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Share price Valuation model of Automotive Company in Indonesia

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***Abstract*— *Stock price valuation is a common thing done by a public company that sells its shares on the Stock Exchange or a company that will conduct mergers and acquisitions. This study aims to build a valuation model for automotive companies in Indonesia that trade their shares on the Indonesia Stock Exchange. The design of this study uses proposed sampling data of automotive companies on the Indonesia Stock Exchange. The results of the multivariate price to earnings ratio model showed that return on assets (P = 0.0081 <0.5%) had a significant effect on price to earnings ratio while the other four variables dividend pay out ratio, cost of debt, debt to equity ratio, and risk (beta) the effect on the price to earnings ratio for automotive companies is less significant. The result of the determination test shows the R-square value = 0.1603 or around 16.03% the stock price is determined by the independent variable used in the study and the rest (83.97%) is determined by other factors this is because the variable used in this study is still purposed sampling of the financial historical data, so that researchers can then do valuations using variables other than those used in this study.*

***Keywords*— Valuation, Free Cash Flow, Price to Earning, undervalued.**

I. INTRODUCTION

The automotive market in Indonesia still has a growing potential because motorization rate is still low at level 82 compared to the global average condition which has reached 187 car units per 1,000 population (*OICA: Organization Internationale des Consturctuerus d 'Automobiles, 2015*).

Table 1. Growth of Automotive Market (OICA, 2017)

	Rata-Rata Pertumbuhan	2016 vs 2006 (10 years)
Global	3.4%	1.4 x
Indonesia	10.0%	3.3 x

No	Negara	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2016 vs 2006
1	China	7,215,972	8,791,528	9,380,502	13,644,794	18,061,936	18,505,114	19,306,435	21,984,079	23,499,001	24,661,602	28,028,175	388.4%
2	Jepan	5,739,520	5,309,200	5,082,233	4,609,333	4,956,148	4,210,224	5,369,721	5,375,513	5,562,888	5,046,510	4,970,260	86.6%
3	India	1,750,892	1,993,721	1,983,071	2,266,269	3,040,390	3,287,737	3,595,508	3,241,302	3,177,005	3,424,836	3,669,277	209.6%
4	Korea Selatan	1,176,919	1,278,624	1,246,086	1,461,865	1,511,373	1,586,405	1,532,087	1,543,564	1,661,868	1,833,786	1,823,041	154.9%
5	Iran	971,000	1,037,900	1,190,000	1,320,000	1,642,843	1,688,194	1,044,430	804,750	1,287,600	1,222,000	1,448,500	149.2%
6	Australia	962,666	1,049,982	1,012,165	937,328	1,035,574	1,008,437	1,112,032	1,136,227	1,113,230	1,155,408	1,178,133	122.4%
7	**Indonesia**	**318,904**	**433,341**	**603,774**	**486,088**	**764,710**	**894,164**	**1,116,230**	**1,229,811**	**1,195,409**	**1,031,422**	**1,048,135**	**328.7%**
8	Thailand	674,953	631,181	615,270	548,870	800,357	794,081	1,423,580	1,330,672	881,832	799,632	768,788	113.9%
9	Sudi Arabia	556,100	554,400	540,000	520,000	600,000	590,000	705,000	740,000	828,200	830,100	655,500	117.9%
10	Malaysia	490,748	487,176	548,115	536,905	605,156	600,123	627,753	655,793	666,487	666,677	580,124	118.2%
11	Global	68,347,350	71,557,035	68,308,254	65,562,665	74,958,974	78,157,371	82,116,462	85,594,307	88,325,620	89,707,322	93,905,634	137.4%

This condition makes many brands of vehicles enter to Indonesia market to get the opportunity to enjoy the growth of the automotive market in Indonesia. According to (Joyce Dargay, Dermot Gately and Martin Sommer, 2015) who examined data based on 1960-2002 in 45 countries projected that vehicles in the world would increase from

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800 million units in 2002 to 2 billion units in 2030. GDP per capita also has a relationship with an increase in the number of vehicles (Joyce Dargay, 2015) when income the per capita income is between $ 3,000, - - $ 10,000, - the growth of vehicles is almost 2 times the growth of income while income per capita is $ 10,000 - $ 20,000 - growth is relatively the same as GDP growth.

Most of the companies on the Indonesia Stock Exchange (around 72%) offer their shares in a condition that is undervalued or lower than its intrinsic value (Paramitha et al., 2014) but other studies (Daljono, 2000), consider that company owners to avoid undervalued because of this will result in the transfer of wealth from the owner to the investor. This research will be interesting because it builds a model that will be used to assess the stock prices of automotive companies both those already on the Indonesia Stock Exchange and those that will make an initial public offering.

II. MATERIALS AND METHODS

Location and Research Design

This research was conducted in companies listed on the Indonesia Stock Exchange. For this study begins with an analysis of the financial statements of 10 selected companies which are used as samples to determine the variables that will be used in the company's analysis to determine the intrinsic value of shares of automotive companies in the Indonesia Stock Exchange.

Table 2. Automotive Company in Indonesia Stock Exchange

No	Kode Saham	Nama Perusahaan	IPO Date
1	ASII	Astra International Tbk	04-Apr-90
2	AUTO	Astra Otoparts Tbk	15-Jun-98
3	IMAS	Indomobil Sukses Internasional Tbk	19-Sep-93
4	TURI	Tunas Redian Tbk	06-May-95
5	GDYR	Goodyear Indonesia Tbk	01-Dec-80
6	GJTL	Gajah Tunggal Tbk	08-May-90
7	INDS	Indospring Tbk	10-Aug-90
8	MASA	Multistrada Arah Sarana Tbk	09-Jun-05
9	NIPS	Nipress Tbk	24-Jul-91
10	SMSM	Selamat Sempurna Tbk	09-Sep-96

The valuation model used is the valuation of the multivariate regression model of price to earnings ratio (PE) by using 5 independent variables calculated from the financial ratios of 10 automotive companies on the Indonesia Stock Exchange namely proxy risk (BETA), debt to equity ratio, cost of debt, dividend pay-out ratio and operation-return on assets.

