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Pitfalls of Relying on P/E Ratios & Problems With ROE

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Important Disclosure Information is contained on the last page of this report. The recipient of this report is directed to read these disclosures.

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1. P/E Ratio – obvious flaws
 - Hi/Lo Fallacy
2. ROE Problems
3. Examples
4. How do you protect yourself?
5. Get better research – for free

P/E ratio = price/earnings per share:

- Calculation:
 - If price of stock is \$20 per share and EPS are \$2 per share, then the P/E ratio is 10.
- How to use:
 - To determine value and relative value.
 - For example:
 1. If an investor thinks a stock should be equal to 20 times earnings, then a stock with EPS of \$2 should trade at \$40 per share.
 2. Stocks with the higher P/E ratios are considered more expensive than stocks with lower P/E ratios.

*This graph was created based on information collected and analyzed by New Constructs, LLC. New Constructs regularly gathers information from over 3,000 companies' 10Ks, including the Notes to the Financial Statements and MD&A.

THE P/E RATIO - PITFALLS

Structural Issues

Blind spots for P/E ratios:

- Ignore risk
- Ignore the time value of money
- Ignore leverage
- Ignore capex

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Blind spots for P/E ratios: **Reliance on reported EPS**

1. [CFO's admit to earnings manipulation](#)
 - Featured on [MarketWatch.com](#)
2. The earnings denominator of the P/E ratio is subject to accounting rules that are constantly being reshaped. Former Financial Accounting Standards Board (FASB) chairman [Bob Herz](#):
"I'm not a big fan of earnings multiples, of P/E multiples and things like that. We have made over time dramatic changes in the accounting that affect the denominator of the P/E ratio, but it's not clear whether and how that flows through the valuations."

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THE P/E RATIO - PITFALLS

Short Cuts Don't Always Work

P/E ratios are a short cut that has risks.

		ROIC			
		5%	10%	15%	20%
Earnings Growth	5%	4.1	10.0	12.0	12.9
	10%	(7.3)	10.0	15.8	18.6
	15%	(29.8)	10.0	23.3	29.9
	20%	(74.5)	10.0	38.2	52.2
	35%	(661.5)	10.0	233.8	345.8

Assumptions: WACC is 10% and 20yr forecast horizon.

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THE P/E RATIO - PITFALLS

Hi/Lo Fallacy – Tricks to make any M&A look good

P/E ratios can be manipulated to show EPS growth.

- Whenever a company buys a lower P/E company, combined EPS go up - no matter the economics.
- When company buys a higher company, combined EPS go down.
- More details:
 - [Spreadsheet](#) that shows how the math works
 - [Webinar](#) walking thru the spreadsheet

	High	Low	Get EPS Up! High buys Low	Get P/E Up! Low buys High
Earnings	\$5,000	\$5,000	\$10,000	\$10,000
Shares	5,000	5,000	8,333	12,500
Stock price	\$30	\$20	\$30	\$20
EPS	\$1.00	\$1.00	\$1.20	\$0.80
P/E	30X	20X	25X	25X

Note: Adapted from *The Quest for Value*, G. Bennett Stewart, HarperCollins, 1991.

Source for chart is Credit Suisse First Boston, *Frontiers of Finance*, "[Let's Make a Deal](#)", Michael Mauboussin, page 7

Part II

The Problems with ROE

The Problems With ROE

Structural Issues

Many of the same structural flaws as P/E ratios:

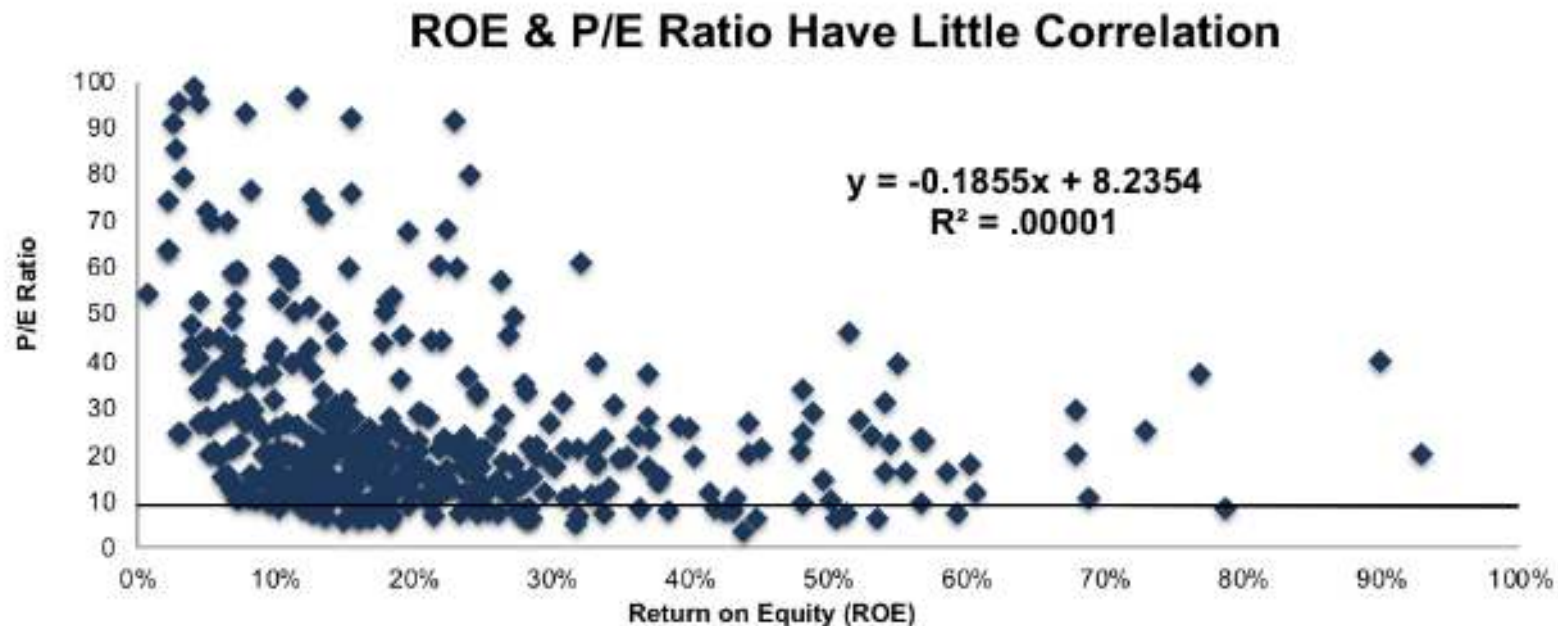
- Based on accounting earnings
- Ignores leverage
- Ignores hidden liabilities
- Potential for executive manipulation

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Problems with ROE

Short Cuts Don't Always Work

- For ROE and P/E to be useful, they should have some correlation (i.e. higher ROE companies should earn higher P/Es).
- S&P 500 shows no correlation between ROE and P/E

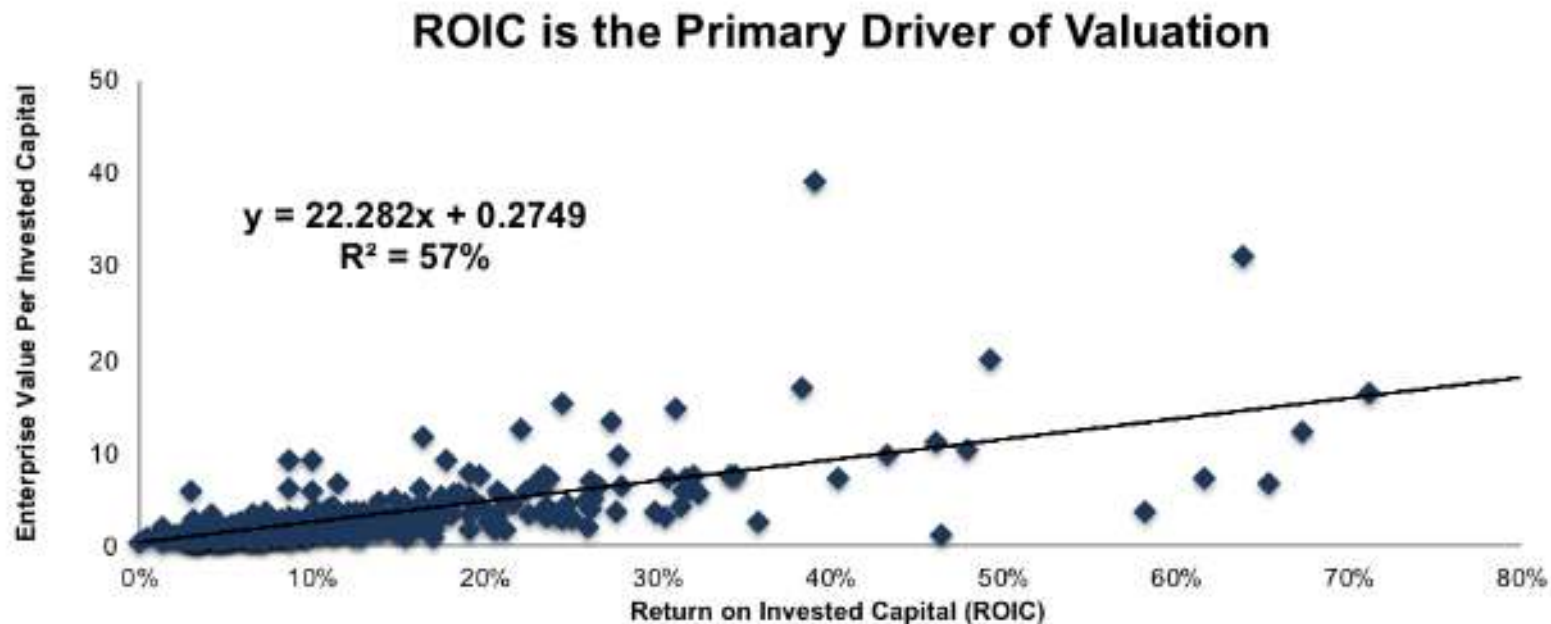


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Problems with ROE

Diligence Pays

- Instead of ROE, investors should use ROIC
- Benefits of ROIC
 - Reverses accounting distortions
 - Accounts for leverage
 - Tangible link to Valuation



