

# Why You Should Add Back Accumulated Depreciation But Most Wall Street Analysts Don't



*"Extraordinary claims require extraordinary evidence"*  
Carl Sagan



FSA Valuation Service Inc.

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## Table of Contents

Stating the Obvious and Our Extraordinary Claim

ROA Formula

Five Reasons Wall Street Has Been Using a Flawed ROA Metric

Example: Funding an Uber Driver

Summary

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## Stating the Obvious

The total amount of capital invested is important in calculating the return on capital

## Our Extraordinary Claim

Wall Street analysts do not use the total amount of capital invested to calculate return on capital



*"Extraordinary claims require extraordinary evidence"*

*Carl Sagan*

In honour of Carl Sagan, here is our evidence...

# Why You Should Add Back Accumulated Depreciation But Most Wall Street Analysts Don't!

Investors know the original amount of money you invest matters. Whether you invest \$100 or \$1 billion you want a return on that money. And of course the only way to know your return is to know the original amount of money you invested in first place!

It is so obvious that you maybe wondering why we are even talking about it? Believe it or not, when it comes to stock investment analysis 99% of Wall Street investors get this wrong and they do not even realize it.

Have a closer look at the ROA formula:

Traditional ROA formula:  $ROA = \frac{\text{Net Income}}{\text{Net Assets}}$

Net Assets is **NOT** the total amount of capital originally invested

At FSA we adjust the ROA formula as follows<sup>1</sup>:  $ROA = \frac{\text{Net Income}}{\text{Net Assets} + \text{Accumulated Depreciation}} = \frac{\text{Net Income}}{\text{Gross Assets}}$

We add back Accumulated Depreciation to use the total amount of capital originally invested

1) FSA's CFIRR metric makes several other adjustments but for the scope of this document we are focusing on adding back accumulated depreciation adjustment

# Why You Should Add Back Accumulated Depreciation But Most Wall Street Analysts Don't!

## Five Reasons Wall Street Has Been Using a Flawed ROA Metric

### 1) Wall Street's relentless pursuit of under valued stocks

Rightfully so analysts on Wall Street are obsessed with the VALUE of stocks. It is thought that if you are armed with superior knowledge of the value of a stock you can make excess gains when the market eventually wakes up to your view as long as you got there earlier! So Wall Street analysts are constantly on the hunt for undervalued stocks.

*"Price is what you pay, value is what you get!"*  
Warren Buffet

Naturally, when analysts are looking for undervalued stocks they are going to look at the Net Assets since that is an estimate by the accountants of the value of the assets in the company. That's perfectly alright and correct when assessing the value of a stock. We agree with using Net Assets when assessing the value of a firm.

However, this obsession with value has lead analyst to use Net Assets as a basis for ALL analysis regardless of context. When assessing the company's ability to generate a return on capital, Net Assets is simply the wrong number to use. You need to use the original amount of capital or Gross Assets contributed by capital providers not the net number. As we said, investors know you need to use the original investment but tacitly or unwittingly do not use the original investment when using an ROA. Since ROA uses Net Assets, not Gross Assets it is a flawed measure in assessing the company's ability to generate a return on capital.

Wall Street's pursuit of under valued stocks



# Why You Should Add Back Accumulated Depreciation But Most Wall Street Analysts Don't!

## Five Reasons Wall Street Has Been Using a Flawed ROA Metric

### 2) Legacy and tradition have created deeply ingrained common practices

Donaldson Brown, a salesman at DuPont developed the now famed DuPont analysis in 1912. By 1920, DuPont executives and analysts started using the analysis for internal analysis. This was a simple yet brilliant analysis aimed at identifying the drivers of returns generated by the company.

The following two formulas are the basis of the DuPont analysis:

$$\text{ROA} = \frac{\text{Net Income}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average Total Assets}} = \frac{\text{Net income}}{\text{Average Total Assets}}$$

$$\text{ROE} = \frac{\text{Net Income}}{\text{Average Total Equity}} = \frac{\text{Net Income}}{\text{Pretax Income}} \times \frac{\text{Pretax Income}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average Total Assets}} \times \frac{\text{Average Total Assets}}{\text{Average Total Equity}}$$

It's more than a formula, it's a break down of what is driving return on capital. It's all about the sales, margins and turns, and trying to figure out which part is key to driving ROA in any particular business.

This was developed back in 1912! Accounting systems and standards were just getting established. I doubt they even had access to the Gross Assets figure, if it was tracked at all. Even today, we had trouble finding a data provider who provides the Gross Assets figure. <sup>1, 2</sup>

In its day, the DuPont analysis was brilliant and quickly adopted. The elegance and usefulness of the DuPont analysis has lead analysts to use it without questioning it, and without seeing it's main flaw, namely using Net Assets and not Gross Assets. Once this legacy was established it became common practice.

See "Perpetuation of the established system" later in this presentation.