Population and Sample

The population is 10 automotive sector companies (Table 2) which are already on the Indonesia Stock Exchange which have automotive related business units both manufacturing, distribution and dealers. The method used is purposive sampling / non probability sampling method, which means that the selection of 10 companies is done by ignoring the principles of probability, and only looking at the desired elements of existing data and with specific intentions. The selected company is a company that has made an initial offer (IPO) before December 31, 2005 to obtain sample adequacy on valuation using a multivariate regression model.

Data collection for fundamental top down approach analysis is done by retrieving the data of the website of the institution and department related to the automotive industry.

Table 3. Agency Websites and related research departments

Lembaga	Website
Bank Indonesia	www.bi.go.id
Badan Pusat Statistik	www.bps.go.id
Bursa Efek Indonesia	www.idx.co.id
Yahoo Finance	https://finance.yahoo.com

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Data on economic growth and projections used are economic growth data issued by the International Monetary Fund (IMF, 2017) and automotive market growth data is taken based on data released by the Organization Internationale des Consturctuerus d 'Automobiles (OICA). The collection of sample data of financial statements was taken from the official website of the related company for the period 2006-2016.

Table 4. Website sources of financial statements of automotive companies

Nama Perusahaan	Website
Astra International Tbk	www.astra.co.id
Astra Otoparts Tbk	www.astra-otoparts.com
Indomobil Sukses Internasional Tbk	www.indomobil.com
Tunas Redian Tbk	www.tunasgroup.com
Goodyear Indonesia Tbk	www.goodyear-Indonesia.com
Gajah Tunggal Tbk	www.gt-tires.com
Indospring Tbk	www.indospring.co.id
Multistrada Arah Sarana Tbk	www.multistrada.co.id
Nipress Tbk	www.nipress.com
Selamat Sempurna Tbk	www.smsm.co.id
Bintraco Dharma, Tbk	www.bintracodharma.com

In addition to the financial statements of the related companies researchers also took stock price data at the end of each month from December 2005 to December 2016 (133 data) for each company from https://finace.yahoo.com. Financial report data and stock prices that have been collected are then processed using Microsoft excels software to obtain financial ratios used for multivariate regression analysis, namely price to earnings ratio (PE), risk proxy (BETA), debt to equity ratio (DER), interest rate (I_R), dividend pay-out ratio (POR) and operation return on assets (ROA). Characteristics of samples and to assess the relationship of independent variables with PE were processed using Microsoft excels and EViews® 10+. As a comparison, the application of the model was chosen by two automotive companies in the Indonesia Stock Exchange that conducted IPOs in 2015 for the manufacturing sector, namely PT. Garuda Metalindo, Tbk (BOLT) and PT. Bintraco Dharma, Tbk (CARS) for the trade sector.

III. RESULTS

Sample Characteristics

The sample data period from 2006-2016 passed several economic conditions including the global financial crisis in 2008, commodity price boom between 2010-2012 and the decline in commodity prices in 2014. Conditions resulted in some stock returns and earnings being negative during the global financial crisis and when a significant decline in commodity prices. In this condition the researcher eliminated all that resulted in negative price to earnings ratio (PE) from the sample, so that out of 110 samples (10 companies x 11 years) were reduced to 70 samples.

Proxy Risk (BETA) is calculated based on the slope of the value of market return on stock returns of each company based on monthly data in a particular year (Table 9), debt to equity is obtained based on debt and equity data in the year-end balance sheet, the interest rate is calculated based on the interest rate on loans paid in a certain year (in the income statement) to the value of the debt at the end of the year, dividend pay out ratio is obtained from the dividend value paid for a given year (cash flow statement) to the value of earnings (income statement) and operation return on assets is calculated from EBIT value compare to total assets based on the annual report of each company.

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Table 5. Variable of Multivariate Regression

No	PE	BETA	DER	D_Int	Pay Out	ROA	No	PE	BETA	DER	D_Int	Pay Out	ROA
1	1,24	1,87	0,98	3,5%	53,4%	8,6%	36	24,21	1,59	0,14	12,0%	87,8%	2,6%
2	1,70	1,79	0,74	3,4%	27,9%	13,4%	37	23,63	1,61	0,10	12,4%	30,0%	3,1%
3	0,46	1,69	0,71	2,2%	34,5%	14,7%	38	0,60	1,49	0,45	6,1%	13,3%	7,6%
4	1,40	2,13	0,54	2,2%	34,7%	14,3%	39	2,58	0,74	0,28	6,5%	55,9%	2,8%
5	1,54	1,54	0,64	1,5%	44,5%	13,0%	40	2,69	0,79	0,07	6,0%	47,9%	3,3%
6	1,68	0,81	0,59	1,6%	46,1%	11,6%	41	28,01	1,51	0,10	15,9%	0,0%	3,4%
7	15,84	1,69	0,63	1,8%	50,3%	10,9%	42	1,77	0,45	1,51	10,4%	0,0%	12,9%
8	14,18	0,67	0,61	1,7%	51,6%	8,7%	43	9,54	1,51	1,10	9,8%	6,3%	12,4%
9	15,67	1,93	0,58	2,0%	53,2%	8,5%	44	14,78	1,36	0,86	9,1%	6,1%	8,7%
10	16,79	1,88	0,56	1,9%	73,2%	7,0%	45	54,59	2,32	1,08	9,3%	78,2%	8,9%
11	22,10	2,11	0,51	2,5%	53,7%	6,7%	46	17,98	2,39	1,13	9,7%	12,3%	7,3%
12	11,18	0,83	2,76	0,5%	119,3%	1,9%	47	6,40	5,84	1,27	10,0%	0,0%	8,4%
13	2,28	1,05	2,55	0,4%	3,9%	5,7%	48	2,83	2,14	0,71	7,9%	0,0%	16,7%
14	1,07	0,81	2,21	0,3%	31,3%	7,3%	49	5,88	1,13	0,33	9,2%	27,0%	12,8%
15	1,96	3,08	0,43	0,4%	75,5%	6,7%	50	7,16	1,13	0,15	11,3%	102,3%	9,3%
16	12,03	2,03	0,37	8,4%	8,3%	12,4%	51	7,20	0,98	0,15	10,0%	41,4%	8,0%
17	10,39	0,69	0,35	6,9%	8,7%	12,6%	52	10,95	2,16	0,13	11,2%	0,0%	3,6%
18	12,35	0,31	0,46	4,7%	9,3%	11,8%	53	6,85	0,15	0,44	8,8%	0,0%	9,1%
19	9,63	1,91	0,43	8,1%	25,8%	5,1%	54	9,67	2,29	0,56	3,7%	3,5%	8,5%
20	13,34	2,04	0,51	6,3%	22,0%	2,2%	55	21,39	0,37	1,32	4,2%	4,3%	6,0%
21	11,50	1,36	0,54	8,0%	23,0%	3,3%	56	0,50	2,51	0,98	4,3%	0,0%	4,2%
22	13,15	0,06	0,39	7,7%	20,2%	9,2%	57	0,29	1,90	1,31	5,4%	0,0%	6,6%
23	8,73	2,82	3,39	4,3%	0,0%	4,1%	58	0,11	0,22	1,12	9,5%	0,0%	9,6%
24	10,88	2,31	0,93	4,5%	4,4%	7,9%	59	6,66	3,37	1,98	6,7%	0,0%	9,6%
25	18,28	0,23	1,51	3,8%	20,3%	6,0%	60	20,60	0,56	1,49	4,7%	0,0%	5,4%
26	25,45	0,51	1,88	4,1%	15,1%	4,3%	61	9,71	0,51	0,71	7,7%	0,0%	6,7%
27	1,53	0,33	0,20	10,1%	31,4%	5,2%	62	1,69	0,60	0,26	9,7%	0,0%	16,1%
28	1,08	1,07	0,15	9,3%	15,3%	10,8%	63	1,38	0,39	0,35	31,2%	31,5%	22,9%
29	0,91	1,22	0,13	6,9%	43,6%	11,3%	64	2,30	2,28	0,33	5,6%	65,0%	20,2%
30	1,11	0,68	0,07	6,4%	30,0%	9,0%	65	2,54	2,18	0,54	8,5%	27,2%	21,4%
31	9,04	2,17	0,08	8,1%	43,0%	10,3%	66	2,87	0,22	0,39	10,3%	24,0%	24,7%
32	12,49	1,76	0,19	6,3%	44,7%	7,5%	67	3,70	0,62	0,44	8,1%	32,3%	25,2%
33	12,99	0,75	0,30	6,0%	27,5%	5,4%	68	4,29	1,41	0,23	11,0%	20,3%	32,4%
34	18,56	0,74	0,03	26,8%	55,4%	4,9%	69	3,60	0,05	0,22	8,1%	16,8%	27,2%
35	23,22	1,56	0,15	6,6%	47,3%	2,5%	70	11,25	0,71	0,10	9,8%	12,7%	29,6%

