

## A Du Pont Analysis of the 20 Most Profitable Companies in the World

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**Abstract**— The present paper aims to demonstrate that in most cases the most profitable companies are not the most attractive for investors – through Du Pont Analysis method. In order to do this, we take into account the top 20 most profitable companies in the world in 2009 (according to Fortune). By using Du Pont analysis we came to the results that the ranking is not preserved when indicators (ratios) such as ROA (return on assets), ROE (return on equity) or ROS (return on sales) are taken into consideration.

**Keywords**- profit, ROS, ROA, ROE, Du Pont analysis

### I. INTRODUCTION

For an investment to be acceptable to a firm's financial management it must provide a positive answer to the question "Will the acquisition of this asset increase the value of the owner's equity?" [1]

The financial objectives of a for-profit business primarily concern the needs of the external suppliers of debt and equity capital. The economic returns to shareholders comprise dividends and capital gains on the market value of their shares. As earnings determine what can be paid out as dividend in the long run, shareholders are primarily concerned with financial measures like earnings, ROA, ROE [2].

The three measures that we discuss in this paper are probably the best known and have the widest use of all financial ratios. In one form or another they are intended to measure how efficiently the firm uses its assets and how efficiently the firm manages its operations. The focus in this group is on the bottom line – the net income [3].

### II. DU PONT ANALYSIS – THE LINK BETWEEN ROS, ROA AND ROE

Du Pont analysis, a common form of financial statement analysis, decomposes return on net operating assets into two multiplicative components: profit margin and asset turnover (7). These two accounting ratios measure different constructs and, accordingly, have different properties. Prior research

has found that a change in asset turnover is positively related to future changes in earnings [4].

Du Pont analysis takes into account three indicators to measure firm profitability: ROS, ROA, and ROE.

**Return on Sales** (Net Profit Margin Ratio) – **ROS** (1) – measures how profitable a firm's sales are after all expenses, including taxes and interest, have been deducted [5].

**Return on assets** – **ROA** (2) – offers a different take on management effectiveness and reveals how much profit a company earns for every dollar of its assets [6]. Assets include things like cash in the bank, accounts receivable, property, equipment, inventory and furniture. Only a few professional money managers will consider stocks with a ROA of less than 5%.

Of all the fundamental ratios that investors look at, one of the most important is **return on equity** – **ROE** (3). It is a basic test of how effectively a company's management uses investors' money – ROE shows whether management is growing the company's value at an acceptable rate. Also, it measures the rate of return that the firm earns on stockholder's equity. Because only the stockholder's equity appears in the denominator, the ratio is influenced directly by the amount of debt a firm is using to finance assets [7]. Practically, ROE reflects the profitability of the firm by measuring the investors' return [8].

ROE is calculated by taking the profit after tax and preference dividends of a given year and dividing it by the book value of equity (ordinary shares) at the beginning of the year (4). Average equity can also be used. Equity would consist of issued ordinary share capital plus the share premium and reserves [9]. Many professional investors look for a ROE of at least 15%.

Because they both measure a kind of return at first glance these two metrics seem pretty similar. Both gauge a company's ability to generate earnings from its investments. But they don't exactly represent the same thing. A closer look at these two ratios reveals some key differences. Together, however, they provide a clearer

representation of a company's performance. Here we look at each ratio and what separates them [10].

$$\text{ROS} = \frac{\text{Sales}}{\text{Total Assets}} \quad (1)$$

$$\text{ROA} = \frac{\text{Net income}}{\text{Total Assets}} \quad (2)$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Stockholder's equity}} \quad (3)$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Total Asstes}} \times \frac{\text{Total Assets}}{\text{Stockholder's equity}} \quad (4)$$

$$\frac{\text{Total Assets}}{\text{Stockholder's equity}} = \text{Equity multiplier} \quad (5)$$

$$\text{ROA} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \quad (6)$$

$$\frac{\text{Sales}}{\text{Total Assets}} = \text{Total assets turnover} \quad (7)$$

So,

$$\text{ROE} = \text{ROA} \times \text{Equity multiplier} \quad (8)$$

$$= \text{ROA} \times (1 + \text{Debt-equity ratio})$$

If a company takes on financial leverage, ROE would rise above ROA (6). The balance sheet equation – if expressed differently – can help us see the reason for this: the shareholders' equity = assets – liabilities. By taking on debt, a company increases its assets thanks to the cash that comes in. But since equity equals assets minus total debt, a company decreases its equity by increasing debt. In other words, when debt increases, equity shrinks, and since equity is the ROE's denominator, ROE, in return, gets a boost. At the same time, when a company takes on debt the total assets – the denominator of ROA – increases. Therefore debt amplifies ROE in relation to ROA [11].

