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**EQUITY REPORT ON CATERPILLAR INC.**

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## **ABSTRACT**

### **Equity Report on Caterpillar Inc.**

This paper is presented in the form of an equity report, aiming to evaluate Caterpillar Inc. per share value, comparing its market value with its fair value. This manuscript presents investors with two valuation methodologies – Market Multiples and the Adjusted Present Value – that define a target price range for Caterpillar’s stocks. The first model compares Caterpillar accountings with its major competitors’ data and in the second model a 10-year forecast valuation was built. Based on the referred methods and supported on the analysis of the firm’s performance and future outlook a sell investment recommendation was made by the author.

**KEY WORDS:** Caterpillar Inc., Equity Report, Multiples Valuation, Adjusted Present Value.

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## **1. INTRODUCTION**

Numerous times a company's market capitalization is not representative of the fair value of its equity, thus an equity report must be built in order to find if the value the market is attributing to that specific stock is consistent with its actual fair value. The purpose behind this paper is a personal interest on the firm's financial wealth and also on developing general equity valuation skills by the author. This report has the purpose to provide an investment recommendation concerning Caterpillar Inc.'s shares – either to buy or sell it, by comparing its current trading price with its fair value, after a sensitivity analysis on some key variables.

The report initiates with an overview of Caterpillar Inc., regarding its historical main facts and its business model. Furthermore, the author analyses the outlook that Caterpillar Inc.'s management has on the company's performance for the near future and gives his view on the outlook for the next 10 years of Caterpillar Inc. Moreover, the author makes an industry overview and an examination to the existing competitors on the wide Construction and Farm Machinery Industry in which Caterpillar Inc. is an enormous player, actually considered to be the number one. Once again the author analyses the future evolution of this industry's environment, considering the most relevant factors that can work out as “game changers”. Then the subsequent section is intended to explain the valuation methodologies used to assess Caterpillar's equity value, exposing the two valuation models put out in practice - the market multiples valuation and the discounted cash flows valuation (Adjusted Present Value) models. The models are explained and for each one a value per share for Caterpillar's equity is attained aiming to support the final section of this paper – the investment recommendation. As stated before, in the last section of this report the author presents its investment recommendation on the Caterpillar Inc.'s shares, meaning that the author gives its opinion on whether an investor should buy, sell or hold shares of Caterpillar Inc. The recommendation is based not only on the two valuation models but also on the previous study over the future of the industry and of the

company in the next 10 years. It is key to state that the final recommendation was built under the critical analysis of the author and that several assumptions were made through the report, thus this paper aims to give the author's view of Caterpillar Inc.'s equity value and if used for any investment purpose the investor should not rely solely on this document.

## **2. CATERPILLAR INC. - COMPANY OVERVIEW**

The 91-year company resulted from a merger of two competing firms - C. L. Best Tractor Company (established by Clarence Leo Best) and Holt Manufacturing Company (founded by Benjamin Holt) – being called at that time Caterpillar Tractor Company. The merger resulted in a first year of sales of \$13 million, growing to \$52 million in 1929. Not even the Great Depression on the 1930s could not stop the firm's climbing sales tendency.

By 1950, enjoying the effects of the post-World War II in terms of construction needs and pace of growth, the company began its global expansion. The company's growth was due not only to the fast growing sales but also to the acquisitions' policy followed by the firm management – acquiring smaller firms that were aligned with Caterpillar Tractor Company's core competencies. Only in 1986, under a reorganization of the company as a corporation it took its current name, Caterpillar Inc. Nowadays, Caterpillar Inc. has its headquarters in Peoria, Illinois, United States of America, having more than 100 manufacturing facilities around the globe, being the majority overseas. The company's Common Stock has as its major exchange listing the New York Stock Exchange (NYSE), since December 2, 1929.

### **a. Business Model**

As stated in its Annual Report (2015), Caterpillar Inc. is the number one producer and seller of construction, farm and mining equipment worldwide. Caterpillar Inc. is responsible for the production and sale of natural gas and diesel engines, diesel-electric locomotives, and industrial gas turbines. Additionally, the company distributes insurances through a global network of

dealers, markets a clothing line, produces work boots and even entered on the smartphone's industry with highly shock and water resistant models.

The company's operations are divided in three major categories of product segments: Construction Industries, Resource Industries and Energy & Transportation. Also, there is a fourth segment of huge importance in the company's business, the Financial Products segment. The Construction Industries segment has as focus the support of its customers through the usage of machinery in infrastructure and building construction applications. The Resource Industries segment is dedicated to customers' support with machinery in mining and extracting uses. The Energy and Transportation segment makes use of reciprocating engines, turbines, diesel-electric locomotives and related parts across industries serving power generation, industrial, oil and gas and transportation applications. The Financial Products segment is the responsible for offering financing solutions to both Caterpillar's customers and dealers for the purchase and lease of Caterpillar's equipment. The non-major segments produce revenues from the Caterpillar's engines and its components manufacturing and also from the remanufacturing services provided to other firms.

#### **b. Caterpillar Inc. Performance**

Caterpillar Inc. comes to the end of 2016 following a negative sales growth trend, more precisely a decrease of 10.4% on sales revenues over the last three exercises (2013-2015). This decrease is mainly justified by Caterpillar with the significant decrease in commodities price over the last years, particularly in 2015, but also by a decelerating economic growth and the consequent lower demand in countries like China and Brazil, where the firm has a substantial portion of its business. Within the several commodities' price drop the most relevant one was the low oil prices that had a large negative impact on the Energy and Transportation segment of Caterpillar, weakening the support services that Caterpillar performs in oil drilling and well servicing. Moreover, it was the declining sales volume that contributed for lower profit levels



on the last years. Currency was another unfavourable factor to Caterpillar's performance, as the year of 2015 was a period in which the US dollar strengthened against most of the currencies, for example against the currencies of Japan and Australia. Nevertheless, all the segments in which Caterpillar Inc. operates suffered a decline in sales volume during 2015: 17% revenues drop for Energy and Transportation, 14% decline in Construction Industries, Resource Industries presented a weakening of 15% on its sales revenues, and in the Financial Products segment revenues were 7% lower than in 2014. The forecast of the firm's management is that the volume of sales and the resulting revenues will decline even further in 2016.