Source : Calculated by researcher based on financial statement and published share price

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Table 6. Return rate to calculate beta

No	Tingkat Pengembalian berdasarkan IHSG dan harga saham 10 perusahaan									
	IHSG	ASII	TURI	IMAS	AUTO	GJTL	GDYR	SMSM	MASA	NIPS	INDS
1	-0.00	-0.06	-0.06	0.32	0.04	-	-0.01	0.27	-	-	-
2	0.08	0.17	-	-0.40	0.02	0.03	0.02	-0.13	-	-	-0.43
3	0.11	0.04	0.16	0.25	0.03	0.08	-0.02	0.15	0.09	0.25	0.40
4	-0.09	-0.18	-0.05	-0.12	-0.03	-0.23	-	-0.03	-0.11	-0.07	0.12
5	-0.01	-0.01	-0.01	-	-0.03	-0.04	-0.16	-	0.06	-	0.13
6	0.03	0.58	0.02	-	0.19	0.04	0.67	0.02	-0.01	-	-
7	0.06	0.16	-	0.06	-0.03	-0.01	-	-	-	-0.14	-
8	0.07	0.12	0.03	-	0.04	0.13	0.01	0.29	-	0.24	-
9	0.03	0.08	0.02	-	-0.03	-	-0.02	0.08	0.14	-	-
10	0.09	0.34	0.11	-	-0.03	-0.07	-0.21	0.04	0.10	-0.23	-0.02
11	0.05	-0.02	-0.03	-	0.16	0.04	0.02	-0.01	-0.02	0.09	-
12	-0.03	-0.05	-0.03	0.09	-0.03	-0.02	-0.03	-0.11	0.02	0.07	-
13	-0.01	-0.05	-0.07	-	-0.04	-0.05	0.13	-	0.02	0.85	0.20
14	0.05	-0.06	0.05	-	-0.04	-0.06	0.19	-	0.07	-0.08	-
15	0.09	0.09	0.15	-	0.07	0.06	0.14	-0.03	-0.06	-0.13	-0.22
16	0.04	0.14	0.18	-0.20	0.07	0.06	-0.03	0.02	0.09	-0.20	0.81
17	0.03	0.03	-0.04	-	-0.02	0.05	0.03	0.02	-0.04	0.09	-
18	0.10	0.35	0.03	-	0.24	-0.02	0.05	-	0.00	0.09	0.07
19	-0.07	-0.05	0.02	0.16	-0.08	-0.11	-0.05	0.18	-0.15	-0.16	-0.27
20	0.08	0.08	0.14	0.27	0.06	0.02	-0.07	0.28	0.12	-0.06	1.56
21	0.12	0.33	0.09	0.67	0.05	0.04	0.09	0.12	0.02	0.17	-0.17
22	0.02	0.04	0.14	-0.22	0.03	-0.10	0.03	-0.03	-0.15	-0.14	0.04
23	0.02	0.09	-0.03	0.20	0.02	-0.01	0.32	0.05	0.10	0.23	0.17
24	-0.04	-0.00	-0.15	-0.16	-0.04	-0.14	0.12	0.15	0.09	-0.35	-0.12
25	0.04	0.02	-0.01	-0.02	0.05	-	0.38	-	0.11	0.17	0.13
26	-0.10	-0.13	-0.02	-	0.01	-0.11	-0.06	0.02	-0.06	-	0.12
27	-0.06	-0.18	-0.08	-	0.07	-0.16	-0.15	0.01	-0.02	-	-0.11
28	0.06	0.05	0.16	-	0.05	0.54	-0.09	0.16	-0.02	-0.22	-0.23
29	-0.04	-0.08	-0.08	0.02	-0.02	-0.13	-0.12	0.11	-0.04	0.98	-0.16
30	-0.02	0.55	0.27	-	0.64	0.02	0.14	0.71	0.09	0.22	0.43
31	-0.06	-0.08	-0.01	-	0.02	-0.08	-0.00	0.07	-0.10	-0.14	0.09
32	-0.15	-0.18	-	-0.06	-0.12	-0.23	-0.05	0.02	-0.11	-0.24	-0.32
33	-0.31	-0.45	-0.30	0.06	-0.36	-0.32	-0.20	-0.20	-0.28	-0.23	0.52
34	-0.01	0.85	0.03	-	0.69	-0.12	-	0.23	-0.04	0.10	-0.19
35	0.09	0.03	0.04	0.02	-0.03	0.23	-0.55	-0.24	0.04	-	0.33
36	-0.02	0.23	-0.29	0.01	-0.09	-0.11	-0.11	-0.46	0.04	-	-0.17
37	-0.04	-0.13	0.15	-	-0.09	-0.03	0.24	-	-0.06	0.01	-
38	0.12	0.26	0.62	-0.25	-0.01	0.14	-0.09	-0.14	0.17	-	-
39	0.20	0.26	0.06	-0.32	0.09	0.02	-0.05	-0.17	-0.06	-0.04	0.42
40	0.11	0.16	0.30	0.20	0.10	0.27	0.03	1.72	0.05	-0.31	-0.21
41	0.06	0.14	-0.02	0.25	-0.09	0.04	0.53	-0.28	0.04	0.75	-
42	0.15	0.63	1.55	-0.05	0.52	0.05	0.20	1.12	-0.04	-	0.30