Or,

$$\text{ROE} = \text{ROS} \times \text{Total assets turnover} \times \text{Equity multiplier} \quad (9)$$

In order for ROE to increase ROA and ROS should be higher because under these circumstances there is a direct relationship between the three ratios taken into consideration.

### III. DATA AND RESULTS

This paper is trying to prove that in most cases the most profitable companies are not the most attractive for investors. To prove this hypothesis we consider the top 20 most

profitable companies in the world recorded in 2009 in absolute form, according to Fortune [12].

To achieve the Du Pont analysis and to demonstrate this hypothesis we calculated for each of the 20 companies profitability ratios such as: ROS, ROA and ROE.

The results are shown in the table below (Table 1):

TABLE I. TOP 20 MOST PROFITABLE COMPANIES IN THE WORLD (2009)

Company (Ranking)	Net income (mil \$)	ROA (%)	ROE (%)	ROS (%)
1 Gazprom	24,555.70	8.90	13.97	25.99
2 Exxon Mobil	19,280.00	8.26	17.44	6.77
3 Industrial & Commercial Bank of China	18,832.20	1.09	19.08	27.18
4 BP	16,578.00	7.04	16.31	67.35
5 China Construction Bank	15,627.90	1.11	19.21	26.78
6 Petrobras	15,504.00	7.74	16.48	16.88
7 Barclays	14,648.30	0.66	19.18	22.02
8 Microsoft	14,569.00	18.71	36.83	24.93
9 Wal-Mart Stores	14,335.00	8.40	20.26	3.51
10 Vodafone	13,782.30	5.79	10.05	19.44
11 Procter & Gamble	13,436.00	9.96	21.29	16.86
12 International Business Machines	13,425.00	12.31	59.31	14.02
13 Goldman Sachs Group	13,385.00	1.58	18.93	25.90
14 Merck	12,901.30	11.51	21.84	47.04
15 AT&T	12,535.00	4.66	12.30	10.19
16 Royal Dutch Shell	12,518.00	4.28	9.18	4.39
17 Banco Santander	12,430.30	0.78	12.06	11.69
18 Wells Fargo	12,275.00	0.99	10.98	12.44
19 Johnson & Johnson	12,266.00	12.95	24.25	19.82
20 Bank of China	11,867.50	0.93	15.85	23.89

The three ratios analyzed reconfigure the ranking with higher profits; none of the companies keep their place in the standings initially held. On the contrary the deviations are relatively high.

TABLE II. COMPANIES RANKING AFTER ROS, ROA AND ROE

Ranking after ROS	Ranking after ROA	Ranking after ROE
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BP	Microsoft	International
Merck	Johnson & Johnson	Business
Industrial	International	Machines
&Commercial	Business	Microsoft
Bank of China	Machines	Johnson & Johnson
China	Merck	Merck
Construction Bank	Procter & Gamble	Procter & Gamble
Gazprom	Gazprom	Wal-Mart Stores
Goldman Sachs	Wal-Mart Stores	China
Group	Exxon Mobil	Construction Bank
Microsoft	Petrobras	Barclays
Bank of China	BP	Industrial
Barclays	Vodafone	&Commercial
Johnson & Johnson	AT&T	Bank of China
Vodafone	Royal Dutch Shell	Goldman Sachs
Petrobras	Goldman Sachs	Group
Procter & Gamble	Group	Exxon Mobil
International	China	Petrobras
Business	Construction Bank	BP
Machines	Industrial	Bank of China
Wells Fargo	&Commercial	Gazprom
Banco Santander	Bank of China	AT&T
AT&T	Wells Fargo	Banco Santander
Exxon Mobil	Bank of China	Wells Fargo
Royal Dutch Shell	Banco Santander	Vodafone
Wal-Mart Stores	Barclays	Royal Dutch Shell

Correl ROE with ROS = 0.025049205

Correl ROE with ROA = 0.585073099

Analyzing the correlation between the net income and ROS, ROA and ROE it results that a high level of profit doesn't lead to high levels of profitability ratios. Correlations are very weak, which confirms our hypothesis according to which firms with high profits don't have in general high ratios of profitability, because they have high values both at the denominator (the total assets, the stockholder's equity and the sales) and at the numerator.

