and bought on the market quickly (liquid) at the prevailing prices.

8. There are no transaction fees. Sale or purchase of assets is not subject to transaction costs.
9. There is no inflation.
10. There is no personal income tax. Because there is no personal tax, investors have the same choice to get dividends or capital gains.
11. Investors are price-takers. Individual investors cannot influence the price of an asset by buying or selling the asset.
12. Capital markets in equilibrium conditions.

Expected Return is the return expected by investors in the coming masses (Jogiyanto, 2017). Expected Return is measured by calculating return risk-free (Rf) plus the risk premium. Risk premium is a reduction between returns market (Rm) and returns risk free (Rf) then multiplied by beta risk.

$$E\ (Ri) = Rf + \beta i\ (Rm - Rf)$$

(Jogiyanto, 2017: 587))

Beta (β) Risk

According to Jogiyanto (2017: 463) beta is a measure of volatility (volatility) of return a securities or return portfolio (Ri) to return market (Rm). Volatility can be defined as fluctuations in return-return of a security or portfolio in a given period.

$$\beta i = \frac{[n.\Sigma\ (R\ .\ R_i) - (\Sigma R_m\ .\Sigma R_i)]}{[n\ .\ (\Sigma R_m^2)].\ [\Sigma R_m^2]}$$

Return Individual (Ri)

Return Individual / Actual Return is a return that occurs at t time which is the difference in current price (P_{it}) relative to the previous price (P_{it}-1). Jogiyanto (2017) believes that Actual Return is returns that have occurred. Actual return can be calculated based on historical data. Actual return is important because it is used as a measure of performance of the company.

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{-1}}$$

Return Market (Rm)

The market return rate is the rate of return based on the development of the stock price index. Measuring market returns in this study is to compare the increase / decrease between the current Nikkei 225 stock price (Nikkei225Index t) with the previous period's Nikkei 225 stock price index (Nikkei225Index $t-1$).

$$\mathrm{Rm} = \frac{\mathrm{IndexNikkei225t} - \mathrm{IndexNikkei225t} - 1}{\mathrm{IndexNikkei225t} - 1}$$

Risk Free Rate (Rf)

According to Jogiyanto (2017) the risk-free rate of return is the number or rate of return onassets financial that are not risky. This rate of return can be used as the basis for determining the return minimum, because the return on investment in the risk assets sector must be greater than return of the riska ssets. For returns risk-free investment are often seen in the interest rates of government deposits.

$$\mathrm{Rf} = \sum \frac{\mathrm{Rf}}{\mathrm{N}}$$ (Husnan, 2005: 176)

Stock Price

According to Jogiyanto (2015: 8) suggests that stock prices are stock prices that occur on the stock market at a certain time that will be determined by market participants and determined by the demand and supply of shares concerned in the capital market. Then according to Samsul (2015: 197) the stock price is the price formed in the market whose amount is influenced by the law of demand and supply.

Stock prices are divided into four types, namely nominal price, initial price, opening price, market price) and closing price The nominal price of the stock is the price stated on the issued share. The initial price of a stock is the price that applies to investors who buy shares at the time of the public offering. The stock opening price is the stock price that applies when the stock market opens that day. The stock market price is the stock price when traded on a stock exchange determined by demand and supply. The closing price is the stock market price that is currently in effect when the stock exchange closes for the day.

III. RESEARCH METHODOLOGY

Method used in this study is a descriptive, quantitative analysis research method with a census approach. And the type of data used in this study is secondary data, which is from technology sector companies incorporated in the Nikkei 225 Index registered at the Japan Exchange Group for the period of 2016-2018. The data analysis technique used in this study uses pooled data (panel data) so that regression using panel data is commonly called the panel data regression model using the help of software computer statistics eviews version 8.

Research Objects

Author conducted research on 57 technology sector companies incorporated in Nikkei 225 Index registered at the Japan Exchange Group. The object of research in this study is the Capital Asset Pricing Model and Stock Prices.

Measurement of Variables

In this study the authors used two variables with the title "Effect of Capital Asset Pricing Model on Stock Prices". The two variables consist of one independent variable (Capital Asset Pricing Model) and one dependent variable (Stock Price).