43	0.01	0.03	-0.10	-	0.41	0.05	0.02	0.11	0.11	0.03	-0.07
44	0.05	0.11	-0.03	-	-0.01	0.31	0.02	0.17	0.43	-	0.17
45	-0.04	-0.06	-0.01	-	-0.01	-0.02	-0.02	0.13	-0.06	-0.06	-
46	0.02	0.14	0.03	-	0.20	0.06	0.12	-	-0.13	-	0.07
47	0.05	0.07	0.36	-	-	-0.02	0.01	0.09	-	-0.15	-0.13
48	0.03	0.04	0.09	-	0.13	0.08	-	0.13	-0.04	0.17	-0.15
49	-0.02	0.01	-	-	-0.02	0.24	-	0.28	0.01	-0.15	-0.23
50	0.09	0.16	0.14	-	0.11	0.40	0.33	0.18	0.34	0.17	2.29
51	0.07	0.13	0.30	-0.12	1.04	0.30	0.09	0.03	0.11	0.17	0.07
52	-0.06	-0.08	-0.20	0.03	-0.16	-0.17	-0.06	-0.29	-0.14	-	-0.07
53	0.04	0.12	0.01	0.28	0.07	0.13	-0.04	0.06	-	-0.12	-0.04
54	0.05	0.28	0.16	0.10	0.49	0.29	0.04	-0.01	0.04	-0.09	0.20
55	0.00	-0.06	0.05	2.48	0.06	0.40	-0.01	-0.14	-0.01	0.22	0.46
56	0.14	0.19	0.40	1.46	0.05	0.15	0.01	0.69	0.40	0.71	2.06
57	0.04	0.01	-0.17	-0.26	-0.04	0.17	-0.04	-0.05	-0.11	0.23	-0.04
58	-0.03	-0.01	-0.18	0.01	-0.02	-0.01	-0.12	0.01	-0.02	-0.06	1.24
59	0.05	0.05	-0.09	0.09	-0.14	-	0.15	0.02	0.03	0.03	-0.31
60	-0.08	-0.10	0.03	-0.12	-0.10	-0.01	-0.22	0.08	-0.15	-0.07	-0.07
61	0.02	0.06	-0.03	-	0.08	-0.10	0.04	0.03	-0.02	0.05	-0.08
62	0.06	0.10	-	0.12	0.01	0.09	0.01	0.06	0.22	-0.07	0.03
63	0.04	-0.01	-0.02	0.17	0.21	0.04	0.15	0.02	0.06	-0.08	0.18
64	0.00	0.05	-0.02	-0.02	-0.04	0.28	0.03	-	0.37	0.05	0.11
65	0.01	0.34	0.10	-0.05	0.17	0.05	-0.13	0.03	0.15	-0.12	0.43
66	0.06	0.11	0.20	0.53	0.21	0.05	-0.02	0.09	-0.05	0.25	0.15
67	-0.07	-0.06	-0.11	-0.10	-0.05	-0.11	-0.08	0.03	0.04	0.02	-0.25
68	-0.08	-0.04	0.02	-0.04	-0.17	-0.15	-0.02	0.06	-0.05	-0.20	-0.21
69	0.07	0.08	-0.06	0.15	0.08	0.11	-	0.02	-	0.35	0.09
70	-0.02	0.13	-0.02	0.06	-0.03	0.01	-0.02	0.07	-0.05	-0.17	0.05
71	0.03	0.04	-0.02	-0.02	0.06	0.08	0.06	0.14	0.02	0.14	-0.10
72	0.03	0.07	0.18	0.17	0.05	-0.03	0.29	0.24	-	-0.14	0.03
73	0.01	-0.10	-	-0.04	-0.06	-0.05	-	0.02	0.18	-0.01	-0.03
74	0.03	0.04	0.04	0.05	-0.01	-0.03	-0.02	0.03	0.05	0.13	0.18
75	0.01	-0.04	0.05	0.18	0.08	-0.04	-0.08	0.16	-0.08	-0.09	0.39
76	-0.08	-0.09	0.04	-0.10	-0.06	-0.05	0.07	-0.04	-0.12	0.10	0.01
77	0.03	0.33	-0.05	-0.11	0.05	-0.07	-0.07	0.03	0.04	0.06	-0.02
78	0.05	0.02	0.06	-0.13	0.06	0.03	-	-0.01	-0.08	-0.02	0.20
79	-0.02	-0.04	-0.03	-0.07	0.03	0.04	0.20	0.15	-0.15	-0.08	-0.09
80	0.05	0.10	0.08	-	0.04	-0.06	0.06	0.20	-0.02	0.05	-0.01
81	0.02	0.09	0.07	-0.11	-0.01	-0.04	-0.11	0.08	-0.06	0.35	0.07
82	-0.02	-0.09	-0.06	0.03	-0.01	0.01	-0.05	0.05	-0.11	-0.06	-0.07
83	0.01	0.04	0.07	-	-0.07	-	0.03	-0.06	0.28	-0.15	0.04
84	0.03	-0.03	-	-0.02	0.05	0.02	-0.02	0.04	-0.14	-0.01	0.01
85	0.08	0.08	0.01	0.05	0.06	-0.02	0.14	0.05	0.03	0.57	0.12
86	0.03	-0.01	0.02	0.02	0.03	0.14	-	0.01	-	-0.09	-0.05
87	0.02	-0.07	0.09	-0.04	-0.02	0.16	0.23	0.07	0.11	0.35	0.04
88	0.01	-0.04	-0.05	-0.01	0.13	0.11	0.42	-0.06	-0.11	0.11	-0.10
89	-0.05	0.01	-0.07	0.01	-0.03	-0.01	-0.06	0.04	0.07	-0.04	0.19