**c. Future of Caterpillar Inc.**

As stated in section 2. b., Caterpillar's managerial team believes that the company's sales and revenues in 2016 will decrease when compared to 2015. Actually, if we observe the Caterpillar Inc.'s 3Q 2016 Earnings Release, published in the end of October, sales and revenues have declined comparing with the homologous 2015 quarter (\$9,160 million in 3Q 2016, 16% less than in 2015). Although there was this decline of sales, it was also possible to identify some good recovery signs for Caterpillar Inc.: first, both the construction industry and the firm's market position in machinery industry have improved in China, a huge market for Caterpillar; second, the year of 2016 has been a stabilizing year for commodities prices, which may improve Caterpillar's near future performance in the Energy and Transportation segment, since oil is one of the commodities that has been recovering this last year in terms of price<sup>1</sup>; third, Parts' sales volume has increased for the last two quarters; fourth, the restructuring efforts initiated in 2015, although they have costs associated, have helped the firm to narrow the third quarter costs by \$420 million (variable manufacturing costs alone decreased in \$234 million). This last point is beneficial to the company's growth and recovery since it allows the company

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<sup>1</sup> The last year's oil price data was obtained by consulting Bloomberg's Energy Index on both WTI Crude Oil (Nymex) and Brent Crude (ICE).

to keep investing in new products (investment in R&D). Relatively to the Financial Products segment the 2016 third quarter revenues were actually above the value obtained in the same quarter in 2015.

Moody's on its last revision of Caterpillar Inc.'s rating to a single A level, highlighted the last periods challenges faced by Caterpillar in terms of demand on its Resource Industries segment (less 25% than in the homologous period), but also the capability that Caterpillar has shown during its lifetime to successfully resist and recuperate from cyclical recessions. Moody's view is that the demand of Caterpillar Inc. after this downturn will face a slower growth than in other previous slumps. However, Moody's considers that Caterpillar won't fall from its top spot in the construction and mining equipment sectors due to its unquestionable strengths within its competitors, such as highest-quality of its equipment, the largest geographic footprint, the widest set of products and the best dealer network.

On its 2016 half year outlook Caterpillar pointed to a full-year sales revenues in the range of \$40,000 to \$40,500 million, and in the third quarter corrected that same outlook to a revenues value close to \$39,000 million. As will be seen in Chapter 4 of this paper the value used in the DCF valuation forecast is close to those values, considering that revenues will decrease 14% in 2016. As for the outlook of sales and revenues in 2017, Caterpillar Inc.'s sales are not expected to be much different than those of 2016, since in some regions of Africa and Middle East there was a deceleration of investment in general. However, the positive effects expected from the restructuring under way allied to the increasing stability and general rise of commodities prices that are essential to Caterpillar's business may be translated in an increase of revenues. As essential commodities one means not only oil but also mined commodities, that have risen as it happened to oil barrel prices.

Caterpillar Inc. is on the direction of turning up its performance and in the next years its business revenues will possibly start to increase as a result of the restructure of its cost structure

and improvement of the industry's conditions. There are several opportunities that Caterpillar may pursue to start its performance recovery, such as:

a) Still high growth potential and contracts to gain in countries like India, Brazil, China, and some other countries in Eastern Europe. For instance, the Asian Development Bank announced that it will spend around \$4.4 trillion on infrastructure investment until 2020. Also, on the same line the Indian government expects to invest around \$1 trillion in infrastructure until 2017. Moreover, Brazil is expected to invest close to \$0.9 trillion in the development of infrastructures in the next 5 years.

b) On other emerging markets, namely Bahrain, Qatar, Saudi Arabia, United Arab Emirates or Oman, there is one of the largest construction markets worldwide boosted by the ongoing population growth and oil business revenues. It is estimated that there are construction projects proceeding worth around \$2.8 trillion and it is expected that more than \$0.6 trillion will be spent until 2021 in Saudi Arabia and in the United Arab Emirates alone.

c) The firm has entered in new contractual arrangements in several business areas that may be beneficial to the firm's increase of revenues. Since last year Caterpillar Inc. has arrived to agreements with companies like: Rimco, the new Cuban dealer for Caterpillar; First Solar, in a joint venture to develop an integrated photovoltaic solar solution to be integrated in Caterpillar's solar panels; Uptake, a firm that will develop together with Caterpillar and end-to-end platform for predictive diagnostics, crucial in the optimization of Caterpillar clients' equipment; Ritchie Bros, a company that has agreed on a strategic alliance with Caterpillar aiming to quicken Caterpillar's digitalization of clients' equipment connectivity; and Fluidic Energy, resulting from an equity investment from Caterpillar, the two companies will cooperate to develop solutions for emerging economies on the field of energy storage.

d) Since Caterpillar Inc. already offers a wide range of products for the oil and gas industry, such as gas turbines or reciprocating engines, it could enhance sales growth due to the expected

increasing volume of the investment on the upstream segment of this industry. To be clear, companies in the oil and gas industry can be split in three segments: downstream, midstream and upstream. Upstream firms are the ones whose main business consist on the exploration and on the oil and gas industry's initial production phases. For those companies the investment on additional capacity, until 2040, is expected to be around \$7.3 trillion.

e) As stated previously, several other opportunities may arise from the savings coming from the restructuring measures applied by Caterpillar Inc. since the last year until 2018. The planning on the restructuring measures aims at achieve lower operating costs of about \$1.5 billion yearly, after the conclusion of the plan implementation. The announcement of the shutting of 30 facilities and the already put in practice reduction of the firm's personnel by 14,000 members will also contribute for a reduction of costs by Caterpillar Inc.

Therefore, Caterpillar Inc. has numerous occasions in which it can sustain its next years' growth of sales. Considering all those opportunities the author believes that the years following 2017 will represent an increasing sales growth on the following 10 years.

### **3. INDUSTRY AND COMPETITORS**

#### **a. Industry Overview**

In this topic the Caterpillar's industry characterization was split among the four main segments referred in the previous section "Business Model". To begin the first industry segment under analysis is the Construction Industries. This segment has been a target of a major shift from the developed to the developing countries in the last 10 years. Caterpillar in its Annual Report (2015) justifies that this swing was a consequence of the behaviour of the usual customers in each group of countries – developed and developing ones. On the one hand, customers on the developed countries in their investment decision-making process look for a balanced package of productivity and other performance measures that allow them to get lower operating costs

and lower lifetime ownership. On the other hand, on the developing countries customers have been giving more emphasis to find the lowest price charging supplier.

The Resource Industries segment customers' often give more significance to the equipment that displays high reliability, productivity and allows the customer to enjoy the market lowest ownership cost throughout the product's lifespan. As in the first segment analysed, in the developing economies customers stress the importance of the price of the equipment when deciding whether to take or not an investment. Regarding the segment of Energy and Transportation, there has been an increasing need from companies to research and develop emission technologies to comply with the regulatory emissions standards worldwide, for instance the regulation of the U.S. Environmental Protection Agency (EPA). So the environment in such segment is becoming more and more competitive through the development of technologies that allow the companies both to comply with the set standards and to improve their performance. As stated before this segment has been suffering from the low prices of commodities, being in a recovery phases as commodities' prices stabilize and smoothly increase. Finally, the Financial Products segment is characterized by its highly competitive environment once there are lots of viable options on customers' reach to receive financing, namely finance and leasing firms and also commercial banks.