1. Independent variable, namely capital asset pricing model is measured by:

   $E(R_i) = R_f + \beta (R_m - R_f)$

   Rf = Japan of Bank Rate

   β = Regression beta

   Rm = Composite Stock Price of the Nikkei 225 Index

2. Dependent variable, namely the stock price is measured by:

   Closing Price

IV. RESULTS AND DISCUSSION

Based on the results of tests that have been conducted, several research results have been found. The results of this study indicate that the Capital Asset Pricing Model has a significant positive effect on Stock Prices.

The Effect of Capital Asset Pricing Model To Stock Prices

onBased on the specification tests that have been done, the model should use estimates with fixed effect models. From the statistical test t with eviews, $value_t$ of 3.278991 and then compared with value, t_{table} at 95% confidence level, with a degree of freedom (n-2) = 171-2 = 169, namely with t_{table} 1.97410 and the probability at 0.0014, then Ho is rejected and Ha is accepted because t_{count} (3.278991) $\geq$ t_{table} (1.97410) or sig. (0.0014) $\leq$ α (0.05). This means that capital asset pricing models have a significant effect on stock prices. So the hypothesis that reads "There is the influence of the capital asset pricing model on stock prices", has been tested (acceptable) the truth.

The coefficient of beta for thevariable capital asset pricing model is 485.4974, X can explain Y by 485.4974 or it can be interpreted that every increase of one unit X can result in an increase in Y of 485.4974%. In this case other factors are considered constant.value Coeficient of (485.4974) means that the positive sign (+) indicates that the capital asset pricing model has a positive effect on stock prices.

The results of the above research show that the capital asset pricing model has a significant effect on stock prices in the technology sector companies listed in the Nikkei 225 Index in 2016-2018. Analyzing Capital Asset Pricing Model is to compare between returns stockduring this period with the return expected/expected return risk and itstherein. According to (Jogiyanto, 2017) the expected return is a return that has not yet occurred but will occur in the future so that the return actual stockwill move closer to the expected return. The Capital Asset Pricing Model can be used as a consideration for investing in undervalued stocks (higher return actual than expected return). Actual stock returns are undervalued used as investment choices because the return actual stock turns out to be greater than return the expected, which means that the stock is a cheap stock of its fair price and one day is predicted to be more expensive at a reasonable price. Stocks inconditions undervalued and overvalued will form a share demand by investors that will determine the stock price.

From the results of testing the Capital Asset Pricing Model has a significant positive effect on stock prices so that if the final result of the Capital Asset Pricing Model takes the form of a expected return rising, then the stock price will rise. Stock prices rise because when the expected return increases, stock returns actual will approach the expected return so that returns stock rise. While returns stock have a calculation component in the form of stock prices, so if returns stock rise, stock prices rise.

This is supported by previous research conducted by Mohammad Abdel Mohsen Al-Afeef (2017), examine Capital Asset Pricing Model, Theory and Practice: Evidence from USA (2009-2016). The conclusion obtained is that CAPM can be applied to the US stock market (S&P500) and can be aaplied on efficiency markets and huge companies. Then Wildan Deny Saputra, Suhadak, and Devi Farah Azizah (2015), they examined the use of the method capital asset pricing model (CAPM) in determining efficient stocks, and Riska Yulianti, Topowijono, Devi Farah Azizah (2016), they examined the application of the method capital asset pricing model (CAPM) to determine groups of efficient stocks. The conclusion obtained is that the CAPM method is effective in determining efficient stocks. The same is true in line with the research conducted by Faisal Muhammad Akram (2017), examine the relationship between capital asset pricing model on stock prices. The conclusion obtained is shows the capital asset pricing model an has effect on stock prices.