90	-0.04	-0.07	-0.15	0.01	-0.02	-0.18	0.05	-0.08	-	0.02	-0.13
91	-0.09	-0.07	-0.32	-0.09	-0.04	-0.28	-0.08	0.05	0.04	-0.01	-0.16
92	0.03	0.07	0.08	0.16	0.14	0.24	-0.10	0.17	-0.14	0.28	0.15
93	0.05	0.03	0.04	-0.09	-0.01	-0.01	-0.04	-0.07	0.04	0.51	0.11
94	-0.06	-0.05	-0.02	-0.03	-0.12	-0.22	-	0.42	-0.05	-0.22	-0.07
95	0.00	0.09	-0.04	-0.01	-0.05	-0.07	-	-0.04	0.11	-0.11	0.05
96	0.03	-0.06	0.14	-0.00	-0.08	0.12	-	-0.10	-0.13	-0.08	-0.07
97	0.05	0.08	0.07	0.07	0.07	0.16	-0.03	0.16	-0.04	0.04	0.08
98	0.03	0.06	0.04	-0.00	0.11	-0.03	0.03	0.11	-0.04	-0.10	-
99	0.02	0.01	-	-0.05	-	-0.10	-0.03	-0.10	-0.01	-0.03	0.01
100	0.01	-0.05	-0.02	-0.01	-0.06	-0.08	-0.03	0.15	0.01	-0.09	0.05
101	-0.00	0.05	0.05	0.03	0.04	0.04	0.03	0.07	-0.01	-0.02	0.04
102	0.04	0.06	0.07	-0.10	0.01	-0.01	-0.10	0.08	-0.04	0.07	-0.00
103	0.01	-0.02	-0.04	-0.03	0.03	-0.02	-0.01	-0.14	-	0.11	0.00
104	0.00	-0.07	-	0.05	0.08	-0.12	0.02	0.15	0.10	-0.10	-0.11
105	-0.01	-0.04	-0.11	-0.16	-0.08	-0.07	-0.02	0.03	0.26	0.05	0.05
106	0.01	0.06	-0.02	-0.11	-0.00	-0.09	-0.03	0.03	0.02	0.79	-0.21
107	0.01	0.04	-0.00	0.17	0.08	0.09	-	0.08	-0.01	-	-0.03
108	0.01	0.06	0.11	-0.01	-0.11	0.02	0.01	0.02	-0.12	0.04	-0.13
109	0.03	-	0.04	0.01	-0.01	-0.04	0.01	-0.04	-0.04	0.13	-0.13
110	0.01	0.09	0.04	0.03	-0.03	-0.05	-0.01	-0.05	-0.05	0.06	0.08
111	-0.08	-0.20	-0.01	0.02	-0.14	-0.17	0.01	0.06	-0.04	-0.01	0.04
112	0.03	0.07	0.01	-0.05	-0.05	-0.08	0.05	-0.02	-0.05	0.02	-0.22
113	-0.06	-0.01	-0.06	-0.05	-0.14	-0.15	-	0.00	-0.13	-0.01	-0.17
114	-0.02	-0.06	-0.05	-	-0.04	-0.12	0.15	0.05	0.03	-0.01	-0.10
115	-0.06	-0.11	-0.20	-0.18	-0.39	-0.33	0.09	0.02	-0.12	-0.32	-0.26
116	-0.06	-0.12	-0.01	-	0.06	0.05	-0.10	-0.08	-0.06	0.05	-0.33
117	0.05	0.14	0.07	-0.03	0.09	0.12	0.01	0.10	-	-0.20	0.05
118	-0.00	0.00	0.01	-0.15	-0.02	-0.09	0.69	0.03	0.00	0.17	-0.13
119	0.03	0.01	0.10	-0.08	-0.03	-0.01	-0.01	0.03	0.53	0.06	0.04
120	0.00	0.07	0.25	-0.09	0.01	-0.05	-	-0.10	-0.41	-	-
121	0.03	0.05	0.13	-0.02	0.11	-0.04	-	0.03	-0.11	-	0.07
122	0.02	0.07	-	-0.07	0.06	0.52	-	0.08	0.08	0.39	0.19
123	-0.00	-0.07	0.26	-0.05	0.04	0.08	-0.12	-0.02	0.06	-0.01	0.25
124	-0.01	-0.02	0.28	-0.09	-0.08	-0.11	-0.09	0.02	-0.09	-0.09	0.11
125	0.05	0.14	-0.05	-0.08	0.03	0.37	-	-0.00	0.05	-0.06	0.04
126	0.04	0.04	0.05	-0.06	0.04	0.66	-	0.00	-0.04	-	0.37
127	0.03	0.06	0.07	0.06	0.18	-0.07	0.02	-0.08	-0.07	-0.10	0.14
128	-0.00	0.01	-0.05	-0.11	0.02	-0.01	-0.07	0.11	0.02	-0.12	-0.16
129	0.01	0.00	0.02	-0.04	-0.05	-0.17	0.05	0.03	0.05	0.14	0.07
130	-0.05	-0.08	-0.08	0.07	-0.07	-0.20	-0.09	-0.12	0.61	-	-0.04
131	0.03	0.10	0.02	-0.06	-0.00	0.15	-0.05	-0.01	-0.13	0.04	0.02
132	-0.00	-0.04	0.04	-0.01	0.05	-0.00	-0.20	-0.10	-0.12	-0.17	-0.06
133	0.02	0.03	-0.00	-0.01	0.30	0.10	0.45	0.11	-0.15	-0.05	0.02