#### **b. Competitors**

As stated in the previous section of this paper ("Industry Overview"), Caterpillar Inc. is present in several highly competitive segments of activity, ending up to face numerous competitors in each of those segments and some overall competitors in the wider Construction and Farm Machinery Industry. Following the firm's Annual Report (2015), in the segment of Construction Industries, the competitors' cluster contains some worldwide competitors, such as Terex Corporation, Komatsu Ltd., Deere & Company, CNH Industrial N.V., Astec Industries, Inc., and AGCO Corporation, but also a number of smaller specialized local

competitors - as examples we have Guangxi LiuGong Machinery Co. or Shandong Lingong Construction Machinery Co., Ltd., both being competitors in China. Also, Caterpillar Inc. faces a major global competitor on the Trucks production business, Paccar Inc. The segment of the Resource Industries puts Caterpillar Inc. “face to face” with a small number of global companies that play a big role in many markets the firm is present, namely Komatsu Ltd., Hitachi Construction Machinery Co., Ltd. and Kubota Corp. Additionally, there are also several small firms that compete with Caterpillar Inc. that whether present a smaller product range or play only regionally.

Then in the segment of Energy and Transportation, and more specifically in the sectors of production of reciprocating engines for maritime vehicles, systems of electric power generation along with turbines, oil and gas, Caterpillar faces few big international competitors and many limited players in terms of product-variety and range or geographic reach. As examples we can highlight Cummins Inc. and General Electric power generation subsidiaries. Also, concerning the transportation and packaging of engines and other components, Caterpillar faces worldwide competitors in various distribution channels, for instance in rail-related businesses there is fierce competition from companies such as Generac Power Systems, Inc. and Kohler Co. Finally, the division responsible for the Financial Product’s segment, Cat Financial, has numerous competitors, from banks to finance companies but also the financial subsidiaries of Caterpillar’s industrial competitors, for instance, Komatsu Fin. L.P. or Deere & Co. subsidiary - John Deere Capital Corporation.

### **c. Caterpillar and Industry Ratio Analysis**

This section aims to examine the evolution of several ratios of Caterpillar Inc. in the last 5 years, from 2011 to 2015, considering data provided by Bloomberg’s “Company in Depth Fundamentals”. The value of these ratios in the year-end 2015 was compared with the values

of peer companies in the Construction and Farm Machinery Industry, these firms were considered the most relevant competitors of Caterpillar Inc. in this industry (see Table 1).

Company	ROA	ROIC	ROE	Gross Margin	Current Ratio	Quick Ratio
Caterpillar Inc.	2.6%	5.3%	13.3%	25.3%	1.30	0.90
Deere & Co	3.3%	1.7%	24.5%	29.7%	2.06	1.88
Cummins Inc.	9.1%	15.5%	18.5%	25.9%	2.09	1.22
Paccar Inc.	7.7%	9.1%	23.4%	20.0%	2.57	2.39
Astec Industries, Inc.	4.1%	5.5%	5.5%	22.3%	3.82	0.91
Komatsu Ltd	5.1%	6.9%	9.0%	29.1%	1.98	0.98
Terex Corporation	2.5%	5.6%	7.5%	20.0%	2.16	0.96
AGCO Corp.	3.8%	7.0%	8.5%	20.9%	1.33	0.58
General Electric Co.	-1.1%	-1.1%	-5.4%	29.6%	1.61	1.40
CNH Industrial N.V.	0.5%	0.5%	5.2%	21.4%	5.56	4.40
Joy Global Inc.	-1.6%	-1.7%	-4.2%	21.8%	2.45	1.24
<b>Industry Average</b>	<b>3.34%</b>	<b>4.88%</b>	<b>9.25%</b>	<b>24.05%</b>	<b>2.56</b>	<b>1.60</b>

Table 1

First, in terms of profitability there are four major ratios that must be addressed: Return on Assets (ROA), Return on Invested Capital (ROIC), Return on Equity (ROE) and Gross Margin. These ratios are financial metrics that allow an investor to measure the capability of a firm or business to generate earnings considering its operating costs (such as costs of goods sold), the firm's assets, shareholders' equity and investment. ROA is the ratio that assesses the profitability of a firm against its total assets, giving an overview on the asset usage efficiency in terms of earnings generation<sup>2</sup>. It is computed by dividing the net income (or earnings) of the firm by its total assets' book value. Looking at Caterpillar's ROA over the last 5 years, it can be observed that this ratio has been declining from 6.78% (2011) to 2.58% (2015), averaging a value of 4.95% over that same period. Compared to the industry average, Caterpillar Inc. is clearly below the average ROA (3.34%), meaning that the firm's management team is being less efficient than its peers translating the money invested in assets into earnings.

The Return on Invested Capital or Return on Capital is another profitability ratio that aims to measure the return to capital holders generated by the investments made by the firm or, in other words, how effectively the firm is converting capital into profitable investments<sup>3</sup>. This ratio is determined by dividing the Net Operating Profit After Taxes (NOPAT) by the Invested Capital

<sup>2</sup> Sourced from Investopedia. <http://www.investopedia.com/terms/r/returnonassets.asp> (accessed 20 September, 2016).

<sup>3</sup> Sourced from Investopedia. <http://www.investopedia.com/terms/r/returnoninvestmentcapital.asp> (accessed 21 September, 2016).

of a firm. NOPAT is obtained by adjusting Operating Income or EBIT to reflect the firm's marginal tax rate, meaning that Operating Profit is multiplied by (1- marginal rate). Invested Capital can be estimated by summing the book values of a firm's equity and debt, and then subtracting non-operating assets. Regarding the ROIC, Caterpillar Inc. shows a similar evolution throughout the period within 2011 and 2015, a declining ratio from 13.46% down to 5.26% - with an average ROIC of 9.36%. This declining trend may reflect or be a warning sign that the company is having struggles in choosing how to properly choose investments. If we compare Caterpillar's ROIC with the industry average, 4.88% in the sample that is being considered, we can conclude that Caterpillar presents its ratio above the average of its overall competitors, however there are some firms, namely Cummins Inc., Paccar Inc., AGCO Corp. and Komatsu Ltd., that are clearly above the sample average. Hence, these four firms are the ones that are allocating their investments in the most worthwhile investments, mainly Paccar Inc. that is the only firm that has registered an upward trend on its ROIC level.