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Part III

Examples Where P/Es and ROE Lead You Astray

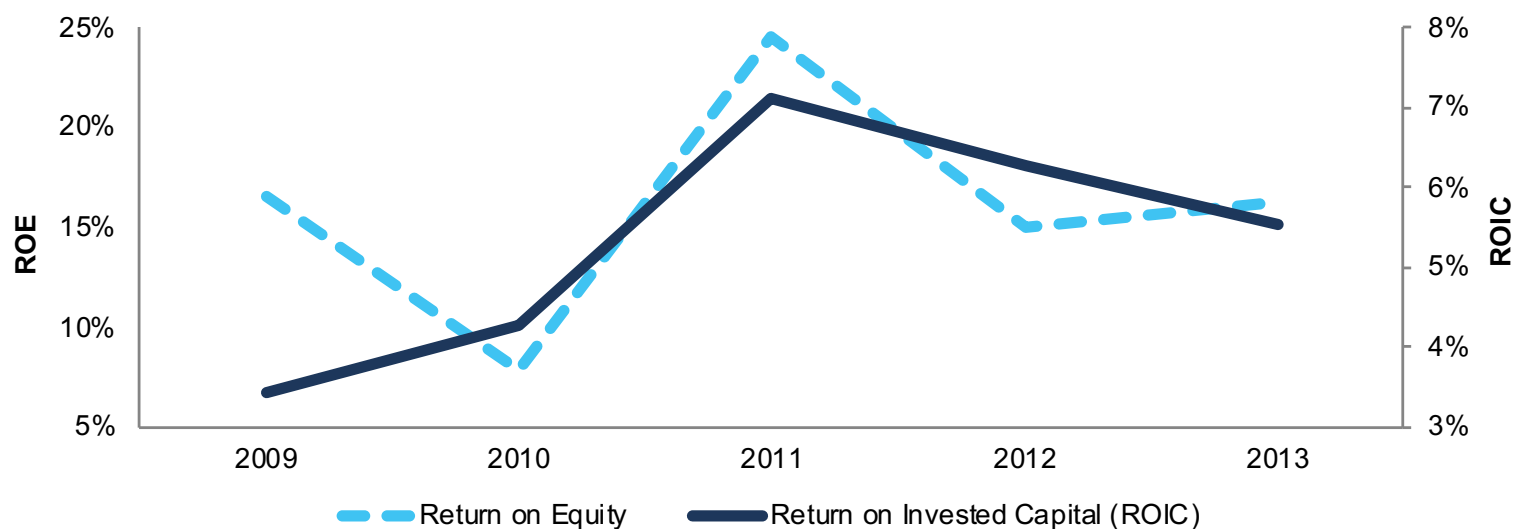
SEE THE DIFFERENCE: PROTECT YOUR PORTFOLIO

ROE Going Up, ROIC Going Down

Olin Corporation (OLN)

- ROE increased from 15% to 16% in 2013 even as ROIC continued to fall
- Low P/E of 13 based on “misleading” accounting earnings
- Valuation implied 35 years of 5.5% NOPAT growth

Falling ROIC and Rising ROE



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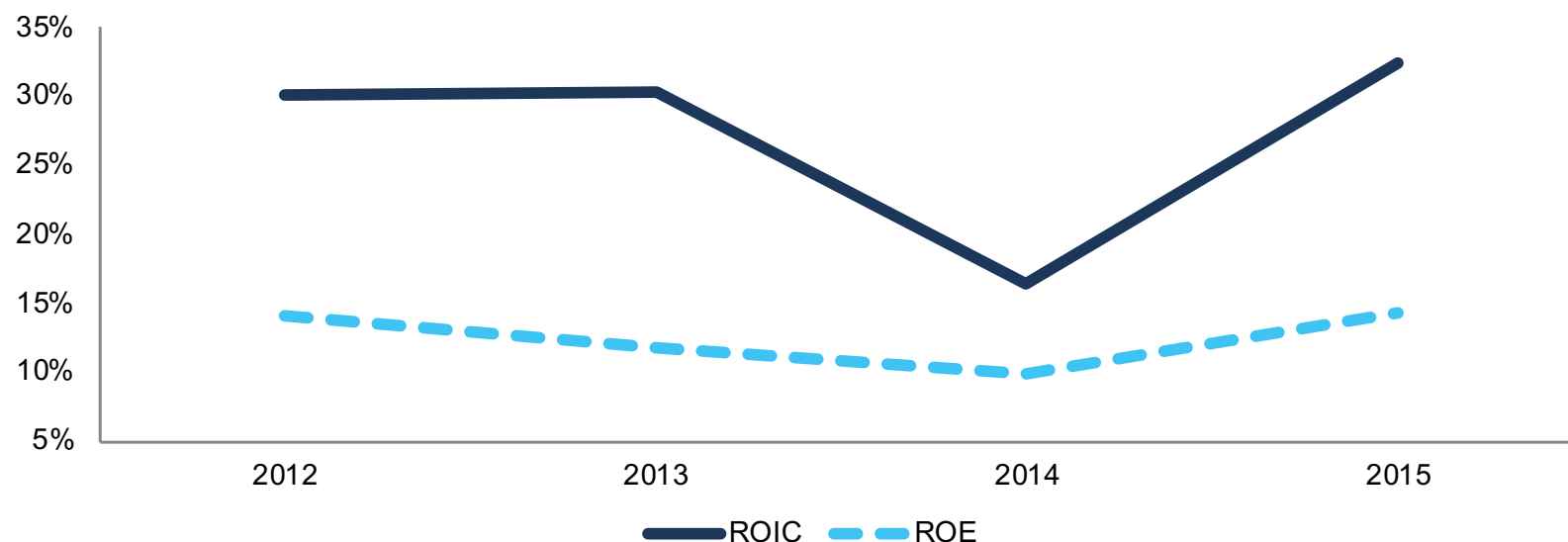
SEE THE DIFFERENCE: BOOST YOUR PORTFOLIO

ROIC Rising Faster than ROE

NVIDIA (NVDA)

- ROE of 14% compared to ROIC of 32%
- P/E of 24, above the S&P 500 average of 22
- Valuation implied no more than 10% profit growth into perpetuity

ROE Understates ROIC



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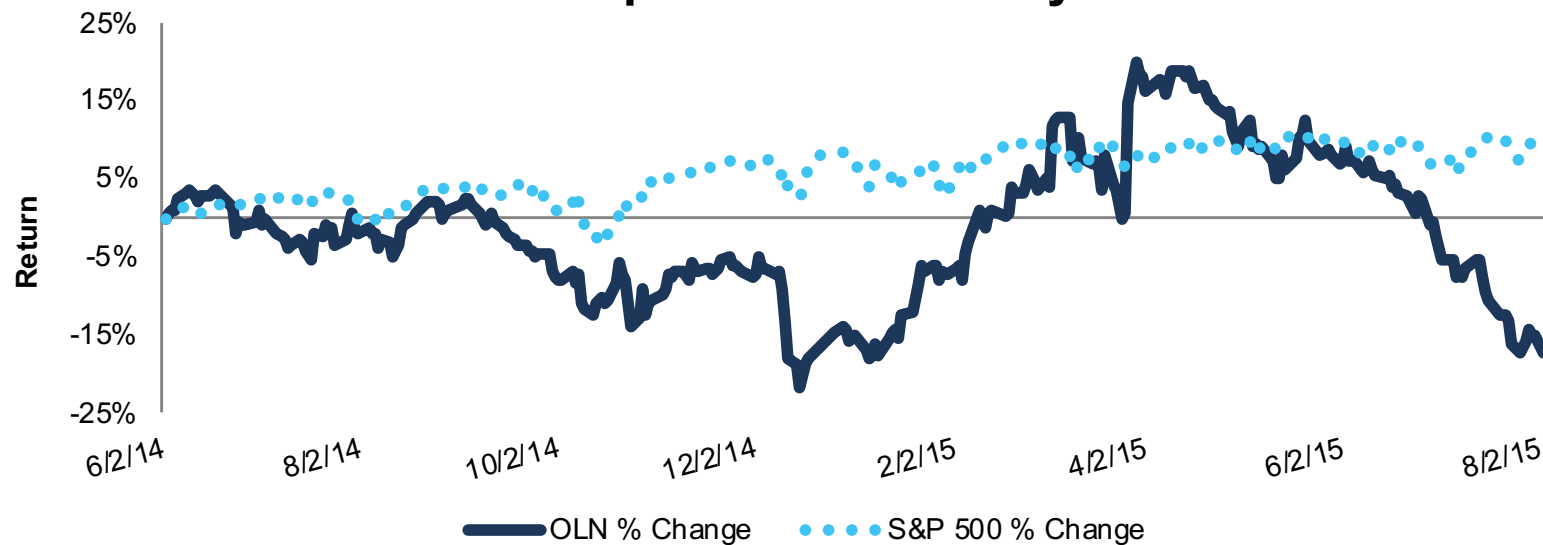
ECONOMICS DRIVE PERFORMANCE

Warned on 6/2/2014: Olin Corporation (OLN)

Accounting Loopholes Mislead” Investors

1. \$50 million (17% of reported operating income) in non-operating income due to one-time items, changes in reserves, and pension gains
2. Upgraded to Neutral on 8/5/15, down 17% vs. S&P 500 up 9% during holding period.

OLN Underperformed SPY by 26%



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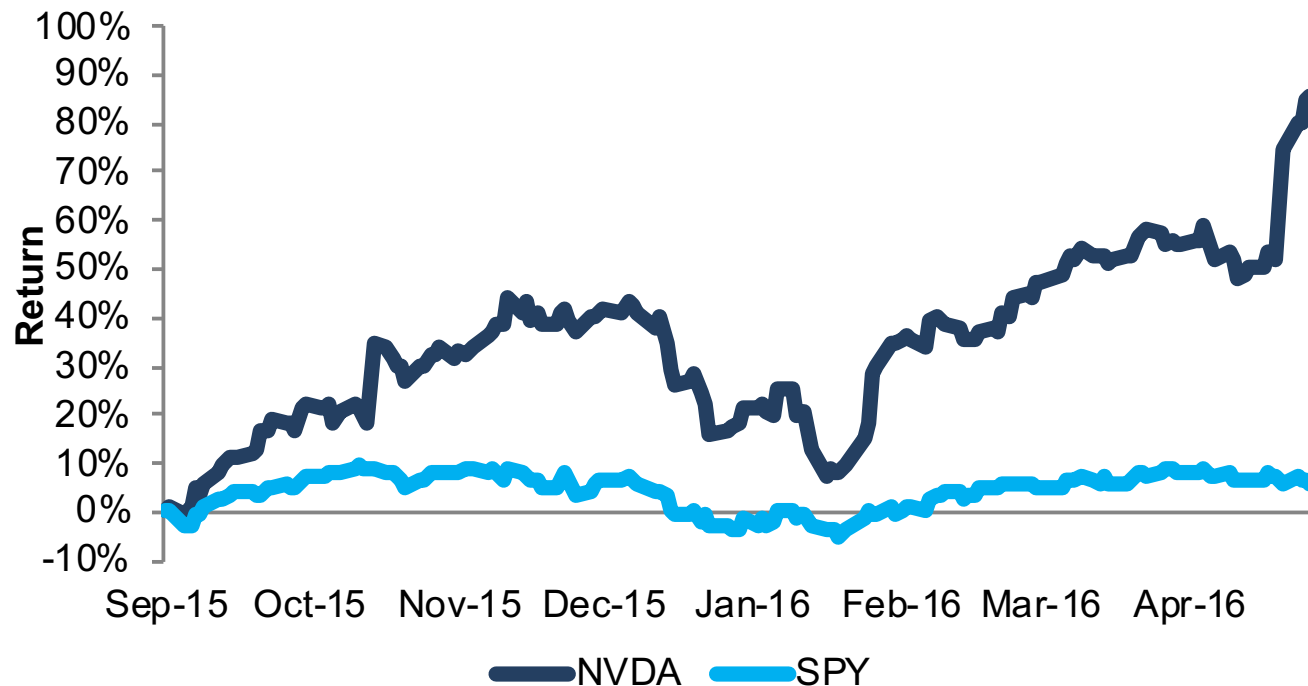
ECONOMICS DRIVE PERFORMANCE