Source : Calculated by researcher based on data from http://finance.yahoo.com)

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Valuation of multivariate regression models

Model estimation results (Table 7) show that 16.03% (coefficient of determination R-square = 0.16028) PE value is affected by proxy risk (BETA), debt to equity ratio, cost of debt, dividend pay-out ratio and operation-return on assets. Those five variables that have a significant effect on price to earnings ratio are return on assets (P = 0.0081 <0.05) while the other independent variables have less significant effect (P> 0.05). Regression done with EViews® 10+ with the estimation equation as follows:

PE = 13.03 - 1.19 (BETA) - 0.58 (DER) + 1.00 (I_R) + 6.53 (POR) - 45.55 ROA

Table 7. Equation estimateion based on multivariate regression of price to earnings ratio (PE)

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: PE
Method: Least Squares
Date: 06/05/18 Time: 12:52
Sample: 1 70
Included observations: 70

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.02778	3.974722	3.277657	0.0017
BETA	-1.186908	2.118936	-0.560143	0.5773
DER	-0.578620	1.655983	-0.349412	0.7279
I_R	1.003394	1.031135	0.973097	0.3342
POR	6.527026	4.347696	1.501261	0.1382
ROA	-45.54631	16.65038	-2.735452	0.0081

R-squared	0.160128	Mean dependent var	9.513661
Adjusted R-squared	0.094513	S.D. dependent var	9.290629
S.E. of regression	8.840693	Akaike info criterion	7.278424
Sum squared resid	5002.103	Schwarz criterion	7.471152
Log likelihood	-248.7448	Hannan-Quinn criter.	7.354978
F-statistic	2.440413	Durbin-Watson stat	1.425248
Prob(F-statistic)	0.043592		

IV. DISCUSSION

The results of this study are in line with previous studies which stated that most of the companies on the Indonesia Stock Exchange (around 72%) offered their shares in an undervalued or lower than their intrinsic value (Paramitha et al. 2014). According to the efficient market hypothesis that a valuation can effectively explain the stock price on the exchange if the stock is included in an efficient market. This was explained by Fama (1970) that an efficient exchange is if the value of an asset or stock has reflected all available information, including information that is private.

Valuation of multivariate regression models

The valuation model with multivariate regression is estimated using data from 10 automotive sector public companies on the Indonesia Stock Exchange (Table 1) and the resulting equation must be tested for classical assumptions before being declared feasible to be used as a model for the stock price valuation of automotive companies on the Indonesia Stock Exchange. The results of classical assumptions (linearity, multicollinearity, autocorrelation, normalization, heteroscedasticity) are all fulfilled.

Table 8 shows the results of the linearity-Ramsay Reset Test test showing that the Prob F value (0.1389) is greater than the 0.05 alpha level (5%) so the regression model meets linearity assumptions.

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Table 8. Linierity test-Ramsay Reset Test

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Ramsey RESET Test
Equation: UNTITLED
Specification: PE C BETA DER I_R POR ROA
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.498715	63	0.1389
F-statistic	2.246147	(1, 63)	0.1389
Likelihood ratio	2.452259	1	0.1174

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	172.2011	1	172.2011
Restricted SSR	5002.103	64	78.15785
Unrestricted SSR	4829.901	63	76.66510

LR test summary:

	Value
Restricted LogL	-248.7448
Unrestricted LogL	-247.5187

Table 9 describes the results of multicollinearity tests using Variance Inflation Factors (VIF) test and based on the classical assumption conditions of linear regression with OLS, a good linear regression model is free from the presence of multicollinearity.

Table 9. Multicolinierty test –VIF

Command | Capture

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Variance Inflation Factors
Date: 06/05/18 Time: 13:06
Sample: 1 70
Included observations: 70

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	15.79841	14.14943	NA
BETA	4.489888	6.341368	1.128796
DER	2.742281	2.347551	1.123500
I_R	1.063238	1.931417	1.074771
POR	18.90246	2.567538	1.193025
ROA	277.2351	3.594931	1.099764

Because the value of the VIF of the variable does not exist more than 10, it can be said that there is no multicolinerality in the independent variable.

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Table 10. Autocorellation testLM (Lagrange Multiplier) Test.

Command | Capture

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	2.818314	Prob. F(2,62)	0.0674
Obs*R-squared	5.833583	Prob. Chi-Square(2)	0.0541

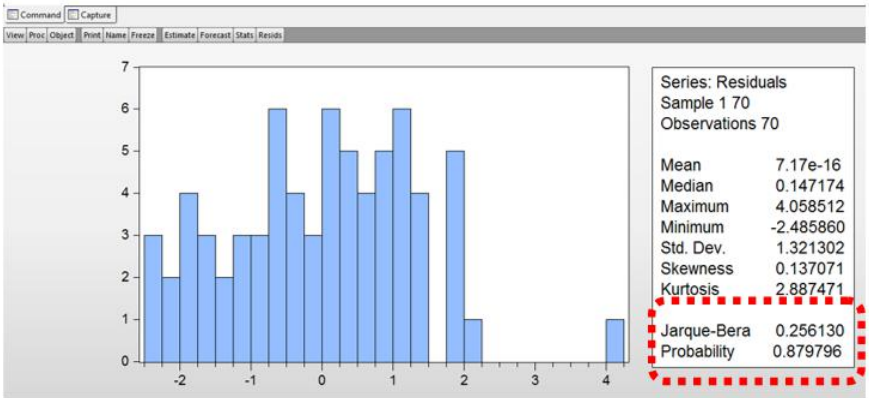
Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 06/05/18 Time: 13:07
Sample: 1 70
Included observations: 70
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.026162	3.922476	0.006670	0.9947
BETA	0.204626	2.073154	0.098703	0.9217
DER	-0.456413	1.629125	-0.280158	0.7803
I_R	0.018138	1.071712	0.016925	0.9866
POR	-0.507329	4.234826	-0.119799	0.9050
ROA	2.207122	16.23130	0.135979	0.8923
RESID(-1)	0.307414	0.129643	2.371228	0.0209
RESID(-2)	-0.092297	0.137245	-0.672495	0.5038