ROE shows the degree at which the company is generating profit from the money invested by shareholders in the company's equity. The formula used to assess this ratio is the following: net income (before dividends to common shareholders) divided by book value of common shareholders' equity (preferred shares not included). This is a ratio that allows to compare a company's profitability with others in the same industry, a high ROE may also indicate a high growth company<sup>4</sup>. Caterpillar Inc.'s ROE in the year-end of 2015 is above the average of the sample in Table 1 (9.25%), meaning that the company is proving to be more profitable than many companies in this industry although the difficulties over the last few years. Nevertheless, is also critical to highlight that Deere & Co., Paccar Inc. and Cummins Inc. present a much higher return on shareholders' investment than Caterpillar Inc. Moreover, Caterpillar Inc.'s ROE has been suffering a major decline from a high value of 41.57% (2011) to the current

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<sup>4</sup> Sourced from Investopedia. <http://www.investopedia.com/terms/r/returnonequity.asp> (accessed 22 September, 2016).



level, 13.32%. The firm's average value of ROE over the last five years was 26.34%. A DuPont Analysis was performed in order to assess the reasons behind the ROE shift<sup>5</sup>. The DuPont Analysis outcome for Caterpillar Inc. (2011-2015) is presented as follows in Table 2<sup>6</sup>:

Ratios	DuPont Analysis				
	2011	2012	2013	2014	2015
<b>Profit Margin</b>	8.19%	8.62%	6.81%	6.70%	4.47%
<b>% Δ</b>	-	5.24%	-21.06%	-1.65%	-33.22%
<b>Total Asset Turnover</b>	0.83	0.77	0.64	0.65	0.58
<b>% Δ</b>	-	-6.50%	-17.19%	1.66%	-11.47%
<b>Equity Multiplier</b>	6.32	5.10	4.08	5.06	5.30
<b>% Δ</b>	-	-19.38%	-19.99%	24.00%	4.82%
<b>ROE (DuPont)</b>	<b>42.83%</b>	<b>33.98%</b>	<b>17.77%</b>	<b>22.04%</b>	<b>13.66%</b>
<b>% Δ</b>	-	<b>-20.67%</b>	<b>-47.69%</b>	<b>23.98%</b>	<b>-38.03%</b>

Table 2

Finally, and still looking at profitability ratios, companies often compare to each other considering their Gross margin. Gross margin allows companies to measure the relation between their sales revenues and cost of goods sold:  $Gross\ Margin = \frac{(Revenues - Cost\ of\ Goods\ Sold)}{Revenues}$ <sup>7</sup>. Having a downward trend on the evolution of this ratio may create a necessity of labour costs reduction to drive the cost of goods sold down. In 2015 Caterpillar Inc. presented a Gross Margin of 25.31%. Compared to the sample on Table 1, Caterpillar is above the average but its most direct competitor, Komatsu Ltd., shows the capacity to have lower costs with its sales. Nevertheless, the restructuring efforts of Caterpillar Inc. are expected to improve its gross margin as there will be a strong reduction of labour costs.

Second, in terms of liquidity, there are two crucial ratios that must be analysed, the Current Ratio and the Quick Ratio. The Current Ratio is computed by dividing a firm's current assets by its current liabilities and it is representative of the capability of paying short term obligations

<sup>5</sup> According to the DuPont Analysis, a method for performance measurement, there are three ratios that affect and explain the ROE of a company: Profit Margin, Total Asset Turnover and the Equity Multiplier (or Financial Leverage). The objective behind this analysis is to assess which of the referred ratios affects the ROE the most. The DuPont Analysis follows the formula:  $ROE = Profit\ Margin * ATO * Equity\ Multiplier$ . Profit Margin is calculated by the division of the net income by the firm revenues in a given year. Then the Total Asset Turnover Ratio allows to evaluate how efficiently a firm is managing its assets in order to produce revenues, it is determined by dividing total revenue by total assets. Finally, the Equity Multiplier or Financial Leverage allows to verify whether a firm is purchasing its assets more with recourse to equity or debt. It can be computed by the ratio of total assets over total shareholders' equity (the higher this ratio is the more leveraged is the company). Moreover, the product of these three ratios allows us to analyse which of those is more responsible for shifts in the value of ROE. [Sourced from Investopedia. <http://www.investopedia.com/terms/d/dupontanalysis.asp> (accessed 23 September, 2016).

<sup>6</sup> Looking at Table 2, one can observe not only the ratios values for each year on the referred period but also the yearly change on each of those. Overall likewise the previously computed ROE, the ROE ratio under the DuPont Analysis has decrease over the last 5 years. From 2011 to 2012, the components that made ROE drop were both the Total Asset Turnover and the Equity Multiplier, as these have clearly more weight in this formula and Profit Margin was the only component to grow. Between 2012 and 2013, all the ratios declined in double figures, however once again as the Total Asset Turnover and mainly the Equity Multiplier have a higher weight on ROE, those were the foremost responsible for the ROE decline. On the period 2013-2014 it is observable an increase in ROE, clearly due to a huge increase of Financial Leverage (24.00%). Finally, between 2014 and 2015, the main conductors of the 38.03% reduction of ROE were Profit Margin and Total Asset Turnover both declining in two digit numbers (33.22% and 11.47%, respectively). In this last period although Financial Leverage increased again it was not sufficiently high to offset the other ROE formula components' shifts. Globally, between 2011 and 2015, it can be stated that Financial Leverage has been the factor that mostly affect the variation of Caterpillar's ROE value. Hence, Caterpillar's relies heavily on debt financing, a fact that can be linked to high interest payments and to a reduction of earnings.

<sup>7</sup> Sourced from Investopedia <http://www.investopedia.com/terms/g/grossmargin.asp> (accessed 23 September, 2016).

of that same company<sup>8</sup>. The higher the value of this ratio the financially healthier the company is in the short term. It must be noticed that from the industry sample on Table 1, Caterpillar Inc. is the company that has the worst Current Ratio, however as its ratio is still above 1, there is no big concern around Caterpillar's ability to comply with its short term commitments. Then, the Quick Ratio is another short term liquidity pointer but considering only the firm's most liquid assets, meaning that inventories are excluded from current assets as they are more difficult to convert in cash in a short period of time<sup>9</sup>. Relying on the previous statement, the Quick Ratio can be attained by summing cash and equivalents with account receivables and marketable securities and then dividing that value by current liabilities. Once again, the higher the Quick Ratio is the better off is the firm in terms of short term liquidity. Caterpillar is among the worst companies in the industry sample in terms of the value of its Quick Ratio, 0.90.

#### **d. Future of the Construction and Farm Machinery Industry**

This section aims to analyse how may the Construction and Farm Machinery Industry be in the following years. As already stated, this industry has been suffering from the effect of low price for commodities essential to the business, for instance oil and other mining commodities (iron ore and coal). The close future outlook regarding this factor seems to be good for this industry that highly relies on the prices of the referred commodities – in 2016 oil prices have stabilized compared to 2015 and those prices have been presenting a slightly upwards trend since the beginning of 2016. Moreover, this industry is already a highly competitive one and that tendency is likely to keep growing since more and more companies are trying to gain market share and build revenues by pursuing business opportunities in emerging markets. China is likely to be one of the main stages of fierce competition as that market attractiveness is huge due its dimension (around 16% of worldwide spending in construction), but other countries like India, Brazil, Saudi Arabia and the United Arab Emirates will also be very valuable

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<sup>8</sup> Sourced from Investopedia <http://www.investopedia.com/terms/c/currentratio.asp> (accessed 24 September, 2016).