Donaldson Brown

1) FSA's subscribes to Morningstar which provides Gross Assets  
2) Yahoo Finance provides Gross Assets

# Why You Should Add Back Accumulated Depreciation But Most Wall Street Analysts Don't!

## Five Reasons Wall Street Has Been Using a Flawed ROA Metric

### 3) Sunk cost vs. post mortem analysis

Analysts often are not asking right question in first place. A common mistake we encounter with analysts is confusion over sunk costs vs. post mortem analysis. As discussed, Wall Street has rightfully obsessed over valuation, which immediately triggers analysts to examine the Net Assets. Analysts often point out that they do not care how much money was spent previously on a project (or in the entire company) because it is “sunk cost.” They say they only care about the return going forward so they want to use the Net Assets or the value of the company today.

Net Assets is indeed the correct number to use to VALUE the existing assets but entirely the wrong number to use when conducting post mortem analysis and judging the ECONOMICS of the business as a whole. The day you enter the stock is NOT relevant to the economics of the business, the economics of the business was established before you entered the stock.

Whether a company mines commodities, develops software, manufactures widgets, provides goods and services or whatever they do, the economics is a function of the Gross investment not the Net investment.

On a go forward basis the NEXT dollar of investment will be a Gross Investment basis, and likely to face similar economics to past investments the company made. Furthermore, investing in a stock is an investment in all the future cash flows which will include many future projects that will be a function of the Gross Investment going forward as well. Therefore, the future rate of return should be estimated by comparing similar investments made in the past on a Gross Investment basis.

Do not confuse sunk cost valuation analysis with the post mortem economic returns generated by the business.

	Net Assets	Gross Assets
Sunk cost	✓	✗
Value of Existing Assets	✓	✗
Post-mortem analysis	✗	✓
Company economics	✗	✓
Future investments	✗	✓
Discounted Future Cash Flow	✗	✓

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## Five Reasons Wall Street Has Been Using a Flawed ROA Metric

### 4) Accounting standards focus on value of existing assets and tax reporting, not on investment analysis

The above statement in and of itself warrants considerable study and explanation but with respect to adding back accumulation, let's focus on the balance sheet, specifically the Net Assets vs. Gross Assets

Net Assets = Gross Assets – Accumulated Depreciation

The Financial Accounting Standards Board (FASB) who govern GAAP, and the International Accounting Standard Board (IASB) who govern IFRS have always put greater emphasis on the accuracy of Net Assets over Gross Assets. The emphasis on Net Assets stems from the desire to get the most accurate VALUE of existing assets at the time of striking the balance sheet. In the eyes of the accounting boards, Gross Assets are not as relevant as Net Assets because the Gross numbers deal with the past and have no bearing on the VALUE of the company's assets as they stand today. Although no error is good, the accounting boards deem an error in Gross Assets more acceptable than an error in the Net Assets.

In fact, when accounting for acquisitions neither GAAP nor IFRS require the accounting statements to carry forward the Gross Assets of the acquired company in the merged entity. The Gross Assets of the acquired company are simply dropped from the combined entity because they say it is not important. We disagree but that is a topic for another day.

Interestingly, when we founded FSA we knew Gross Assets was going to be an important number and we had trouble finding a data provider that reported the Gross Assets since it was deemed as unimportant. Fortunately our data provider, Morningstar provides the Gross Assets data.



- 1) FSA's subscribes to Morningstar which provides Gross Assets
- 2) Yahoo Finance provides Gross Assets

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## Five Reasons Wall Street Has Been Using a Flawed ROA Metric

### 5) Perpetuation of the established system

The established system has yet to fully recognize the flaw in using Net Assets in ROE and ROA calculations. The standard ROE and ROA calculations are still taught in business schools, the CFA Institute and in the media. Naturally if this is being taught by the top institutions and repeated in the media, it gets adopted and perpetuated by analysts in the system.

#### Goldman Sachs explains the 'return on equity' formula that every CFA test taker must know

<https://www.businessinsider.com.au/cfa-dupont-roe-model-2015-4>

#### Financial Ratio Analysis | Harvard Business Publishing Education

<https://hbsp.harvard.edu/product/85K031-PDF-ENG>

#### Dupont Analysis Explained - YouTube

<https://www.youtube.com/watch?v=hHultcTJJcs>

#### CFA Level I FRA - DuPont Analysis - YouTube

<https://www.youtube.com/watch?v=Neb9sCUx5o0>

#### Experts call for wider adoption of Dupont financial analysis by corporates

<https://www.ft.lk/Front-Page/experts-call-for-wider-adoption-of-dupont-financial-analysis-by-corporates/44-533387>

#### Dupont Analysis: Everything a Stock Investor Should Know

<https://groww.in/blog/dupont-analysis-everything-a-stock-investor-should-know>

#### The Financial Cockpit: Three Levers and One Flight Plan (English version) | Ivey Publishing

<https://www.iveypublishing.ca/s/product/the-financial-cockpit-three-levers-and-one-flight-plan/01t5c00000Cwgah>



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## Example: Funding an Uber Driver

Let's follow the numbers of funding and Uber driver. Suppose your friend, Jim was a little short on cash and he wanted to start an Uber driving business but he didn't have the capital to buy a car to fund the business. Jim did some research and found out a new car would cost \$50,000 and would last about 6 years. Jim said he estimated in one year he could take in about \$80,000 in fares net of gas and maintenance. Jim said he would accept a fixed salary of \$65,000 and any excess cash flow would go to you the investor. Therefore, in Jim's estimation the investor would make about \$15,000 for 6 years on their \$50,000 investment. What would the ROA look like for this company over the next 6 years?