Buy Call on 9/24/2015: NVIDIA (NVDA)

Accounting Results Missed the Bigger Picture

1. 2015 GAAP earnings understated by \$60 million write-down (9% of GAAP results)
2. Up 86% while SPY +6% while rated “Attractive”
3. Up 41% vs SPY +6% when we closed official position on 12/10/15

NVDA Outperformed SPY by 80%



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How do you protect yourself?

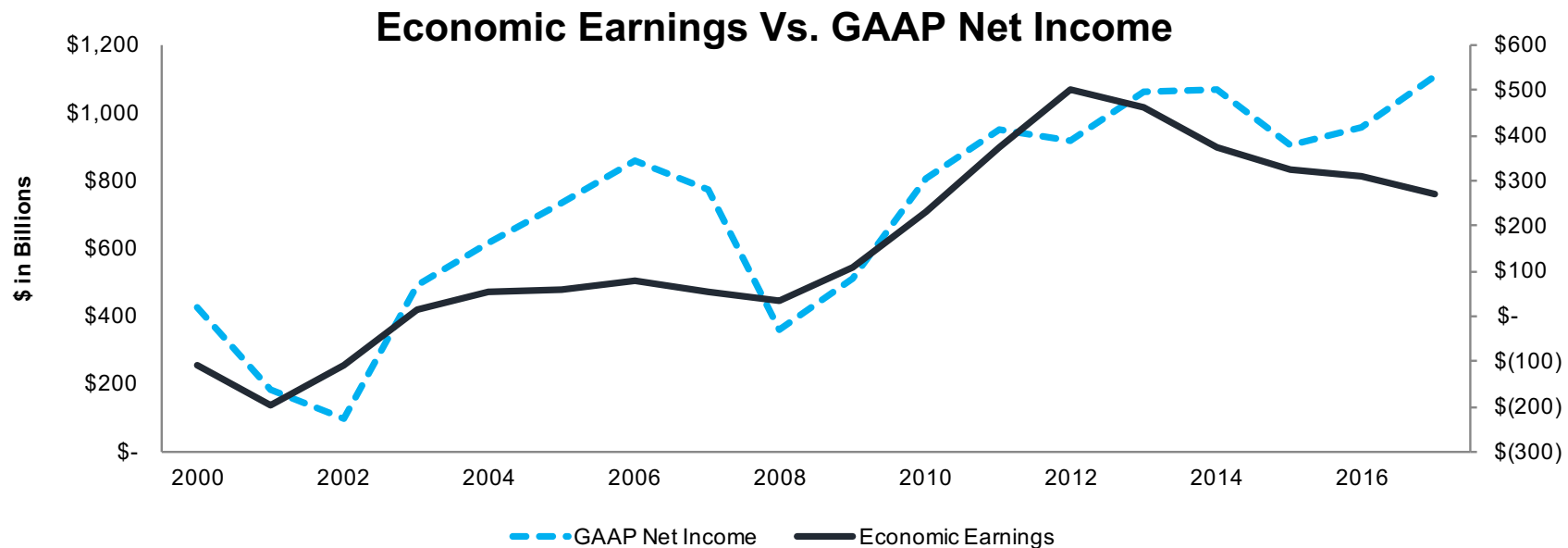
FOCUS ON ECONOMIC EARNINGS

(Unscrubbed) Earnings Trends Are Misleading

“Look at the financial footnotes in 10-K filings and the gains then disappear”

“Only 1 sector has experienced real earnings gains in the past 12 months”

– MarketWatch.com [5/4/17](#) & [2/28/18](#)



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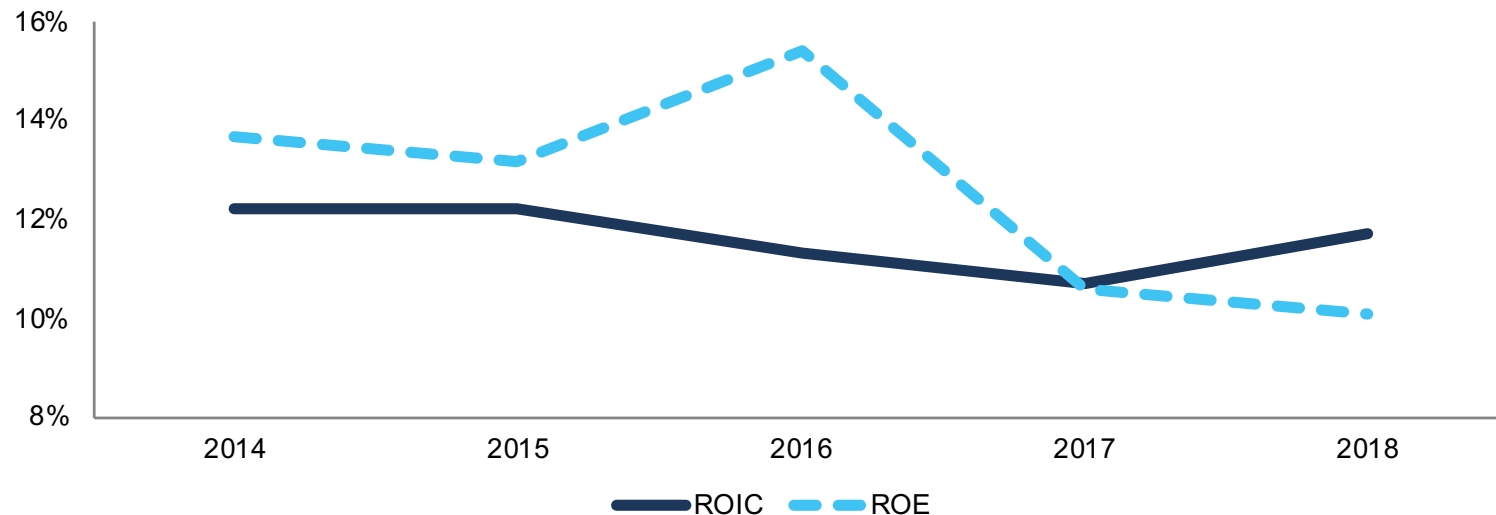
MAKING MONEY WITH ROIC

Autoliv (ALV) – Divergence Between ROE and ROIC

Autoliv (ALV)

- In 2018, ROE decreased from 11% to 10% while ROIC increased from 11% to 12%.
- Valuation looks expensive at P/E of 35
- Stock is actually underpriced at \$77/share – [Price to Economic Book Value \(P/EBV\)](#) is 0.8

Misleading Decline in ROE



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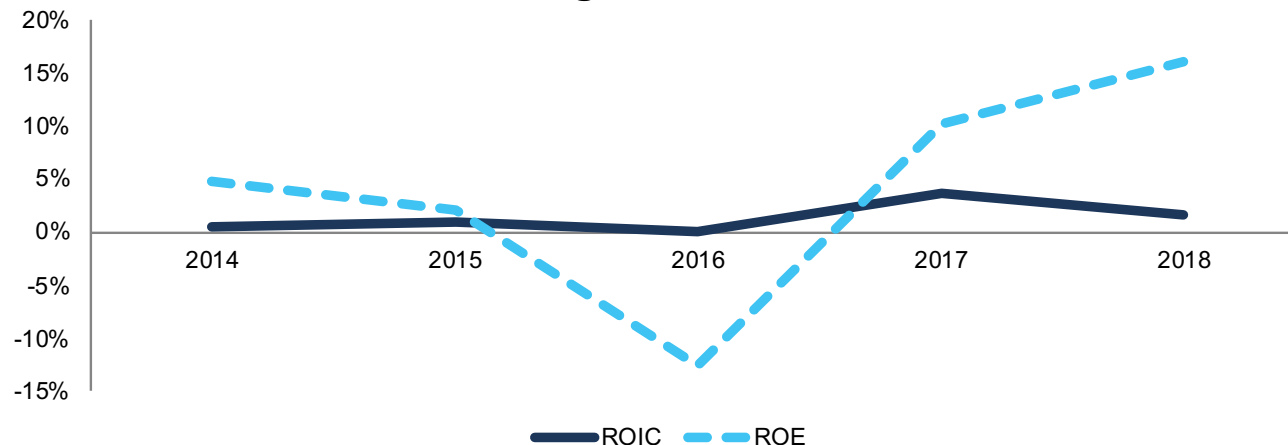
MAKING MONEY WITH ROIC

Brooks Automation (BRKS) – Unprofitable and Overvalued

Brooks Automation (BRKS)

- Consistently low ROIC, has never earned positive economic earnings
- ROE benefits from tax gains, discontinued operations, and decreased reserves
- P/E of 19, below S&P 500 average of 21
- Stock is overpriced at \$31/share – Current economic book value is negative

Misleading Increase in ROE



More details on valuation:

To justify its current price of \$31/share, BRKS must maintain 4% NOPAT margins and grow NOPAT by 20% compounded annually for the next 15 years. [See the math behind this dynamic DCF scenario](#). These expectations seem overly optimistic given that BRKS has grown NOPAT by just 5% compounded annually since 2004.

If BRKS were valued at the S&P 500 average PEBV of 2.6, it would be worth just \$14/share, a 55% downside from the current price.

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Core Problem: GAAP is exploitable.

Only Solution: Read the Footnotes and MD&A.