<sup>9</sup> Sourced from Investopedia <http://www.investopedia.com/terms/q/quickratio.asp> (accessed 24 September, 2016).

geographies for companies in this industry as already stated in section 2.c. It is also extremely relevant to highlight the fact that due to the dimension of the Chinese market for construction and considering the protection of the Chinese interests by the Chinese government, we are likely to see more and more Chinese companies entering into this market with better and more automated manufacturing processes capable to challenge the market big players.

Another crucial factor for the companies competing in the Construction and Farm Machinery Industry in the next years will be the adequacy of their manufacturing facilities to the emission regulations set by the regulatory authorities. Hence, all the players in this market will need to invest heavily in R&D to be able to comply with the new set of environmental regulation imposed. Moreover, R&D investment will be the great focus of the firms in this industry since the last years' low revenues have created the need to drop operating costs in most of the companies. As the market environment in this industry becomes more and more competitive R&D investment may be the differentiate factor to the top players, as more effective and technologically developed products are introduced to the market.

#### **4. FIRM VALUATION (TWO METHODOLOGIES)**

To build the final investment recommendation on Caterpillar Inc.'s shares, two valuations were performed aiming to compare its fair per share value with the current firm's market price. The objective is to appreciate whether the company's stocks are currently traded at, above or below their fair price. As stated before, two approaches were made: first, the market multiples valuation and then the discounted cash flow valuation (APV model).

##### **a. Multiples Valuation Model**

This methodology follows the principle that it is possible to compare the assets' value of two or more firms in the case those firms are comparable among them. With this in mind, the industry average multiples may be used to estimate the value of a specific enterprise without the need of using forecasting tools. Nevertheless, although this model of valuation represents

a faster and simpler means to estimate a firm's fair value, a cautious analysis of that value should be performed. The accounting data behind the estimation of such company's value comes from comparable but non-equal firms and the final value of the firm is obtained through averaging such industry players' data. That is the reason behind using not only one valuation method but two, in order to reinforce this first valuation results. By non-equal firms one means that even those firms compete in some industry as the company being evaluated, they will never have the exact same business model or capital structure.

In this multiple valuation method three ratios were chosen, being considered the more adequate to evaluate Caterpillar Inc. The utilized accounting information were the earnings (net income available to common shareholders), revenues from sales and the book value of each comparable firm. Thus, this data assemblage was used to compute three ratios – the price-earnings ratio, the price-to-sales ratio and the price-to-book ratio<sup>10</sup>. The comparable firms selected all operate in the Construction & Farm Machinery Industry. Eight main competitors were considered: Deere & Co., Cummins Inc., Paccar Inc., Astec Industries, Inc., Komatsu Ltd., Terex Corporation, AGCO Corp. and General Electric Co. Data such as earnings (net income available to common shareholders), revenues from sales and the book value - was collected from the companies' quarterly report, from the 3Q 2015 until 3Q 2016. The market

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<sup>10</sup> The price-earnings ratio is the quotient between a firm's market capitalization (share price times number of shares outstanding) and its annualized earnings – both market capitalization and earnings can be used in per share terms also. It is commonly used as an indicator of the price at which the market is willing to buy a stock having as basis the firm's earnings at that moment [Sourced from Investopedia. <http://www.investopedia.com/terms/p/price-earningsratio.asp> (accessed 25 September, 2016)]. A high P/E ratio usually is indicative of high expectations on the share price of that company, because of that investors' disposition to pay more for those shares increases. It is a very useful way to compare firms within the same industry but it certainly has its limitations. A P/E ratio on its own may mislead an investor's perception of the value of the company, this ratio is actually only useful if there are ratios of peer companies to make a reliable comparison. A second issue with this multiple is that it can suffer from the effect of leverage – the more debt outstanding a firm has the more likely it is to present a lower P/E ratio, which may be the case of Caterpillar Inc. that presents a huge ratio value compared to most of its peer firms. Then, the price-to-sales ratio aims to compare the market capitalization of a firm with its sales revenues. This ratio is computed by simply dividing the current market capitalization by the twelve-month trailing revenues (sum of revenues of a one-year period, usually the quarterly reports are used to assess those values of revenues). In the analysis of this ratio investors commonly associate a firm with a low price-to-sales ratio to a possible undervaluation of that firm's shares, on the other hand the opposite – a very high ratio – may be an indicative of an overvaluation of the firm. Finally, the price-to-book ratio puts into comparison the market price of a firm's shares and the correspondent book value of shareholders' equity. Hence, this ratio is attained by dividing a firm's current market share price by its per share book value of equity. [Sourced from Investopedia. <http://www.investopedia.com/terms/p/price-to-salesratio.asp> (accessed 25 September, 2016)] Usually, investors assess whether a firm's price-to-book value is above or below one. A price-to-book ratio below one may indicate that the firm's assets are being overvalued. [Sourced from Investopedia. <http://www.investopedia.com/terms/p/price-to-bookratio.asp> (accessed 26 September, 2016)] On this line if a firm is overvaluing its assets it is likely that investors will incur in negative returns after a possible correction of the firm's assets value. Also, a below one ratio may indicate that the ROA of the firm is very low. This ratio is highly correlated with the ROE thus it is normal to see ROE growing at the same time as the price-to-book ratio is growing. On the other hand, if this relation does not sustain and each of the ratios vary in opposing ways it can be seen as a warning signal of overvaluation of a firm. This is an interesting ratio to be used in the Construction & Farm Machinery Industry since it is a capital-intensive industry. However, one must be careful when analysing this ratio due to the effects of leverage – highly leveraged companies, such as Caterpillar Inc., present very high levels of liabilities distorting its book value of equity and its price-to-book ratio. All these 3 ratios or multiples are equity multiples - Suozzo, P., Copper, S., Sutherland, G. and Deng, Z (2001) believe that these are the more adequate for equity valuation matters as in an equity report, and also more reliable than other multiples such as enterprise multiples due to the higher subjectivity the latest imply.

capitalization of the firms was computed by multiplying the shares outstanding and the closing price of the 23<sup>rd</sup> of December 2016. Observing the market capitalization of the referred companies, there is a value interval between \$1.4 and \$27 billion, on the other hand Caterpillar's market capitalization as well as General Electric Co.'s market values are well above those values, \$52 billion and \$262 billion respectively. Bearing in mind the existence of a huge gap between the comparable firms' equity market value, it was decided that all those firms should be included in the estimation of Caterpillar's equity value since those are the most direct competitors of the firm under study, allowing to get more trustworthy average multiples regarding this industry (see Table 3). The estimated equity value of Caterpillar Inc. is the average value between the resulting valuations based on each of the chosen multiples<sup>11</sup>, \$42,930 million. The number of shares outstanding to be used is 585.07 million<sup>12</sup>, meaning that the estimated price per share for Caterpillar Inc. is \$73.38. The price per share computed is significantly below its current market value, \$94.34<sup>13</sup>. The highest per share value obtained comes from the price-to-sales multiple (\$87.92), however this value is far from the current market value. Though, this value must be carefully analysed due to the significant gap between the current price and this target price. The understanding on the target value thus may be that Caterpillar's stocks are overvalued, but this methodology alone is not sufficient to incur in a reliable conclusion, thus the discounted cash flows model was also put in practice.