But thus, it is different from the results of the research conducted by Muhammad Ibrahim Khan, Maria Gul, Noorul Mudassar Khan, Bilal Nawaz & Sanaullah (2012), they examined about Assessing and Testing the Capital Asset Pricing Model (CAPM): A Study Involving KSE-Pakistan with result Capital Asset Pricing Model, (CAPM), failed to give accurate results and CAPM is not an effective model to measure risk and required return, and investors, therefore may not depend or rely on it in their investment decisions. Then Camelia Colescu dan Elena-Ariadna Papuc (2015) they examined An Evaluation of CAPM's validity in the Romanian Stock Exchange with result Capital Asset Pricing Model (CAPM) did not hold for the Romanian setup. Capital Asset Pricing Model (CAPM) was not found to be an effective model for risk and required return's measurement.

V. CONCLUSION

Based on the results and discussion of the research on the Capital Asset Pricing Model of Stock Prices in Technology Sector Companies Included in the Nikkei 225 Index, the following conclusions that Capital Asset Pricing Model of Stock Prices shows that the Capital Asset Pricing Model has a significant positive effect on Stock Prices on Technology Sector Companies Included in the Nikkei 225 Index.

VI. REFERENCES

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Appendix:

ATTACHMENT

Capital Asset Pricing Model

NO	STOCK CODE	COMPANY NAME	E(Ri)		
			2015	2016	2017
1	4151	KYOWA HAKKO KIRIN CO., LTD.	0.09142	0.00231	0.16059
2	4502	TAKEDA PHARMACEUTICAL CO., LTD.	0.08129	0.00086	0.01309
3	4503	ASTELLAS PHARMA INC.	0.08844	-0.00072	0.13951
4	4506	SUMITOMO DAINIPPON PHARMA CO., LTD.	0.11733	-0.00025	0.21669
5	4507	SHIONOGI & CO., LTD.	0.09729	0.00227	0.08079
6	4519	CHUGAI PHARMACEUTICAL CO., LTD.	0.07432	0.00184	0.24321
7	4523	EISAI CO., LTD.	0.07153	0.00361	0.31847
8	4568	DAIICHI SANKYO CO., LTD.	0.12965	0.01852	-0.20315
9	4578	OTSUKA HOLDINGS CO., LTD.	0.05251	0.00025	0.16448
10	3105	NISSHINBO HOLDINGS INC.	0.07275	0.00580	0.19130
11	6479	MINEBEA MITSUMI INC.	0.17890	0.00863	0.19618
12	6501	HITACHI, LTD.	0.11317	0.00927	0.18451
13	6503	MITSUBISHI ELECTRIC CORP.	0.12090	0.22261	-0.15793
14	6504	FUJI ELECTRIC CO., LTD.	0.15324	0.00500	0.39775
15	6506	YASKAWA ELECTRIC CORP.	0.12929	0.00404	0.06023
16	6674	GS YUASA CORP.	0.04288	0.00288	-0.09349
17	6701	NEC CORP.	0.06429	0.00591	0.14337
18	6702	FUJITSU LTD.	0.10110	0.00904	0.10308
19	6703	OKI ELECTRIC IND. CO., LTD.	0.10865	0.00389	0.14853
20	6724	SEIKO EPSON CORP.	0.09864	0.00490	-0.00589
21	6752	PANASONIC CORP.	0.13670	0.00723	0.16214
22	6758	SONY CORP.	0.14999	0.00451	0.10483
23	6762	TDK CORP.	0.16769	0.00692	0.36242
24	6770	ALPS ALPINE CO., LTD.	0.10272	0.01042	0.31436
25	6773	PIONEER CORP.	0.06593	0.00723	0.15766
26	6841	YOKOGAWA ELECTRIC CORP.	0.05923	0.00718	0.27033
27	6857	ADVANTEST CORP.	0.13092	0.00561	0.38578