For these reasons companies with a low level of profit often have higher profitability ratios.

Also notice that between ROA and ROS there is the strongest correlation (0.585073099), which was expected taking into consideration equation (8) where ROE is influenced by ROA on one hand and equity multiplier (5) on the other hand.

In terms of ranking by ROA only the first 11 companies starting with Microsoft and ending with Vodafone have a ROA higher than 5%, a minimum acceptable rate.

In terms of ranking by ROE 14 companies achieved values above 15%. Gazprom, the company with the highest profit in the world in 2009, is not placed in the top 14.

Under these circumstances we can say that this is not an attractive business for investors. It is remarkable that the first two positions in the ranking by ROE are taken by IBM and Microsoft with high rates (59.31% for IBM and 36.83% for Microsoft).

To identify the relationship between the net income, ROS, ROA and ROE the correlation coefficient CORREL (10) has been calculated. As the value approaches 1 the connection is very strong; as the value approaches 0 it is the weakest link.

**The correlation coefficient – CORREL:**

$$c_{y/x} = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2] * [n\sum y^2 - (\sum y)^2]}} = \quad (10)$$

Where,

n – number of the elements/index/variable  
x, y – elements/indexes/variables to be considered  
(in our case Net income, ROS, ROA, ROE)

The results are given below:

TABLE III. CORRELATION BETWEEN THE FOUR VARIABLES (RATIOS)

Correl Net Income with ROS	= 0.187073253
Correl Net Income with ROA	= 0.086352418
Correl Net Income with ROE	= -0.07655603
Correl ROA with ROS	= 0.096585362

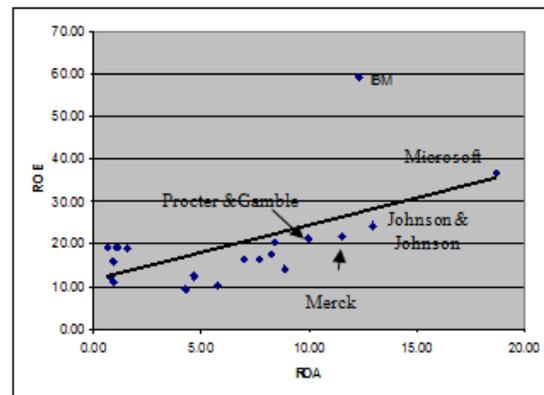


Figure 1. Correlation between ROA and ROE (ROE is a function of ROA)

A strong correlation between ROA and ROE is also revealed by the fact that the first five positions in the top 20 companies – based on ROA and ROE – are occupied by the same companies (Microsoft, IBM, Johnson & Johnson, Merck, and Procter & Gamble – Fig. 1).

#### IV. CONCLUSIONS

The company profitability for most investors is a landmark in terms of earnings they could obtain by placing capital. Profits earned by a company, taken the absolute amount, provides an overview of a company's activity without giving details about the extent to which the company manages dividends, debts, liabilities or other indicators.

In this paper we are trying to demonstrate with the help of profitability ratios like ROS, ROA, ROE that the companies' profits are not relevant to investors except to the extent that they relate to other indicators to identify a relation between effect and effort (effect is profit while effort is given by either sales, total assets, or the stockholder's equity).

A conclusive example for the ROE importance is the comparative analysis between Gazprom and IBM. Gazprom is the company with the highest profit in 2009 (24,555.70 mil. \$). IBM is the company with the highest ROE of all the companies that we analyzed (a net income of 13,425 mil. \$). Gazprom has a profit of 82% higher than IBM, but a ROE of 4.24 times smaller than IBM (13.97% compared to IBM's 59.31%).

As a conclusion, the Du Pont analysis that we made (by calculating ROS, ROA and ROE) for the top 20 most profitable companies in the world emphasize that absolute measurements are not relevant every time. Therefore to have a common basis of comparison between several companies and to compose ranks the relative sizes for measuring efficiency are necessary when calculating the ratio between effect and effort.

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