<b>Balance Sheet</b>	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Gross Investment	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Depreciation Expense		\$8,333	\$8,333	\$8,333	\$8,333	\$8,333	\$8,333
Accumulated Depreciation		\$8,333	\$16,667	\$25,000	\$33,333	\$41,667	\$50,000
Net Investment		\$41,667	\$33,333	\$25,000	\$16,667	\$8,333	\$0

<b>Income Statement</b>	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Revenue (net of gas and maintenance)	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000
Jim's Salary	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000
Cash Flow	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000

ROA (Traditional using Net Assets)	36%	45%	60%	90%	180%	#DIV/0!
ROA (adding back accum depn using Gross Assets)	30%	30%	30%	30%	30%	30%

ROA (Traditional) shows the investment improving over time, when in fact economics have not changed, the car is simply depreciating, artificially improving the ROA.

<sup>1)</sup> ROA (adding back acc depn) shows the investment is exactly the same regardless of depreciation which more accurately reflects the true economics of the Uber driving business.

The purpose of a performance measurement is to accurately estimate the true economics of the business from the financial statements. In this case we KNOW the economics of the business is \$15,000 on an investment of \$50,000 ( $\$15,000/\$50,000=30\%$ <sup>1)</sup> However, when we examine what the financial statements and the associated ROA to compare it to the true economics we see they DO NOT MATCH! By simply adding back the accumulated depreciation, the adjusted ROA matches the true economics of the business.

1) We are attempting to isolate the effects of adding back accumulated depreciation only. Therefore, we have not accounted for Asset Life which would actually yield an IRR of 20% (i.e. \$50,000 yielding \$15,000 for 6 years = 20% IRR which is the true economics of this business). FSA's CFIRR performance metric does adjust for asset life but is not in the scope of this document.

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## Summary

We made an extraordinary claim that Wall Street has been using a flawed ROA metric for over a century. The ROA metric which includes the accumulated depreciation distorts the true return on capital and economics of the business because it does not use the original amount money invested in the business. Investors recognize that the original amount of invested capital is important to know when trying to understand the return on capital, but when using an ROA they tacitly or unwittingly do not use the original amount of invested capital in calculating the return.

Long standing legacies and traditions established as far back as the 1920's by firms such as DuPont, while brilliant in their day, are flawed and can easily be improved upon. Analysts sometimes ask the wrong question and confuse sunk costs with post mortem analysis. While sunk cost is a meaningful concept it must be used in the right context and should not be applied to calculating the economics of business.

Accounting boards such as the Financial Accounting Standards Board (FASB) who govern GAAP, and the International Accounting Standard Board (IASB) who govern IFRS, set standards for financial statements for the purposes of valuing existing assets and for tax reporting purposes, not for stock market investors.

The standard and flawed ROE and ROA calculations are still taught in business schools, the CFA Institute and in the media, allowing the perpetuation of this flawed metric to persist.

We used a simple example of funding an Uber driver to demonstrate how an ROA is a flawed and distorted metric that can be easily fixed by adding back the accumulated depreciation to the Net Assets.

We hope we have put forward enough extraordinary evidence to validate our extraordinary claim that Wall Street has been using a flawed metric for over a century.



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*Contact FSA Valuation Service Inc. and find out how our data platform can help you find opportunities in the stock market.*

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# Other Accounting Distortions of Performance Metrics and Valuation

## Performance Measurement

	CFIRR	ROA	ROIC	ROE
Uses Cash Flow from Ops	✓	✗	✗	✗
Removes Leverage Distortion	✓	✓	✓	✗
Accounts for Asset Life	✓	✗	✗	✗
Removes Share Buyback Distortion	✓	Mitigated	Mitigated	✗
Preserves the Value of Original Capital Investment	✓	✗	✗	✗
Adjusts for Working capital vs. Deployed Capital	✓	✗	✗	✗
Removes Inflation Distortion	✓	✗	✗	✗

## Valuation

	Value Added	DCF	EV/EBITDA	P/E
Accounts for Balance Sheet Value	✓	✗	✗	✗
Correlates with Market Values	✓	✓	✓	✗
Shows Relationship Between Growth and Consistency	✓	✓	✗	✗
Avoids Terminal Values	✓	✗	✓	✓
Shows the Affects of Cost of Capital	✓	✓	✗	✗
Can Value a Company with Low or Negative Earnings	✓	✓	✗	✗
Can Value a Company on Standalone Basis without Peer Comparisons	✓	✓	✗	✗
Shows Value Generated Year by Year	✓	✗	✗	✗

Contact FSA Valuation Service Inc. and find out how our data platform can help you find opportunities in the stock market.

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