28	6902	DENSO CORP.	0.11214	0.00879	0.13658
29	6952	CASIO COMPUTER CO., LTD.	0.07461	0.00539	0.23159
30	6954	FANUC CORP.	0.11901	0.00386	0.28254
31	6971	KYOCERA CORP.	0.08592	0.00339	0.19621
32	6976	TAIYO YUDEN CO., LTD.	0.07397	0.00995	0.41836
33	7735	SCREEN HOLDINGS CO., LTD.	0.16697	0.00324	0.31489
34	7751	CANON INC.	0.06527	0.00338	0.12048
35	7752	RICOH CO., LTD.	0.04041	0.00189	-0.12099
36	8035	TOKYO ELECTRON LTD.	0.17497	0.00256	0.31466
37	7201	NISSAN MOTOR CO., LTD.	0.11365	0.00685	0.07104
38	7202	ISUZU MOTORS LTD.	0.16286	0.00423	0.19336
39	7203	TOYOTA MOTOR CORP.	0.08337	0.00649	0.16550
40	7205	HINO MOTORS, LTD.	0.14578	0.00526	0.04365
41	7211	MITSUBISHI MOTORS CORP.	0.11274	0.00916	0.00631
42	7261	MAZDA MOTOR CORP.	0.16459	0.01204	-0.04403
43	7267	HONDA MOTOR CO., LTD.	0.09556	0.00799	0.16674
44	7269	SUZUKI MOTOR CORP.	0.08145	0.00527	0.01628
45	7270	SUBARU CORP.	0.06965	0.00878	0.00497
46	7272	YAMAHA MOTOR CO., LTD.	0.13552	0.01141	-0.02261
47	4543	TERUMO CORP.	0.02581	0.00118	0.27079
48	4902	KONICA MINOLTA, INC.	0.08372	0.00857	0.30537
49	7731	NIKON CORP.	0.03555	0.00165	0.30218
50	7733	OLYMPUS CORP.	0.10826	0.00422	0.22741
51	7762	CITIZEN WATCH CO., LTD.	0.02827	0.00896	0.13777
52	9412	SKY PERFECT JSAT HOLDINGS INC.	0.04409	0.00044	0.10726
53	9432	NIPPON TELEGRAPH & TELEPHONE CORP.	0.06845	-0.00034	0.16997
54	9433	KDDI CORP.	0.06449	0.00052	0.12714
55	9437	NTT DOCOMO, INC.	0.11736	-0.00130	0.23144
56	9613	NTT DATA CORP.	0.03315	0.00344	0.24974
57	9984	SOFTBANK GROUP CORP.	0.12188	0.00217	0.18596

Stock Prices (Closing Price)

NO	STOCK CODE	COMPANY NAME	Stock Prices (Closing Price)		
			2016	2017	2018
1	4151	KYOWA HAKKO KIRIN CO., LTD.	1,714.46	1,915.52	2,195.18
2	4502	TAKEDA PHARMACEUTICAL CO., LTD.	4,898.85	5,729.58	4,792.74
3	4503	ASTELLAS PHARMA INC.	1,583.98	1,443.14	1,672.80
4	4506	SUMITOMO DAINIPPON PHARMA CO., LTD.	1,647.59	1,675.75	2,290.61
5	4507	SHIONOGI & CO., LTD.	5,326.24	5,899.56	6,217.11
6	4519	CHUGAI PHARMACEUTICAL CO., LTD.	3,549.47	4,418.68	6,173.29
7	4523	EISAI CO., LTD.	6,543.50	6,048.34	8,224.53
8	4568	DAIICHI SANKYO CO., LTD.	2,460.55	2,574.07	4,004.49
9	4578	OTSUKA HOLDINGS CO., LTD.	4,482.66	4,882.37	5,288.71
10	3105	NISSHINBO HOLDINGS INC.	1,080.84	1,216.68	1,278.64
11	6479	MINEBEA MITSUMI INC.	928.83	1,738.11	2,037.10
12	6501	HITACHI, LTD.	2,601.64	3,616.53	3,282.72
13	6503	MITSUBISHI ELECTRIC CORP.	1,294.60	1,696.62	1,571.26
14	6504	FUJI ELECTRIC CO., LTD.	2,318.96	3,323.53	3,431.82
15	6506	YASKAWA ELECTRIC CORP.	1,465.32	2,913.83	3,972.45
16	6674	GS YUASA CORP.	2,207.57	2,647.87	2,336.29
17	6701	NEC CORP.	2,781.55	2,896.89	3,161.17
18	6702	FUJITSU LTD.	4,892.17	7,721.65	5,866.63
19	6703	OKI ELECTRIC IND. CO., LTD.	1,463.93	1,583.45	1,415.69
20	6724	SEIKO EPSON CORP.	1,933.74	2,560.03	1,945.34
21	6752	PANASONIC CORP.	1,041.07	1,454.34	1,394.48
22	6758	SONY CORP.	3,023.27	4,174.67	5,693.85
23	6762	TDK CORP.	6,703.84	7,761.53	10,180.52
24	6770	ALPS ALPINE CO., LTD.	2,277.14	3,193.19	2,786.37
25	6773	PIONEER CORP.	240.19	217.86	137.55
26	6841	YOKOGAWA ELECTRIC CORP.	1,320.31	1,877.63	2,152.97
27	6857	ADVANTEST CORP.	1,300.24	2,076.92	2,365.08
28	6902	DENSO CORP.	4,393.11	5,348.33	5,612.31
29	6952	CASIO COMPUTER CO., LTD.	1,713.00	1,624.93	1,658.96
30	6954	FANUC CORP.	17,511.84	23,341.58	22,711.30
31	6971	KYOCERA CORP.	5,135.03	6,689.25	6,432.02
32	6976	TAIYO YUDEN CO., LTD.	1,123.86	1,634.48	2,289.23
33	7735	SCREEN HOLDINGS CO., LTD.	5,656.93	8,030.97	7,711.99
34	7751	CANON INC.	3,120.12	3,792.19	3,621.02