Traditional P&L

Revenues

- operating expenses

= pretax earnings

- taxes

= Reported Profit

Economic P&L

Revenues

- operating expenses

- **Hidden Incomes/Charges**

= pretax earnings

- taxes

= Profit

- **capital charge/hidden liabilities and assets**

= Economic Profit

Scouring the Footnotes and MD&A of 10-Ks

- Hidden Expenses/Income
- Unrecorded Goodwill
- Impairments
- Unconsolidated Subsidiaries
- Minority Interests
- Unrealized Gains/Losses
- Changes in Accounting Rules
- Derivatives Exposure
- Customer Concentration
- FASB 159
- Employee Stock Options
- Option Valuation Assumptions
- Operating Leases
- Loan Loss/LIFO Reserves
- Pension Assumptions
- Excess Cash
- Pension Over/Under Funding
- Auditor's Opinions
- Carrying Value vs Fair Value
- Mid-year acquisitions

GETTING TO THE ECONOMICS

Measuring Key Results

- **NOPAT** ➡ core operating earnings after-tax
- **Invested Capital** ➡ all cash invested in the business
- **WACC** ➡ rent management must pay for use of capital

Return on Invested Capital = NOPAT/Avg Invested Capital

Economic Earnings = (ROIC – WACC) * Invested Capital

- Aka: “EVA”, economic profit, residual income

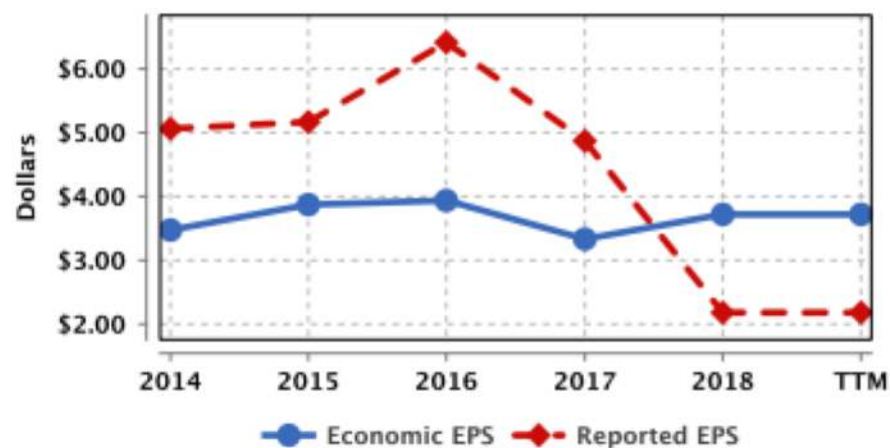
Part IV

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Compare reported vs economic results

Accounting vs Economic Earnings



Earnings & Valuation Diligence Summary

- ALV's accounting earnings understate its economic earnings, which equal $(\text{ROIC} - \text{WACC}) \times \text{Average Invested Capital}$.
- For ALV, we made a total of \$3,302 million in income statement and balance sheet adjustments to convert accounting earnings to economic earnings in FY18.
- We made \$2,821 million in adjustments in our DCF valuation of the stock.
- See Appendix 1 for details on our calculations of key metrics and Appendices 2 and 3 for details on our [adjustments](#).

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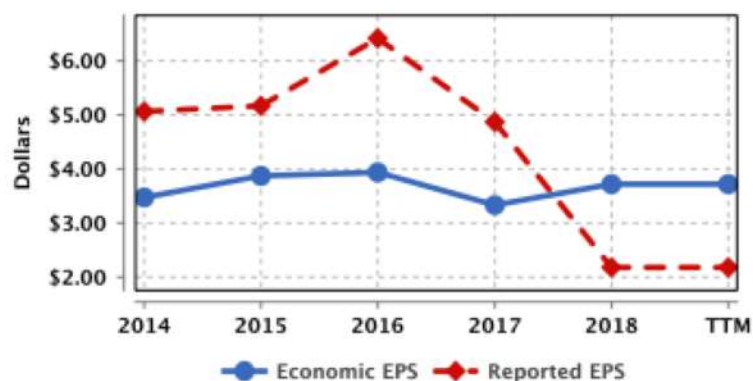
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Get more details on drivers of value

Investment Rating Details

Risk/Reward Rating	Quality of Earnings		Valuation		
	Economic vs Reported EPS	Return on Invested Capital (ROIC)	FCF Yield	Price-to-EBV Ratio	Growth Appreciation Period (yrs)
Very Unattractive	Misleading Trend	Bottom Quintile	<-5%	> 3.5 or -1 < 0	> 50
Unattractive	False Positive	4th Quintile	-5%<-1%	2.4 < 3.5 or < -1	20 < 50
Neutral	Neutral EE	3rd Quintile	-1%<3%	1.6 < 2.4	10 < 20
Attractive	Positive EE	2nd Quintile	3%<10%	1.1 < 1.6	3 < 10
Very Attractive	Rising EE	Top Quintile	>10%	0 < 1.1	0 < 3
Actual Values	\$3.72 vs. \$2.18	12%	17%	0.9	< 1
Sector ETF (XLY)	Positive EE	17%	3%	4.3	37
S&P 500 ETF (SPY)	Positive EE	18%	2%	2.4	39

Accounting vs Economic Earnings



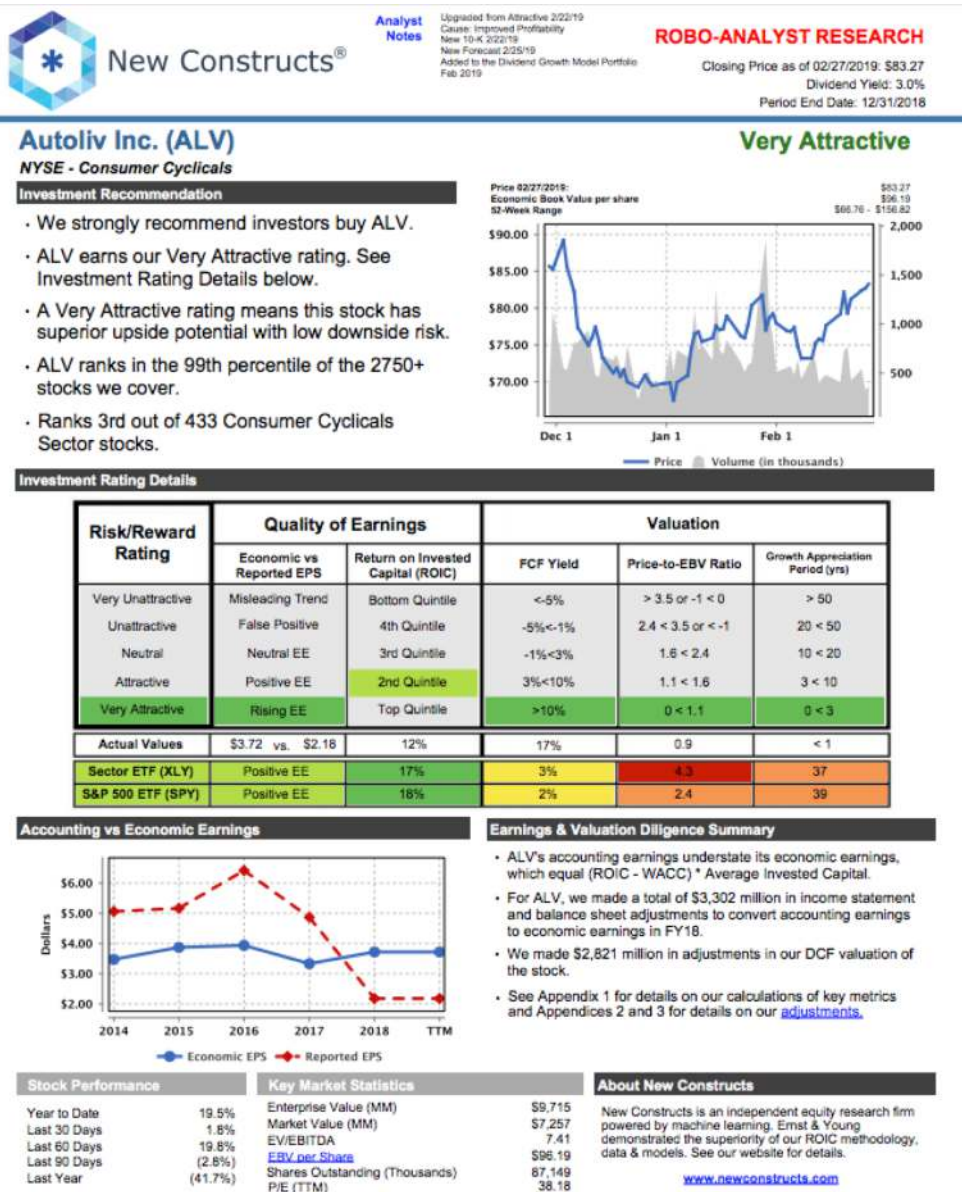
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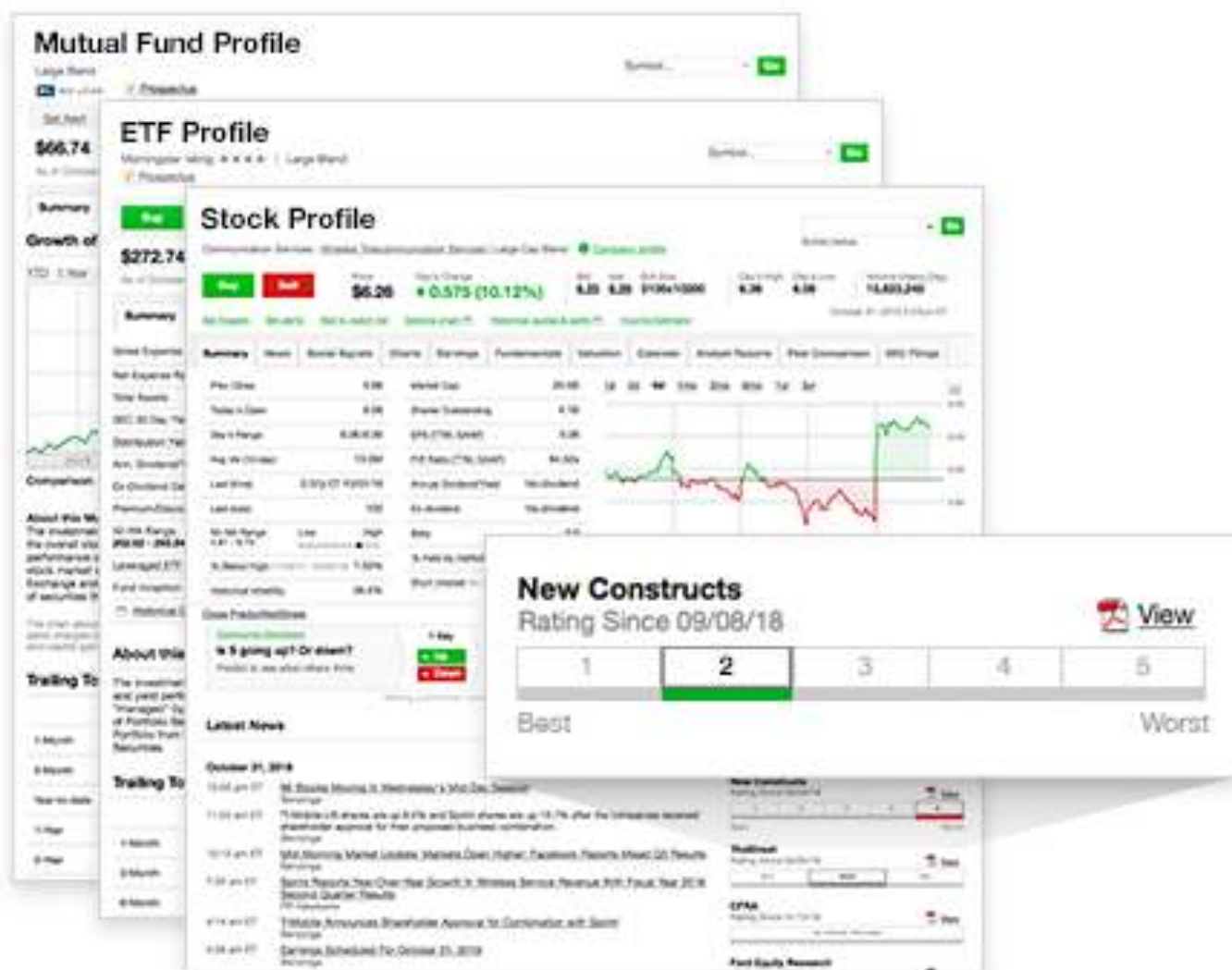
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Price: **\$6.26**
Day's Change: **+0.575 (10.12%)**
Vol: **8.25**
Ask: **6.26**
Bid: **6.25**
52-Week High: **6.36**
52-Week Low: **5.06**
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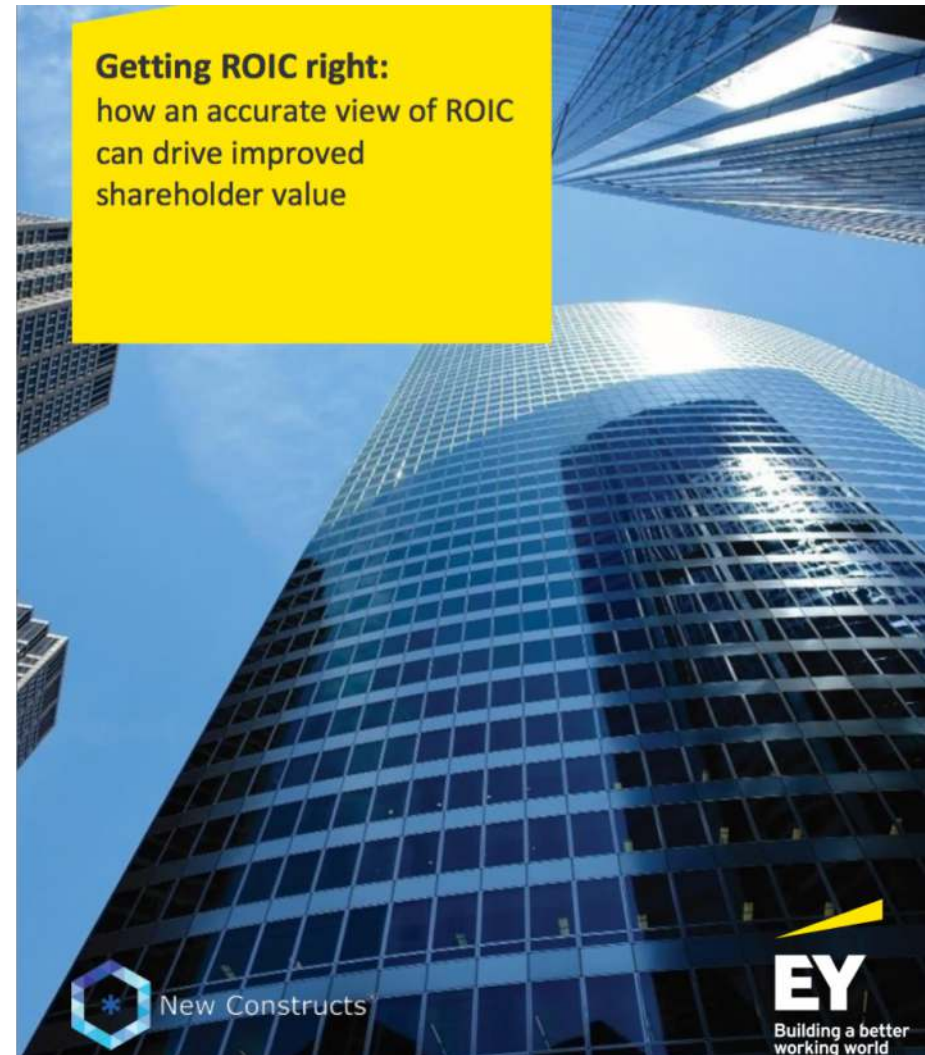
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White Paper: Investors Deserve Better Data