CAT Competitors	Multiples		
	P/E	P/Sales	P/BV
Caterpillar Inc.	54.26	1.38	3.53
Deere & Co	21.44	1.22	4.98
Cummins Inc.	18.94	1.30	3.38
Paccar Inc.	39.84	1.32	3.28
ASTECC Industries, Inc.	33.78	1.50	2.43
Komatsu Ltd	22.42	1.46	1.73
Terex Corporation	66.02	0.56	1.82
AGCO Corp.	29.77	0.64	1.60
General Electric Company	27.48	2.29	3.44
<b>Average of the Industry</b>	<b>32.46</b>	<b>1.29</b>	<b>2.83</b>
<b>Caterpillar Inc. Equity Value (million)</b>	<b>\$33,013</b>	<b>\$51,442</b>	<b>\$44,338</b>
<b>Caterpillar Inc. Equity Value per share</b>	<b>\$56.43</b>	<b>\$87.92</b>	<b>\$75.78</b>

Table 3

<sup>11</sup> On Table 3, P/E stands for price-earnings ratio, P/Sales for price-to-sales ratio and P/BV is the price-to-book ratio.

<sup>12</sup> The number of shares outstanding was collected from the most recently filed quarterly report - 585.07 million shares outstanding.

<sup>13</sup> As of December 23, 2016, close price adjusted for dividends and splits (source: Yahoo Finance).

**b. Adjusted Present Value Model (APV)**

As stated previously, besides the utilization of the multiples valuation model there is the need to use a forecasting analysis through the discounted cash flows valuation model. Contrarily to the first method employed, that estimates an equity value for Caterpillar Inc.'s shares by looking to its own past data and also of its industry (from their last quarter report), the discounted cash flows valuation model allows us to make an assessment on the company's future circumstances. Such future forecasts are made considering the company's historical performance, market place conditions, the expected economic environment and market trends. The methodology used was the Adjusted Present Value Model (APV) which is considered to be one of the most reliable models used in equity valuation. The APV model is more robust than other models as the WACC or the Residual Income mainly because it implies fewer assumptions and also it provides the value created by the firm fragmented between the company's business value and the value resulting from the tax shields. Moreover, there is no certainty regarding the evolution of the debt-to-equity ratio of Caterpillar Inc., being this other advantage of using APV instead of the WACC model that assumes a constant debt-to-equity ratio. The APV model can be split in 4 different parts.

Part 1 – Caterpillar Inc.'s Unlevered Value

The base-case was built upon several assumptions that lead to a forecast of the next 10 years' performance of the firm. Considering the company's last years' evolution of sales revenues, representing a decline from 2012 up until 2015, the forecast for the next years was based on the premise that Caterpillar Inc.'s sales revenues will still decline in 2016 (-14%), but afterwards those revenues would start to gradually increase, there were considered annual sales growth rates of 3% in the year 2017, 5% for 2018 until 2021, 7% for 2022-2024, and 8% for 2025. The operating costs associated to those sales were considered to grow on the same direction as sales but at a slower pace due to the positive effect of the restructuring being

implemented by the company (respectively, -12%, 0.5%, 1.5%, 2.5% and 3%). Having these values, it was possible to estimate the EBITDA for the defined period (2016-2025). The following step was to subtract depreciation and amortization to get the EBIT. The variation of the value of these cash outflows was considered to be the same as the average growth rate in the period 2013-2015 (-0.62%), so on every year the depreciation and amortization value decreases for that percentage relatively to the year before. Next the tax rate put in practice was the statutory tax rate of Caterpillar Inc., 35%. To reach the company's forecasted Free Cash Flows (FCF) it is necessary to add back depreciation and amortization, as well as the variation of the Net Working Capital (NWC) - considered to be zero for this period, since there was no NWC variation since 2005 – and the Capital Expenditures (CAPEX) – average value from the period between 2013 and 2015, used for the forecast.

As in any DCF valuation, there is the need to define an appropriate discount rate and a terminal value for the firm. To compute the appropriate discount rate it was used the CAPM model, allowing that discount rate to reflect the riskiness of the company's business as well as considering the company and market return. So, to compute this rate it was used the following formula:  $r_u = r_f + \beta * (E(r_m) - r_f)$ . The discount rate,  $r_u$ , is the sum of the risk-free rate with the Caterpillar's stock beta (representing the stocks' sensitivity to the market shifts) multiplied by the market risk premium (the excess return from investing in stocks over risk-free treasury bonds). The risk-free rate is the average of the 10-Year Treasury Constant Maturity Rate (monthly data) from the last 5 years. The expected market return is the average excess return of the S&P 500 in the last 5-year period. The Caterpillar's beta was estimated through a regression, having as variables the excess return from the S&P 500 as well as of Caterpillar's stocks. At this stage the APV model begins to depart from the other DCF valuation methods such as WACC, as the CAPM model allows to calculate the all-equity return rate (as if the firm was financed entirely by equity) instead of computing a return rate that depends on both equity

and debt return rates. Once the appropriate discount rate is estimated it is used to discount each FCF to its present value (17.99%).

### Part 2 – Caterpillar Inc.’s Value of Tax Shields

The second part of this model aims to estimate the Caterpillar’s Value of Tax Shields. The value of tax shields can be defined as the difference between the present value of taxes for the unlevered firm and the present value of taxes for the leveraged firm (P. Fernández, 2006). The value of tax shields represents the increase in the firm’s value resulting from the tax saving due to interest payments. Considering this definition, in the case of a perpetuity and a world where there are no costs of leverage, the value of tax shields can be computed by multiplying the corporate tax rate by the value of debt outstanding, as of the 3Q 2016. This methodology was chosen because there is few information on a consistent and accepted way to calculate the costs of leverage and how the amount and type of debt and taxes influence that value, and therefore, it was considered that there were no leverage costs in this valuation. Fernández (2006), states that this formula represents the value of tax shields under the assumptions that the market debt-to-equity ratio will remain constant over time and that the risk of interest tax shields equals the risk of operating assets thus the formula can be written as the following:  $PV(\text{interest tax shields}) = \frac{D * r_D * T}{r_E}$ . As it considers that debt remains steady, in absolute terms, interest tax shields will be equal every year so it can be valued as a constant perpetuity,  $PV(\text{interest tax shields}) = D * T$ . The computed value of interest tax shields for Caterpillar was \$12,989 million. As seen before, taxes play a crucial role in the determination of the firm’s capital structure because interest is tax deductible and profitable firms can try to lower its taxes by increasing outstanding debt. However, if the company depends too much on debt, its customers and suppliers concerns about a possible event of bankruptcy increases, which can compromise company’s future cash flows. So, in the next Part of this valuation model we are going to analyse the expected bankruptcy costs associated with debt level.