R-squared	0.083337	Mean dependent var	0.000000
Adjusted R-squared	-0.020157	S.D. dependent var	8.514355
S.E. of regression	8.599740	Akaike info criterion	7.248552
Sum squared resid	4585.243	Schwarz criterion	7.505522
Log likelihood	-245.6993	Hannan-Quinn criter.	7.350624
F-statistic	0.805232	Durbin-Watson stat	1.998039
Prob(F-statistic)	0.586146		

Table 10 shows the results of the autocorrelation test using the Brush-Godfrey or LM (Lagrange Multiplier) Test method and the result is the Prob value. F (2.22) of 0.0674 can also be referred to as the calculated F probability value. Prob value. F count is greater than alpha level 0.05 (5%), so that based on hypothesis testing, H_0 is accepted which means there is no autocorrelation.

Table 11. NormalityJarque-Bera (JB)



The results of the normality test using the JB (Jarque-Bera) method obtained a probability value of 0.879796 with a value of more than 0.05 (5%) meaning that the residuals were normally distributed. The last classic assumption test is heteroscedasticity test to find out whether the residuals and predictive values have a relationship or not, the results of testing using the Heteroskedacity test of Breusch-Pagan Godfrey, Prob value. F-statistic (F count) 0.2160 means that it is greater than the alpha level of 0.05 (5%) then H_0 is accepted which means that heteroscedasticity does not occur.

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Table 12. Heteroscedasticity Test

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.458029	Prob. F(5,64)	0.2160
Obs*R-squared	7.158216	Prob. Chi-Square(5)	0.2091
Scaled explained SS	22.42609	Prob. Chi-Square(5)	0.0004

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/05/18 Time: 13:11
Sample: 1 70
Included observations: 70

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.675951	87.15988	-0.076594	0.9392
BETA	-19.25126	46.46518	-0.414316	0.6800
DER	22.30419	36.31331	0.614215	0.5413
I_R	35.12732	22.61128	1.553531	0.1252
POR	215.3796	95.33866	2.259100	0.0273
ROA	-103.5506	365.1187	-0.283608	0.7776

R-squared	0.102260	Mean dependent var	71.45861
Adjusted R-squared	0.032124	S.D. dependent var	197.0545
S.E. of regression	193.8636	Akaike info criterion	13.45400
Sum squared resid	2405318.	Schwarz criterion	13.64673
Log likelihood	-464.8901	Hannan-Quinn criter.	13.53056
F-statistic	1.458029	Durbin-Watson stat	1.954329
Prob(F-statistic)	0.216003		

After the five classical assumptions of this equation are fulfilled, the next test is the model feasibility test, in this case there are three tests to be carried out. First, the F test or model feasibility test (Table 7) shows the prob value. (F-statistic) 0.043592 is smaller than the error rate / error (alpha) 0.05 it can be said that the estimated regression model is feasible. Second, the t test in multiple linear regression is intended to test whether the parameters (regression coefficients and constants) that are supposed to estimate the equation / multiple linear regression model have been the right parameters or not. Right here is the parameter capable of explaining the behavior of independent variables in influencing the dependent variable. The results of the t test are seen in the prob value. t count for ROA 0.0081 <0.05 means that ROA has a significant effect on the PE value of the automotive industry at 95% confidence level while for other variables prob. t counts greater than 0.05 means that the effect is less significant. Finally, the coefficient of determination explains the variation in the effect of independent variables on the dependent variable. Or it can also be said as a proportion of the influence of all independent variables on the dependent variable. In this study because it uses R-Squared and Adjusted R-Squared to determine the coefficient of determination, it can be seen that the values of R-Square = 0.16028 and Adjusted R-Squared = 0.094513 means the independent variable [risk (BETA) free variable, Debt to Equity Ratio (DER), Interest Rate (I_R), Dividend Payout Ratio (POR) and Operation-Return on Assets (ROA)] affect the price to earnings ratio of 16.03% and the remaining 84.97% is influenced by other variables not in the regression variable.

Based on the classical assumption testing and also the reliability test of the multivariate regression valuation model, PE estimation equations obtained can be applied to the valuation of automotive companies in the Indonesia Stock Exchange. For this reason, researchers applied the model obtained to assess the initial stock price of two automotive companies that were IPOs in 2015 and 2017. The selected companies represented automotive companies from the manufacturing and trading sectors, namely PT. Garuda Metalindo, Tbk for the manufacturing sector which conducted IPOs on July 7, 2015 and PT. Bintraco Dharma, Tbk for the trade sector which conducted an IPO on April 10, 2017.

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Table 13.Calculation of Beta in PT. Garuda Metalindo and PT. Bintraco Dharma

	ASII	TURI	IMAS	AUTO	GJTL	GDYR	SMSM	MASA	NIPS	INDS	Total
Beta	1,51	1,54	0,59	1,12	1,38	0,41	0,92	0,64	0,83	1,53	
Equity (Industri)	139.906	2.823	6.710	10.537	5.848	760	1.581	4.576	843	2.068	175.651
Beta x Equity	211.071	4.345	3.964	11.762	8.057	312	1.454	2.926	702	3.170	247.762
Leverage Beta	**1,41**										
Debt (Industri)	70.910	1.097	16.538	1.005	7.444	75	157	2.724	595	274	100.819
D/E	0,51	0,39	2,46	0,10	1,27	0,10	0,10	0,60	0,71	0,13	
Unlevage Beta	**0,99**		**D/E (BOLT)**	**0,08**	==>		**Leverage Beta (BOLT) =**		**1,04**		
D/E Industri	0,57										
Tax Rate	25,0%		**D/E (CARS)**	**0,51**	==>		**Leverage Beta (CARS) =**		**1,36**		

Source : Calculated by researcher based on financial statement

PE value for PT. Garuda Metalindo, Tbk obtained by the valuation model obtained in the study 8.5 times the earnings value of 192.3 billion rupiahs and the number of shares of 1.87 billion shares obtained the value of the stock price of Rp 870, -, while the initial stock price of Rp 750, - For PT. Bintraco Dharma, Tbk PE value obtained from the above model is 10.9 times (Table 5) with an earning value of 245.2 billion rupiah and the number of shares of 1.35 billion shares, the share value of Rp. 1,980, - , while the initial share price of Rp. 1,750, -.