- It's not often that a big 4 accounting firm like E&Y features the material superiority of a research firm's analytics.
- The white paper provides specific examples for specific companies.
- Google "Revenue 48,778", "long-term debt 16,215" to see which company is "Peer 1".

Click [here](#) for a copy.

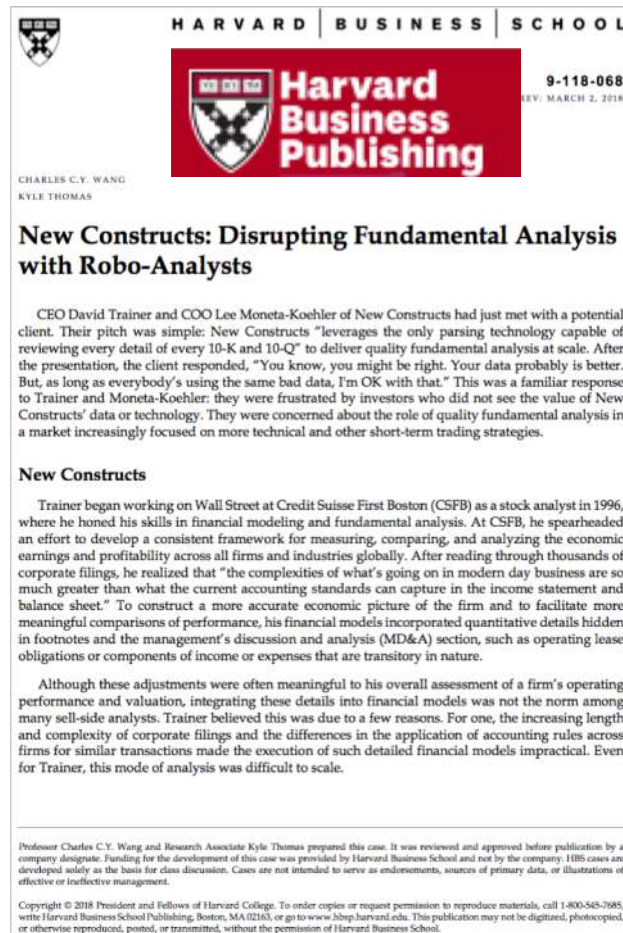


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Harvard Business School Case Study features our Research Automation technology. “Disrupting Fundamental Analysis with Robo-Analysts”

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CHARLES C.Y. WANG
KYLE THOMAS

New Constructs: Disrupting Fundamental Analysis with Robo-Analysts

CEO David Trainer and COO Lee Moneta-Koehler of New Constructs had just met with a potential client. Their pitch was simple: New Constructs “leverages the only parsing technology capable of reviewing every detail of every 10-K and 10-Q” to deliver quality fundamental analysis at scale. After the presentation, the client responded, “You know, you might be right. Your data probably is better. But, as long as everybody’s using the same bad data, I’m OK with that.” This was a familiar response to Trainer and Moneta-Koehler: they were frustrated by investors who did not see the value of New Constructs’ data or technology. They were concerned about the role of quality fundamental analysis in a market increasingly focused on more technical and other short-term trading strategies.

New Constructs

Trainer began working on Wall Street at Credit Suisse First Boston (CSFB) as a stock analyst in 1996, where he honed his skills in financial modeling and fundamental analysis. At CSFB, he spearheaded an effort to develop a consistent framework for measuring, comparing, and analyzing the economic earnings and profitability across all firms and industries globally. After reading through thousands of corporate filings, he realized that “the complexities of what’s going on in modern day business are so much greater than what the current accounting standards can capture in the income statement and balance sheet.” To construct a more accurate economic picture of the firm and to facilitate more meaningful comparisons of performance, his financial models incorporated quantitative details hidden in footnotes and the management’s discussion and analysis (MD&A) section, such as operating lease obligations or components of income or expenses that are transitory in nature.

Although these adjustments were often meaningful to his overall assessment of a firm’s operating performance and valuation, integrating these details into financial models was not the norm among many sell-side analysts. Trainer believed this was due to a few reasons. For one, the increasing length and complexity of corporate filings and the differences in the application of accounting rules across firms for similar transactions made the execution of such detailed financial models impractical. Even for Trainer, this mode of analysis was difficult to scale.

Professor Charles C.Y. Wang and Research Associate Kyle Thomas prepared this case. It was reviewed and approved before publication by a company designate. Funding for the development of this case was provided by Harvard Business School and not by the company. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

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THE TECHNOLOGY WORKS = DILIGENCE WITH SCALE

3rd-Party Validation By Harvard Business School & MIT Sloan

The Relation between Earnings and Future Cash Flows: A New Perspective*

Ethan Rouen

Harvard Business School

Eric So

Massachusetts Institute of Technology

Sloan School of Management

Charles C.Y. Wang

Harvard Business School

July 2018

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Abstract

We provide new evidence on the usefulness of financial accounting in valuation analysis. A fundamental assumption in the use of GAAP financial statements for valuation is that accrual-based measures of firms' performance convey information about future cash flows incremental to current cash flows. However, recent evidence casts doubt on this assumption. We revisit this issue using a novel dataset that details *all* quantitative disclosures in firms' annual reports and identifies non-core revenues and expenses from net income, including those reported on the income statement and those hidden in the footnotes or the MD&A. Using these data to adjust GAAP net income, we show the resulting measure of core earnings offers forecasting power for future cash flows and earnings that are incremental to traditional measures of performance. These adjustments also better explain contemporaneous market prices and returns. Together, our results suggest that accounting information remains relevant for valuation and highlight the importance of careful accounting analysis for distilling information relevant for forecasting future performance.