### Part 3 – Caterpillar Inc.’s Expected Bankruptcy Costs

The third part of this methodology deals with the costs associated with a bankruptcy event of Caterpillar Inc. It was used a method that can be split in two steps: (a) first, it is estimated a probability of bankruptcy for the firm, (b) then it is defined how much would the costs be if the company goes bankrupt. Regarding Caterpillar’s bond rating, for the purpose of this valuation, it was considered an A2 rating level, attributed by Moody’s Investors Service (that corresponds to an A rating class on S&P scale), meaning that Caterpillar’s probability of non-compliance with its financial obligations should be low. On step (a) it was considered that to each bond rating class there is a corresponding default rate<sup>14</sup>, relying on the global corporate annual default rates to the A rating class verified between 2000 and 2014. So, for a single A rating bond class the S&P Ratings Services verified a 0.082% average default rate on the referred period, and that was the value considered as Caterpillar’s probability of bankruptcy. On step (b) it was defined that in the event of bankruptcy Caterpillar Inc.’s indirect costs would represent 25% of the value of the firm, computed in Part 1. To justify this value, it was considered the rationale of:

- Korteweg (2010), who used market prices of debt and equity of firms nearly bankrupt to compute bankruptcy costs from the net-benefits to leverage, states that bankruptcy costs range between 15-30% of the firm’s value.

Regarding the direct costs, including expenses such as legal, court-related fees and expenses with advisory firms that may result from an event of bankruptcy, it was considered reasonable to value those at 5% of the firm’s value. Also, the given percentage is in line with:

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<sup>14</sup> The correspondence was based on the *Default, Transition, and Recovery: 2014 Annual Global Corporate Default Study And Rating Transitions* by Standard & Poor’s Ratings Services.

- A study conducted by Weiss (1990), on which the author evaluated 37 bankruptcy events on the period 1980-1986, finding that direct costs associated to those bankruptcies averaged 3,1% of the firm's value;
- Damodaran (2002), who believes bankruptcy direct costs usually stand between 5-10% of a company's total value.

Under this assumptions the total bankruptcy costs for Caterpillar Inc. represent 30% of the value of the firm on this valuation. The value attributed to the costs inherent from a bankruptcy of Caterpillar Inc. is aligned with the following authors:

- Davydenko et al. (2012), calculated firms' distress costs based on the market value changes following their announcements of default, under the assumption that investors do not fully anticipate default. These authors estimated that average costs of distress for investment-grade firms was, on average, 28.8%.
- Reindl, Stoughton and Zechner (2013) study on market implied cost of bankruptcy resulted in an estimated total cost of bankruptcy ranging between 20% and 30%, "by inference from market prices of equity and put options using a dynamic structural model of capital structure".

Finally, the values obtained in (a) and (b) were multiplied, reaching a value of expected bankruptcy costs of \$20.69 million, as presented next: *Expected Bankruptcy Costs = 0,082% \* 30% \**

*Firm Value = \$20,69 million*<sup>15</sup>.

#### Part 4 – Caterpillar Inc.'s Per Share Value

The last part of this valuation technique aims to join all the previous computed values, additionally it was also added the book value of cash and equivalents and marketable securities to reach the value of the firm: *Caterpillar's Value = Firm's Unlevered Value + Value of Tax Shields +*

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<sup>15</sup> Although the final value of expected bankruptcy costs is presented, the firm value in the formula is only obtained in Part 4.

*Cash & Equivalents + Value of Marketable Securities.* Afterwards, the expected bankruptcy costs are included since they deduct value from the firm. Thus, these costs are subtracted from Caterpillar's value. At this stage we have a value of \$84,092 million as the firm value, after deducting the potential costs in a bankruptcy event. Lastly, to estimate the equity value of Caterpillar Inc., the book value of debt (3Q 2016) has to be taken from the company value, since:  $Caterpillar's\ Value = Equity\ Value + Debt\ Value \Leftrightarrow Equity\ Value = Caterpillar's\ Value - Debt\ Value$ .

Hence, the equity value estimated for Caterpillar Inc. in the base scenario was \$45,999 million. Considering the number of shares outstanding on 2016 third quarter, the per share value of Caterpillar Inc. is \$78.91. If we compare the value obtained with the actual trading price, as of the 23<sup>rd</sup> of December 2016, per share of Caterpillar Inc., it can be noted that the value coming from the APV model is much lower than the current market price (\$94.34). On this way, the current trading price of Caterpillar Inc. shares seems to be overvalued, according to the developed DCF analysis. The detailed tables of each Part of the model can be found in Appendix A. Nevertheless, in the following section of this paper a sensitivity analysis to this base scenario will be performed.

### **c. Sensitivity Analysis on the APV Model**

In order to reinforce the forecasting valuation presented in the previous section of this paper and to estimate a ceiling and floor price limit for Caterpillar Inc.'s shares, the author performed a sensitivity analysis. It had the objective of reproducing some different scenarios, each considering a variation on a main value-determinant variable used to estimate the per share value of Caterpillar Inc. in the base case, under the APV model.

The first set of scenarios permitted to observe the effect of slight changes in the discount rate on Caterpillar's value per share computed in the base scenario. In this set of scenarios small variations were made to the discount rate (upwards and downwards), resulting in a value per share that remained within the range of \$69.19 and \$90.39. In the worst case (with the higher

discount rate value) it was considered a discount rate of 18.99% (increase of 1.00%) and in the best case the rate used was 16.99% (a 1.00% decrease of the rate). Moreover, it can be inferred that a 1.00% rise in the discount rate reduces the value for each Caterpillar share in 6.41%.