Table 14. Price to Earning Ratio (PE) Variable Calculation

SAHAM	BETA	DER	I_R	POR	ROA	PE
BOLT	1,36	0,51	10,8%	30,0%	5,1%	10,9
CARS	1,04	0,08	13,2%	67,6%	17,1%	8,5

Source : Calculated by researcher based on financial statement

The implementation of the model in the valuation of stock prices in two automotive companies both in the manufacturing and trading sectors showed that both were undervalued, in line with previous studies (Paramitha et al., 2014). Empirical data also shows that stock prices have an increasing trend compared to the value of their initial share price when hold in the long term (Figure 1 and Figure 2) in accordance with efficient market theory where share prices will follow the information available on the market.

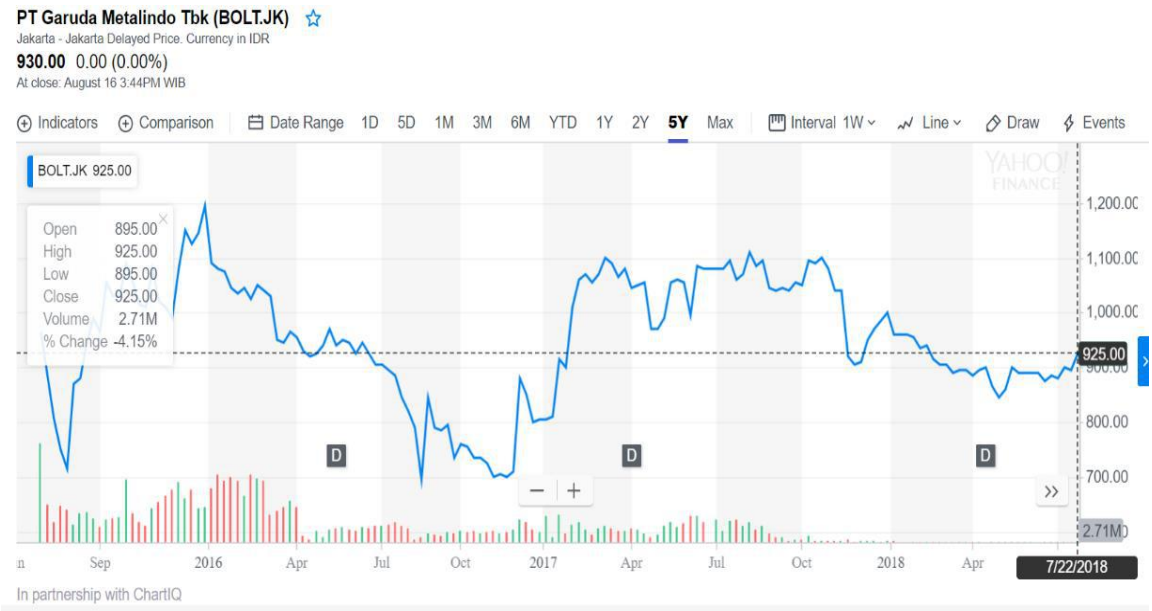

Fig.1: Share Price of PT. Garuda Metalindo, Tbksince IPO
(https://finance.yahoo.com)

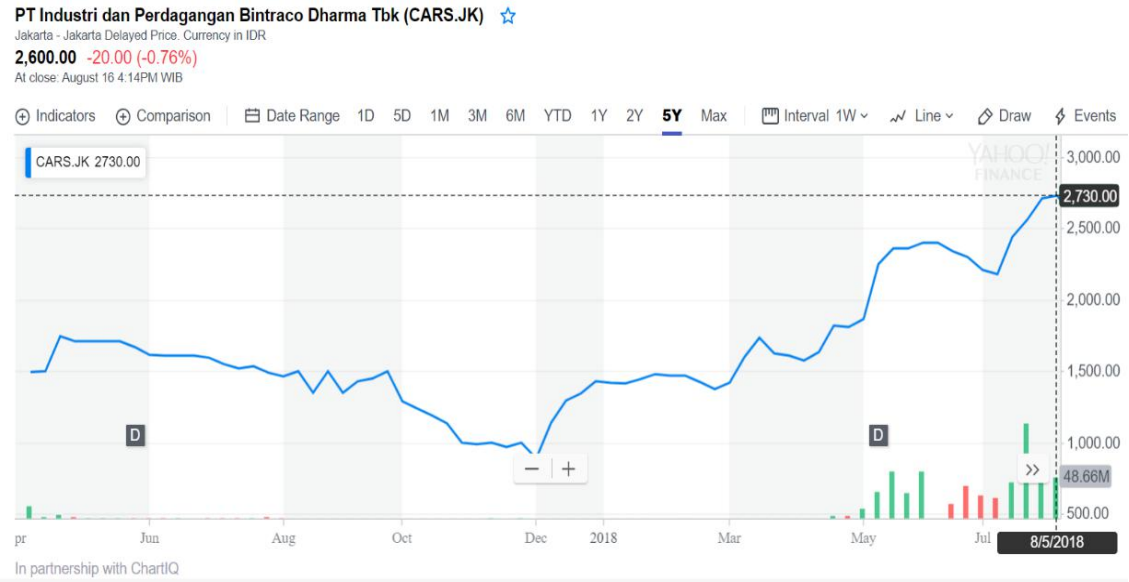

Fig.2: Share Price of PT. Bintraco Dharma, TbkSince IPO

(https://finance.yahoo.com)

V. CONCLUSIONS AND RECOMMENDATIONS

Researchers concluded that the model obtained in this study could be applied in the valuation of automotive companies in the Indonesia Stock Exchange, both automotive company in the manufacturing sector and also the trade sector, because they had met the classical assumption test and the determination test. Based on the independent variables that the researcher uses in this research shows that the level of influence on the estimated value is still relatively low, because the variables used in this study focus on financial statement variables that are influenced by various past factors, so that further researchers can develop using different variables not only variables obtained from financial statements but also external factors that can affect stock prices.

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