35	7752	RICOH CO., LTD.	987.99	1,004.87	1,092.64
36	8035	TOKYO ELECTRON LTD.	8,598.37	15,351.26	18,103.38
37	7201	NISSAN MOTOR CO., LTD.	1,047.32	1,095.63	1,060.99
38	7202	ISUZU MOTORS LTD.	1,256.44	1,534.97	1,607.10
39	7203	TOYOTA MOTOR CORP.	6,062.66	6,420.45	6,989.98
40	7205	HINO MOTORS, LTD.	1,141.88	1,336.19	1,237.73
41	7211	MITSUBISHI MOTORS CORP.	589.24	760.62	778.33
42	7261	MAZDA MOTOR CORP.	1,716.62	1,598.94	1,352.79
43	7267	HONDA MOTOR CO., LTD.	3,059.18	3,348.45	3,426.75
44	7269	SUZUKI MOTOR CORP.	3,281.00	5,286.95	6,111.30
45	7270	SUBARU CORP.	4,082.80	3,960.29	3,226.90
46	7272	YAMAHA MOTOR CO., LTD.	2,032.77	2,956.42	2,949.25
47	4543	TERUMO CORP.	4,128.69	4,408.78	6,128.50
48	4902	KONICA MINOLTA, INC.	942.34	989.39	1,032.52
49	7731	NIKON CORP.	1,605.22	1,870.76	1,923.01
50	7733	OLYMPUS CORP.	3,998.97	4,103.72	4,016.47
51	7762	CITIZEN WATCH CO., LTD.	610.11	769.04	721.93
52	9412	SKY PERFECT JSAT HOLDINGS INC.	547.73	499.29	509.27
53	9432	NIPPON TELEGRAPH & TELEPHONE CORP.	4,784.59	5,200.92	4,959.24
54	9433	KDDI CORP.	3,069.75	2,980.60	2,854.13
55	9437	NTT DOCOMO, INC.	2,640.91	2,666.66	2,779.77
56	9613	NTT DATA CORP.	1,092.09	1,187.88	1,280.22
57	9984	SOFTBANK GROUP CORP.	6,152.11	8,883.80	8,847.96

Result Eviews 8

COMMON EFFECT MODEL

Dependent Variable: Y
Method: Panel Least Squares
Date: 05/15/19 Time: 06:37
Sample: 2016 2018
Periods included: 3
Cross-sections included: 57
Total panel (balanced) observations: 171

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3160.447	349.4605	9.043790	0.0000
X	5174.587	2585.334	2.001516	0.0469