A second set of scenarios was drawn to assess the sensitivity of the target share price of Caterpillar Inc., computed in the base scenario, when facing percent variations in yearly sales and operating costs' growth rates. As in the previous scenario, those growth rates suffered 0.50% and 1.00% shifts (both on upward and downward directions). The upper value obtained in this scenario was \$88.40, for when the yearly growth rates of sales and operating costs were increased by 1.00%. On the other hand, the lower bound value per share of this scenario was \$70.02, resulting from an opposite direction shift. Thus, a 1.00% increase on the yearly growth rates of sales and operating costs, conducts to a 5.91% upward shift in Caterpillar's Inc. value per share. Below, in Table 4, it is possible to observe the range of values obtained to a share of Caterpillar Inc., considering each of the scenarios described previously:

	by Δ discount rate	by Δ growth rates
Value per Share	[\$69.19; \$90.39]	[\$70.0; \$88.40]
Change (+1%)	-6.41%	5.91%

Table 4

Summing up the observed scenarios, Caterpillar's per share value is within the range of \$69.19 and \$90.39, being those values the outcome of discount rate value shifts, since it is the variable that mostly affects the value per share of the company under this valuation approach. The value obtained in the multiples valuation (\$73.38) is within the previously referred range of per share values although it is below the Caterpillar's base scenario value per share, hence both valuation methods point to close values.

## **5. INVESTMENT RECOMMENDATION**

As previously referred, this chapter has the goal to advise investors on whether to buy, sell or hold Caterpillar Inc.'s stocks under the analysis made so far. Taking into consideration the

analysis performed to the firm's performance in the last few years and the possible near term business opportunities to be explored, as well as the evolution of the Construction and Farm Machinery Industry, and the two valuation methodologies used to assess Caterpillar Inc. target price, the author investment recommendation is to sell Caterpillar Inc.'s stock. Nevertheless, it is crucial to highlight that this is an analysis that considers the current market conditions and short term possible market swings, hence as the market environment changes investors should carefully analysed which information is or is not up to date. Below, the author aims to state the main reasons that justify his recommendation:

a) Caterpillar product set offering is the one with the highest quality and broadest in the market, also the firm has an amazing worldwide distribution network. However, it is predicted that many new competitors will enter in this market, harming its dominant position.

b) As Caterpillar has always been a fast mover in its industry there are several opportunities for an upcoming turnaround on its sales levels, namely: stabilization of commodities' prices; improvement of the firm's construction machinery performance in the enormous Chinese market; good effects on the firm's cost structure coming from the restructuring efforts; upcoming high levels of investment in construction in emerging markets.

c) The multiples valuation, even though it should not be analysed on its own indicated that Caterpillar market value is overvalued. The target price range, \$56.43 - \$87.92 (minimum value under the P/E multiple and the maximum under the P/Sales ratio) is lower than the market value range between 30<sup>th</sup> of September and 23<sup>rd</sup> of December of 2016, \$88.77 - \$94.34.

d) The base scenario of the APV model valuation is aligned with the multiples valuation outcome. The target value of \$78.91 is again below the current market price. Even if we rely on the sensitivity analysis performed, one can infer that the per share value range obtained (\$69.25 - \$90.50) shows that the stock market price might be overvalued.

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**APPENDIX**

**Appendix A – APV model tables**

Assumptions:			
Tax Rate (statutory tax rate)	35%	Debt Outstanding	37,110
Terminal Growth Rate	5%	Book value of Equity	15,645
CAPM Discount Rate (unlevered cost of capital)	17.99%	Cost of Debt	3.31%
Shares Outstanding (million)	585.07	Risk Free Rate	2.31%

Part 1 - Caterpillar Inc.'s Unlevered Value	12 Months Ended													
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Terminal Year
<b>Sales Revenues</b>	55,656	55,184	47,011	40,429	41,642	43,724	45,911	48,206	50,617	54,160	57,951	62,007	66,968	
%growth		-0.85%	-14.81%	-14.00%	3.00%	5.00%	5.00%	5.00%	5.00%	7.00%	7.00%	7.00%	8.00%	5.00%
<b>Operating Costs</b>	40,727	39,767	33,742	29,693	29,841	30,289	30,743	31,205	31,673	32,464	33,276	34,108	35,131	
%growth		-0.34%	-12.24%	-12.00%	0.50%	1.50%	1.50%	1.50%	1.50%	2.50%	2.50%	2.50%	3.00%	
<b>EBITDA</b>	14,929	15,417	13,269	10,737	11,801	13,435	15,167	17,002	18,944	21,695	24,675	27,899	31,837	
Depreciation and amortization	3,087	3,163	3,046	3,027	3,008	2,990	2,971	2,953	2,935	2,917	2,898	2,881	2,863	
%growth		2.46%	-3.70%	-0.62%	-0.62%	-0.62%	-0.62%	-0.62%	-0.62%	-0.62%	-0.62%	-0.62%	-0.62%	
<b>EBIT</b>	11,842	12,254	10,223	7,709	8,792	10,446	12,196	14,049	16,009	18,779	21,776	25,019	28,974	
Taxes (35%)	1,157	1,254	626	2,698	3,077	3,656	4,269	4,917	5,603	6,573	7,622	8,757	10,141	
<b>NOPLAT</b>	10,685	11,000	9,597	5,011	5,715	6,790	7,927	9,132	10,406	12,206	14,155	16,262	18,833	
Depreciation and amortization	3,087	3,163	3,046	3,027	3,008	2,990	2,971	2,953	2,935	2,917	2,898	2,881	2,863	
NWC	11,038	10,990	8,115	8,115	8,115	8,115	8,115	8,115	8,115	8,115	8,115	8,115	8,115	
Δ NWC	0	-48	-2,875	0	0	0	0	0	0	0	0	0	0	
CAPEX	-4,446	-3,379	-3,261	-3,695	-3,695	-3,695	-3,695	-3,695	-3,695	-3,695	-3,695	-3,695	-3,695	
<b>Free Cash Flow</b>	9,326	10,832	12,257	4,343	5,028	6,084	7,203	8,389	9,645	11,427	13,358	15,448	18,001	
<b>Discounted Free Cash Flow</b>				3,681	3,612	3,704	3,717	3,668	3,575	3,589	3,556	3,485	3,442	
Cumulated Discount Rate				0.848	0.718	0.609	0.516	0.437	0.371	0.314	0.266	0.226	0.191	0.191
<b>Terminal Value</b>														145,491
<b>PV of Terminal Value</b>														27,820
<b>Net Present Value</b>	63,848													

Part 2 - Caterpillar Inc.'s Tax Shields	
No-cost-of-leveraged	12,989
Damodaran	11,648

Part 3 - Caterpillar Inc.'s Expected Bankruptcy Costs	
Expected Bankruptcy Costs	20.69
Probability of Bankruptcy	0.082%
% of Firm Value included in the bankruptcy costs	30.00%
Firm Value included in the bankruptcy costs	25,233.78

Part 4 - Caterpillar Inc.'s Value	
Value of Operating Assets wo/ leverage cost	76,836
Marketable Securities Value	0
Cash	6,460
<b>Value of the Firm</b>	<b>83,276</b>
<b>Value of Equity</b>	<b>46,166</b>
<b>Value per Share</b>	<b>78.91</b>