Quotes from the initial draft of the paper:

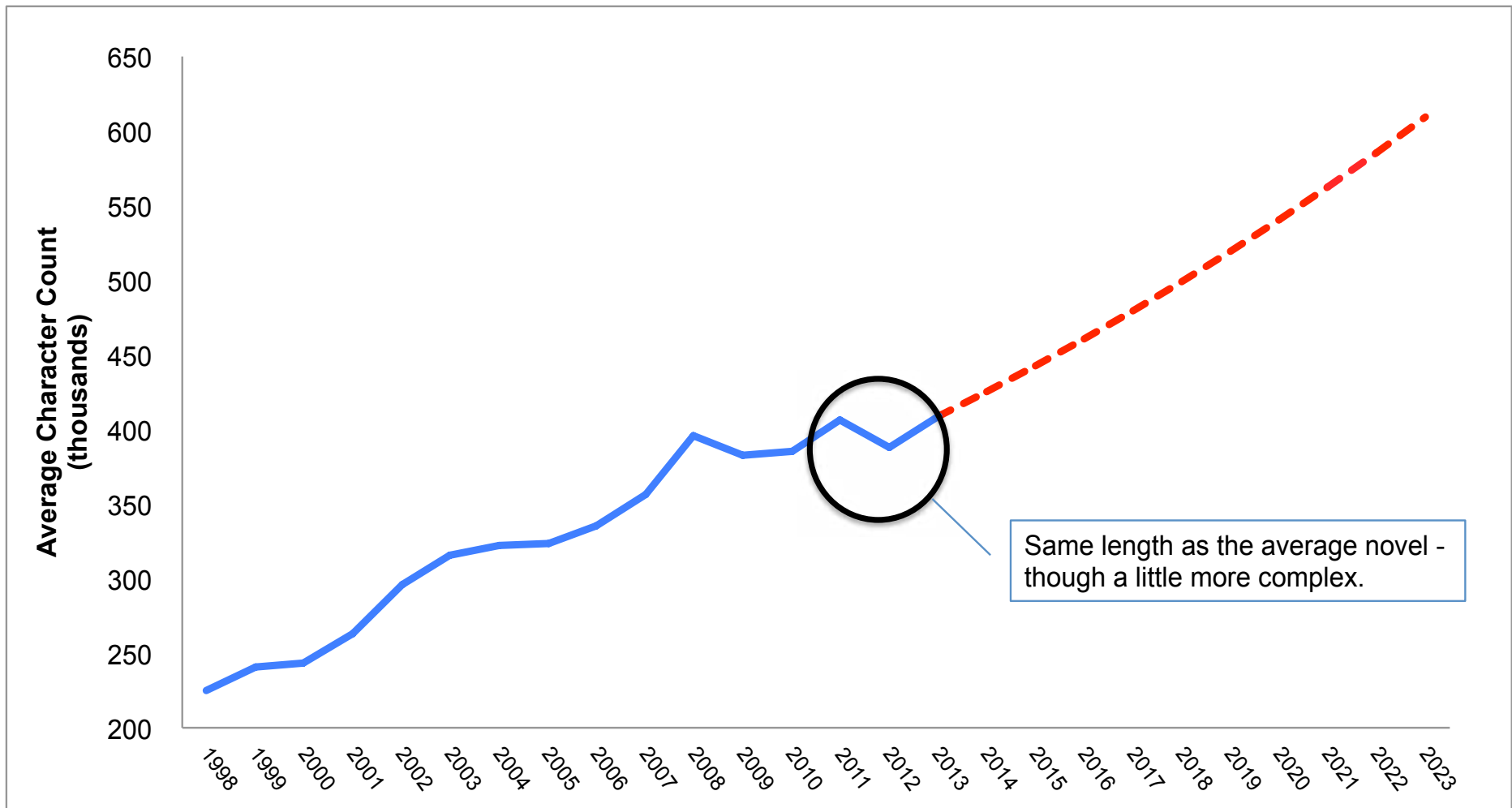
- “this paper serves as a warning for researchers seeking to examine the value relevance of earnings.”
- “Data aggregators like Compustat do not appear to collect and provide data on many non-operating or less persistent income-related items, even when managers make these adjustments in non-GAAP disclosures.”
- “We find that, in many instances, Compustat does not report these disclosures— which can appear on the income statement as a separate line item or in the footnotes or the MD&A—in any of its fields.”
- “These shortcomings make it difficult for users to construct a complete picture of a firm’s earnings, but taking additional steps to adjust to GAAP net income can provide valuable insights.”

Part V

Why you need protection now more than ever.

FILINGS GETTING LONGER & LONGER

Keeping Up With Disclosures Is Nearly Impossible



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DISCLOSURE TRENDS ARE NOT YOUR FRIEND

More Data, More Noise, More Complexity

- Filings have grown to **200+ pages**
(That's longer than the average novel.)
- Increasingly complex and time-consuming work
- Accounting rules are constantly changing



RISE ABOVE RECORD LEVELS OF NOISE

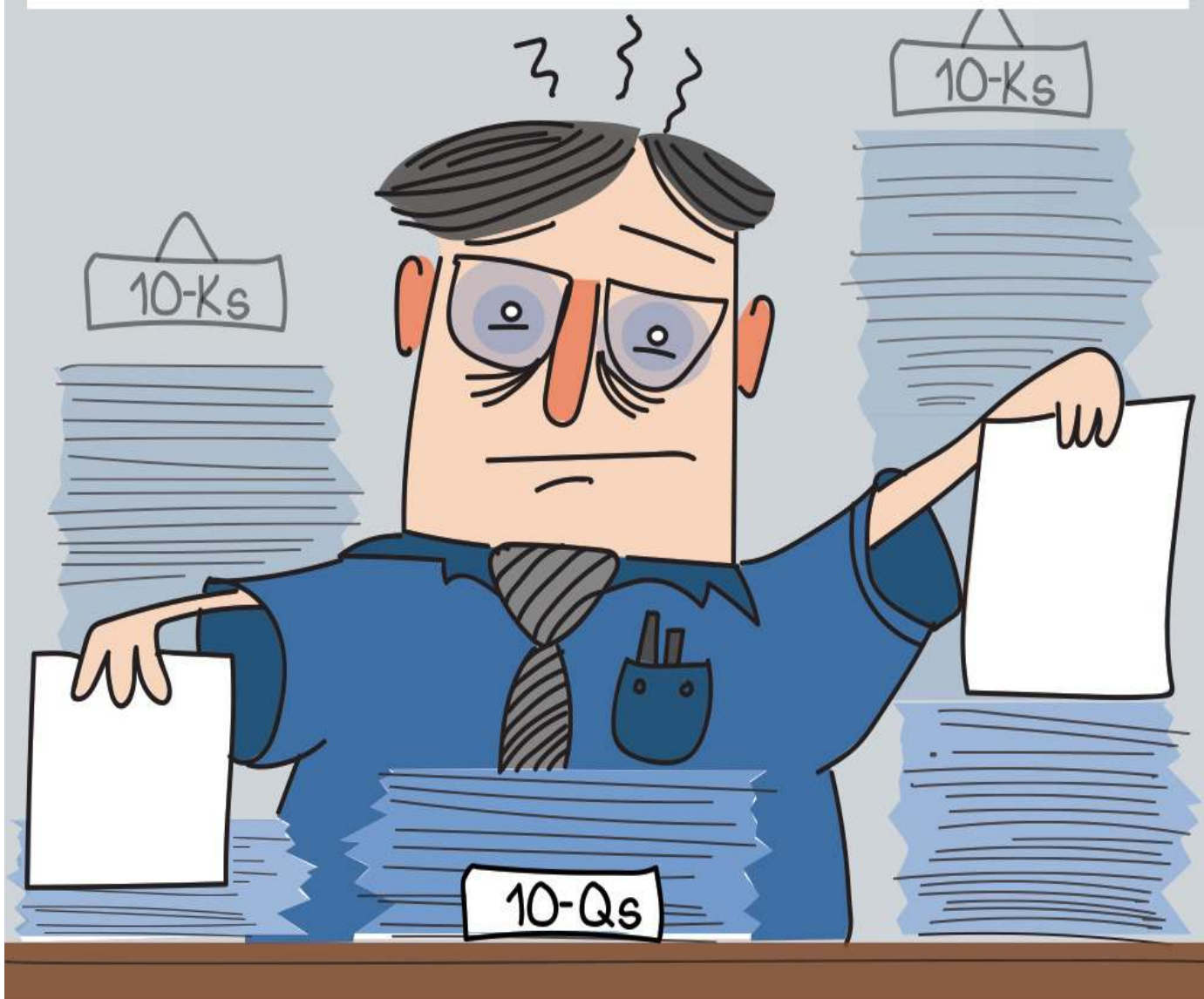
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Appendix

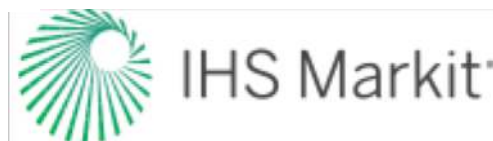
SUCCESS WITH ELITE INSTITUTIONAL CLIENTS

Self-Directed Clients Are Natural Fit for Simpler Products

- Top hedge fund and institutional money managers
- Top wealth management firms
- Top advisors
- Top accounting, insurance & consulting firms



Harvard Business School
&
MIT Sloan



HOW THE WEALTH INDUSTRY WORKS WITH US

Multiple models, Great Flexibility



- **Institutions:** full access to models and tool, including database feeds. Directly access thru our website



- **Advisors/RIAs:** firm or group-wide access to unlimited research. Direct access via our website or thru partners.



- **Retail:** individual sign up for Gold, Platinum or Pro subscriptions. Direct access via our website or thru partners.