R-squared	0.023156	Mean dependent var	3614.021
Adjusted R-squared	0.017375	S.D. dependent var	3509.325
S.E. of regression	3478.703	Akaike info criterion	19.15833
Sum squared resid	2.05E+09	Schwarz criterion	19.19508
Log likelihood	-1636.038	Hannan-Quinn criter.	19.17324
F-statistic	4.006066	Durbin-Watson stat	0.736301
Prob(F-statistic)	0.046937		

FIXED EFFECT MODEL

Dependent Variable: Y
Method: Panel EGLS (Cross-section weights)
Date: 05/15/19 Time: 06:46
Sample: 2016 2018
Periods included: 3
Cross-sections included: 57
Total panel (balanced) observations: 171
Linear estimation after one-step weighting matrix
Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3571.465	17.76474	201.0424	0.0000
X	485.4974	148.0631	3.278991	0.0014

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.985049	Mean dependent var	9497.898
Adjusted R-squared	0.977508	S.D. dependent var	7256.528
S.E. of regression	979.4036	Sum squared resid	1.08E+08
F-statistic	130.6168	Durbin-Watson stat	2.710373
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.943759	Mean dependent var	3614.021
Sum squared resid	1.18E+08	Durbin-Watson stat	2.419030

UJI CHOW

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	33.123483	(56,113)	0.0000
Cross-section Chi-square	488.605497	56	0.0000

Cross-section fixed effects test equation:
Dependent Variable: Y
Method: Panel Least Squares
Date: 05/15/19 Time: 07:05
Sample: 2016 2018
Periods included: 3
Cross-sections included: 57
Total panel (balanced) observations: 171

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3160.447	349.4605	9.043790	0.0000
X	5174.587	2585.334	2.001516	0.0469

R-squared	0.023156	Mean dependent var	3614.021
Adjusted R-squared	0.017375	S.D. dependent var	3509.325
S.E. of regression	3478.703	Akaike info criterion	19.15833
Sum squared resid	2.05E+09	Schwarz criterion	19.19508
Log likelihood	-1636.038	Hannan-Quinn criter.	19.17324
F-statistic	4.006066	Durbin-Watson stat	0.736301
Prob(F-statistic)	0.046937		

RANDOM EFFECT MODEL

Dependent Variable: Y
Method: Panel EGLS (Cross-section random effects)
Date: 05/15/19   Time: 06:47
Sample: 2016 2018
Periods included: 3
Cross-sections included: 57
Total panel (balanced) observations: 171
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3516.186	443.5180	7.927945	0.0000
X	1116.144	843.8142	1.322736	0.1877

Effects Specification

	S.D.	Rho
Cross-section random	3248.712	0.9104
Idiosyncratic random	1019.430	0.0896

Weighted Statistics

R-squared	0.010018	Mean dependent var	644.2635
Adjusted R-squared	0.004160	S.D. dependent var	1033.270
S.E. of regression	1031.118	Sum squared resid	1.80E+08
F-statistic	1.710191	Durbin-Watson stat	1.659868
Prob(F-statistic)	0.192737		

Unweighted Statistics

R-squared	0.008912	Mean dependent var	3614.021
Sum squared resid	2.07E+09	Durbin-Watson stat	0.717043

UJI HAUSSMAN

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.897444	1	0.0269

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
X	949.590802	1116.143714	5664.153519	0.0269

Cross-section random effects test equation:
Dependent Variable: Y
Method: Panel Least Squares
Date: 05/15/19 Time: 06:47
Sample: 2016 2018
Periods included: 3
Cross-sections included: 57
Total panel (balanced) observations: 171

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3530.785	107.6641	32.79444	0.0000
X	949.5908	847.1639	1.120906	0.2647

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.943908	Mean dependent var	3614.021
Adjusted R-squared	0.915614	S.D. dependent var	3509.325
S.E. of regression	1019.430	Akaike info criterion	16.95596
Sum squared resid	1.17E+08	Schwarz criterion	18.02156
Log likelihood	-1391.735	Hannan-Quinn criter.	17.38833
F-statistic	33.36076	Durbin-Watson stat	2.426828
Prob(F-statistic)	0.000000		