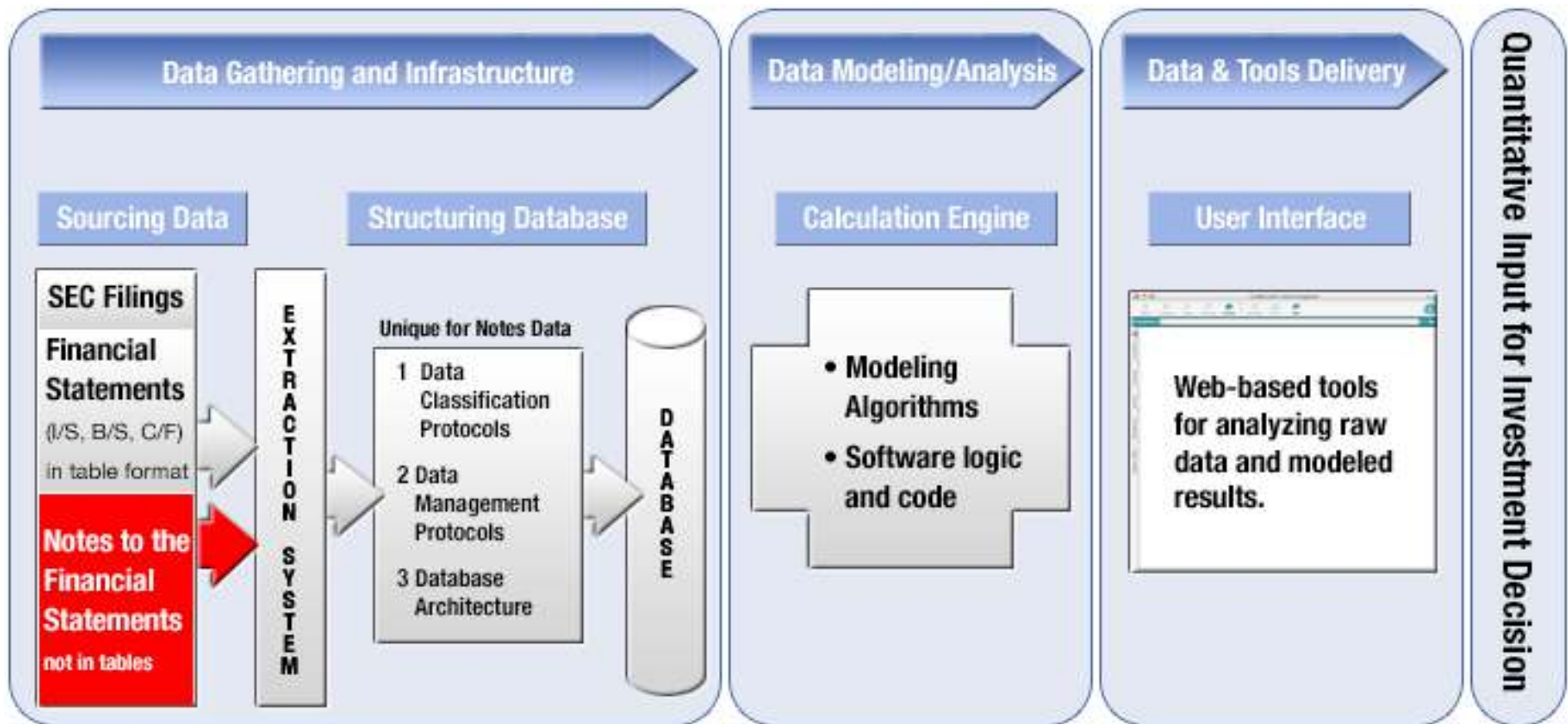


- **Consultants/Corporates:** custom engagements focused on enterprise value optimization and investor relations strategy. Direct access via our website along with custom work and consultation via partners.



RESEARCH TECHNOLOGY PLATFORM

Data Collection & Modeling Under One Roof



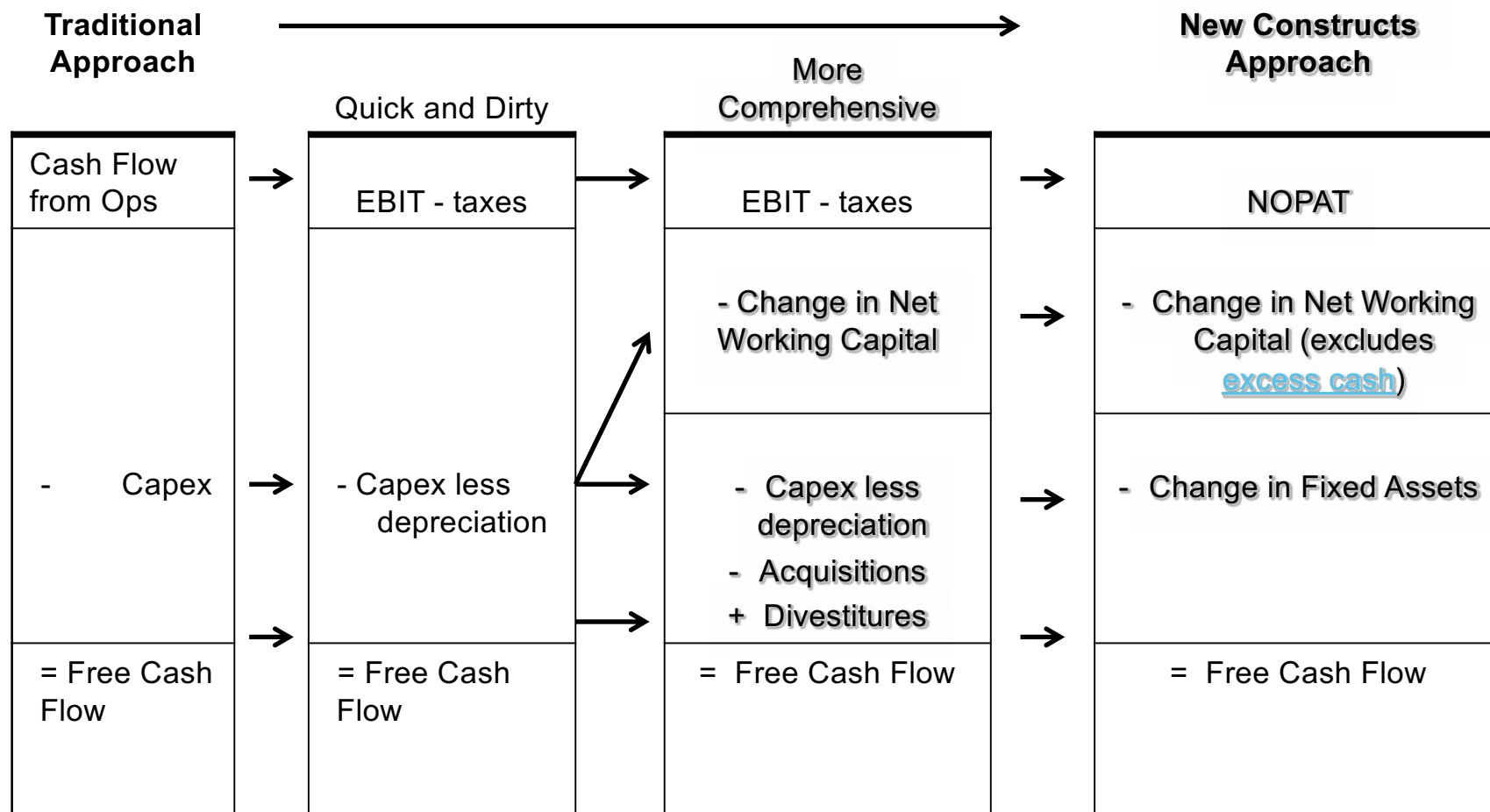
We created our own data collection technology to provide high integrity models to clients. Traditional data feeds are not trustworthy for sophisticated financial modeling.

VERSUS OTHER RESEARCH OFFERINGS

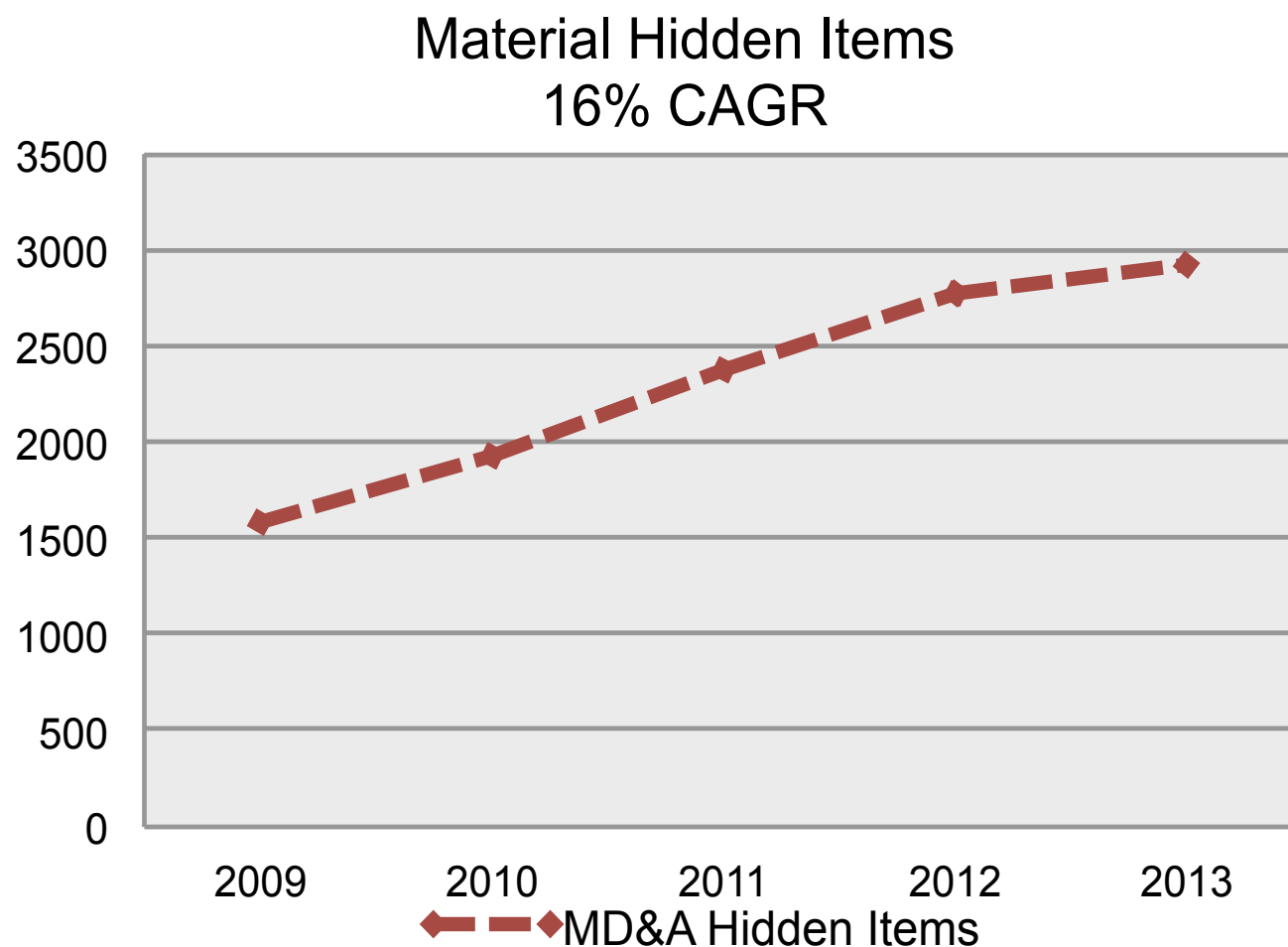
	Coverage			Cash Flow Focus (Non-GAAP)		Consistent Due Dilligence		Transparency/Links To		Independence	
	Stocks	ETFs	Mutual Funds	ROIC & Economic Earnings	Reverse DCF	Footnotes	MD&A	Calculations	SEC Filings/Source Data	Not Paid By Funds or Companies Covered	No Banking or Trading Revenues
New Constructs	√	√	√	√	√	√	√	√	√	√	√
Credit-Suisse HOLT	√			√	√			1/2			
EVA Dimensions/ISS	√			√						√	√
MorningStar	√	√	√	black box							√
CFRA/S&P	limited			limited						√	√
S&P Capital IQ	√										√
Zack's	√										√
Other Sell-Side	√										
Valuentum.com	√	√						limited		√	√
Finbox.io	√							limited		√	√
GuruFocus	√			√						√	√
Other Firms	√									?	?

*This graph was created based on information collected and analyzed by New Constructs, LLC. New Constructs regularly gathers information from over 3,000 companies' 10Ks, including the Notes to the Financial Statements and MD&A.

Free Cash Flow: NOPAT minus Change in Invested Capital *How We Compare to traditional approaches to FCF*



BIGGER HAYSTACKS, MORE NEEDLES



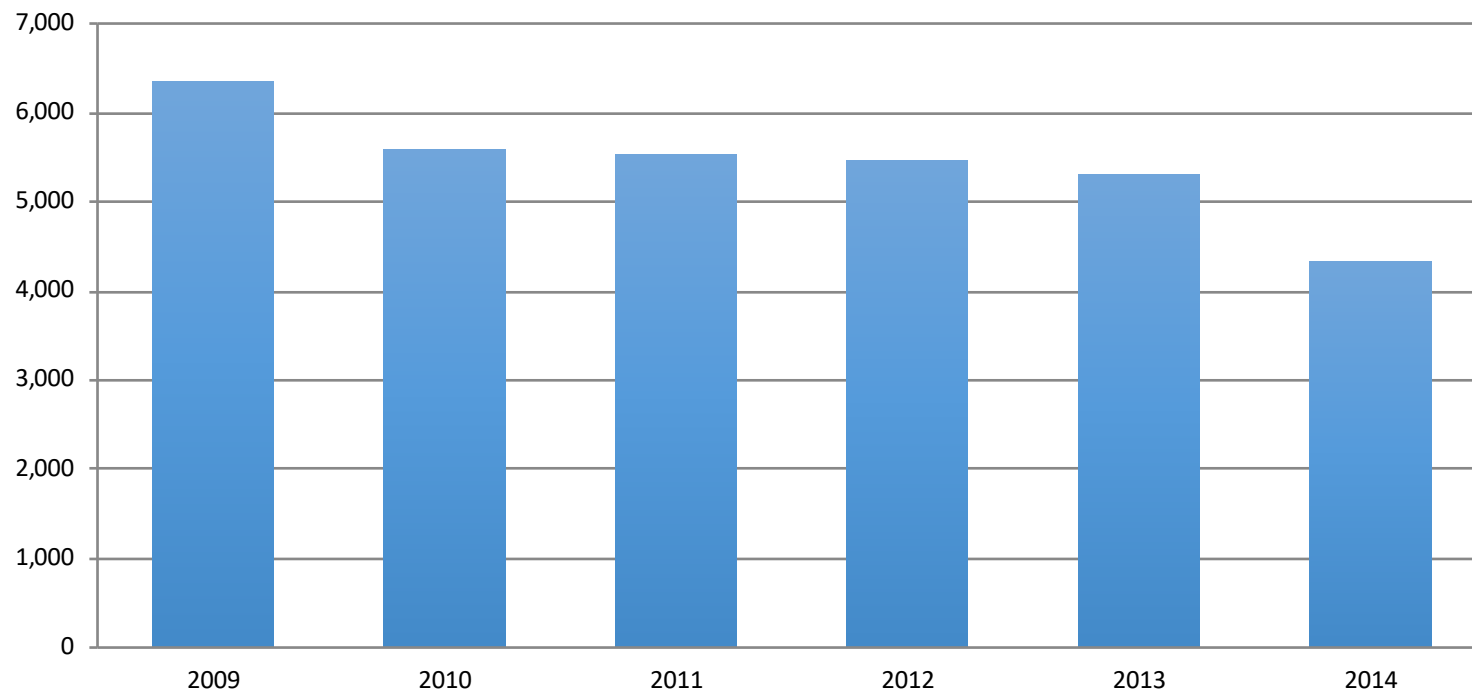
Items found only in the MD&A (e.g. gains, charges, deferred items, etc) that distort income statement results are rising rapidly.

ASSET WRITE-DOWNS ARE A RED FLAG

32,583

Over the last 5+ Years, we found 32,583 write-downs.

of Write-Downs



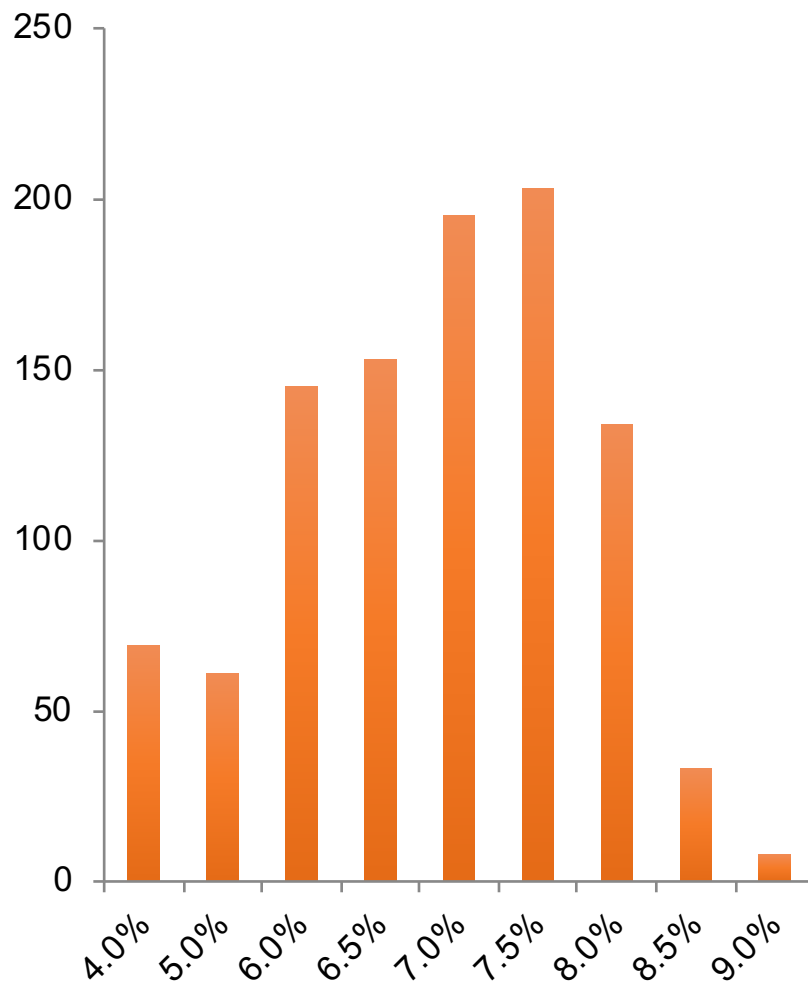
■ Total - 3000+ companies

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Confidential - New Constructs, LLC

MANAGEMENT'S INFLUENCE ON PROFITS

**Distribution of Return On Plan
Asset Assumptions**



Auditors & investors need to know this data.

- Raising the expected Return on Plan Assets (EROPA) reduces reported pension expense.
- The mean EROPA for 2014 was 6.5%. Roughly 55% of companies expect a long-term return on plan assets between 6.5% and 7.5%.
- Virtusa Corp (VRTU) has the most aggressive assumptions, with EROPA of 10.38%, followed by Exlservice Holdings (EXLS) at 9%.

*This graph was created based on information collected and analyzed by New Constructs, LLC. New Constructs regularly gathers information from over 3,000 companies' 10Ks, including the Notes to the Financial Statements and MD&A.

New Constructs has no trading, corporate or banking ties – no conflicts.

- *Morningstar gets paid by fund companies. Fund companies must license ratings from Morningstar to use them in marketing materials.*

New Constructs = unadulterated expertise in accounting, finance and SEC filings.

HOW HAS INVESTING CHANGED OVER THE YEARS?

Shorter Holding Periods for Stocks

- Until mid-1960's average holding period was seven years
- Today, average holding period is less than one year and annual portfolio turnover is more than 100%¹

Major Reactions to Quarterly Earnings

- Stock prices make large moves in response to earnings surprises
- Suggests that long-term cash flows are less important

Amateur Individual Investors - Growth Market

- Schwab, TD Waterhouse, Scottrade
- Day trading

Media - Growth Market

- TV: Mad Money, CNBC Squawk Box, and Squawk on the Street
- Print: Wall Street Journal, Investors Business Daily, local newspapers
- Web: Motley Fool, TheStreet.Com, CBS MarketWatch

¹Rappaport, Alfred. "The Economics of Short-Term Performance Obsession." *Financial Analysts Journal*, vol. 61, no. 3 (May/June): 65-79.

WHICH ARE YOU: INVESTOR OR SPECULATOR?

Speculator

“If you are a speculator, your decision to buy or sell is based on what you believe about the near-term direction of price.”
- Ben Graham

“...speculation is the activity of forecasting the psychology of the market.”
- John Maynard Keynes

Vs.

Investor

“If you are an investor, your decision to buy and sell is based on the underlying economics of the stock you own.”
- Ben Graham

“Investing is an activity of forecasting the yield on assets over the life of the asset...”
- John Maynard Keynes

ONLY 3 WAYS TO BEAT THE MARKET

Better Data - difficult and expensive to obtain

- Gathering and analyzing data from the Notes to the Financial Statements provides a competitive advantage.

Better Analysis - not just your neighbor, one must out-think the entire market

- Better data means better models.
- Better models provide better analysis.

Better Discipline - stick to your guns, don't follow the herd.

- Long and short strategy is built on specific, quantifiable thresholds derived from a model we can trust.
- Our models do all the number crunching to supply our human capital with superior information and decision-making capabilities.

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