1% Focus Report:

Ford Motor Company (F)

YCHARTS

Published March 31, 2014

The 1% Focus Report hones in on the valuation drivers underlying a firm in either the top or bottom Value Score deciles in YCharts' data universe. The report is designed to be a visual form of financial statement analysis, allowing for an analyst or portfolio manager to understand the financial metrics that drive the focus company's valuation.

The Value Score is a quantitative six-factor model designed to separate companies according to their relative (rather than absolute) valuation; companies with a Value Score of 10 (highest) have historically performed much better than the S&P 500 index and those with a Value Score of 1 have historically performed worse.

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Valuation at a Glance: Ford Motor Company (F)

VALUE SCORE

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The Value Score is a quantitative six-factor model designed to separate companies according to their relative (rather than absolute) valuation.

Companies with a Value Score of 10 (VS10) have historically performed much better than the S&P 500 index, and those with a Value Score of 1 (VS1) have historically performed worse.

Learn more by reading the Value Score Support Page or our separate document "The Big Picture: YCharts Value Score".

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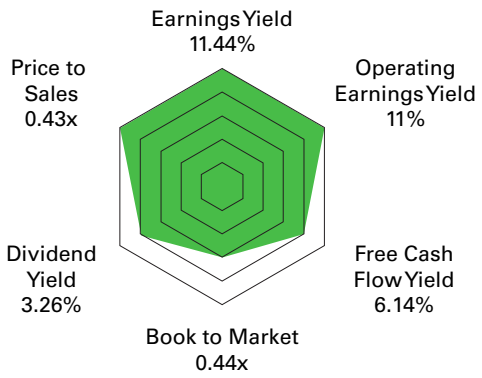
Focus on Ford Motor Company

Ticker	F
Name	Ford Motor Co
Industry	Auto Manufacturers
Market Capitalization	60,459
TTM Sales	146,917
TTM CFO	10,444
TTM CFO Margin	7%
Mkt Cap /TTM Sales	0.4
Mkt Cap /TTM CFO	5.8
Long-Term Debt	101,512
Shareholders' Equity	26,383
D/E Ratio	385%
Altman's Z-Score	1.7
Beta	2.5
Return on Equity	35.9%

Value Score Factors



Ford is the quintessential picture of an endangered species—the American manufacturer.

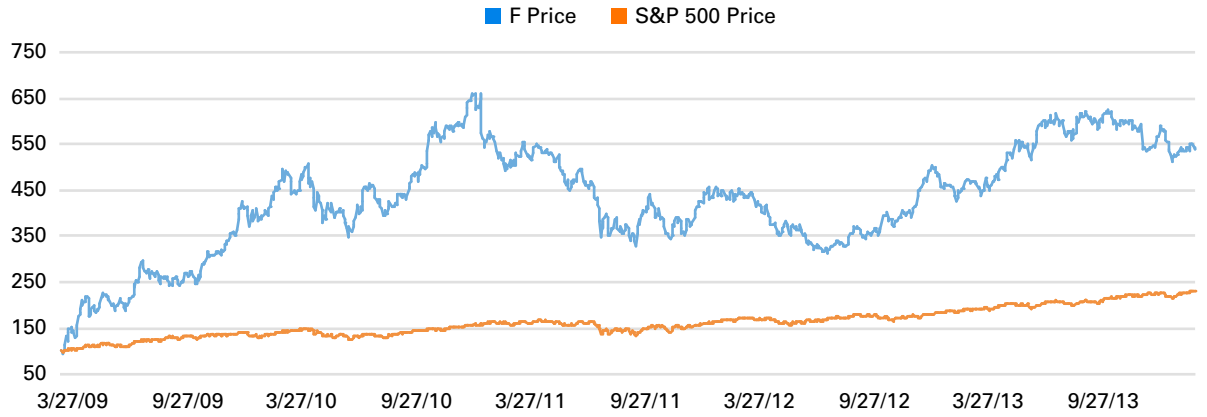
Like any manufacturer, Ford's business has an enormous degree of operating leverage, so the value of the company depends, to a great extent, on the demand environment and how closely the company's manufacturing capacity is aligned to meet that demand.

It is for this reason that we primarily concentrate on Ford's demand environment in this Focus Report.

For demand to increase, the customer base must be both willing and able to purchase a company's product. We find that both the willingness—to the extent to which we can measure it—and the ability of Ford's target market to purchase its products has flagged recently. It is unclear whether this is a secular or cyclical phenomenon, and this, along with other uncertainties exist in the valuation of the firm.

(continued on next page)

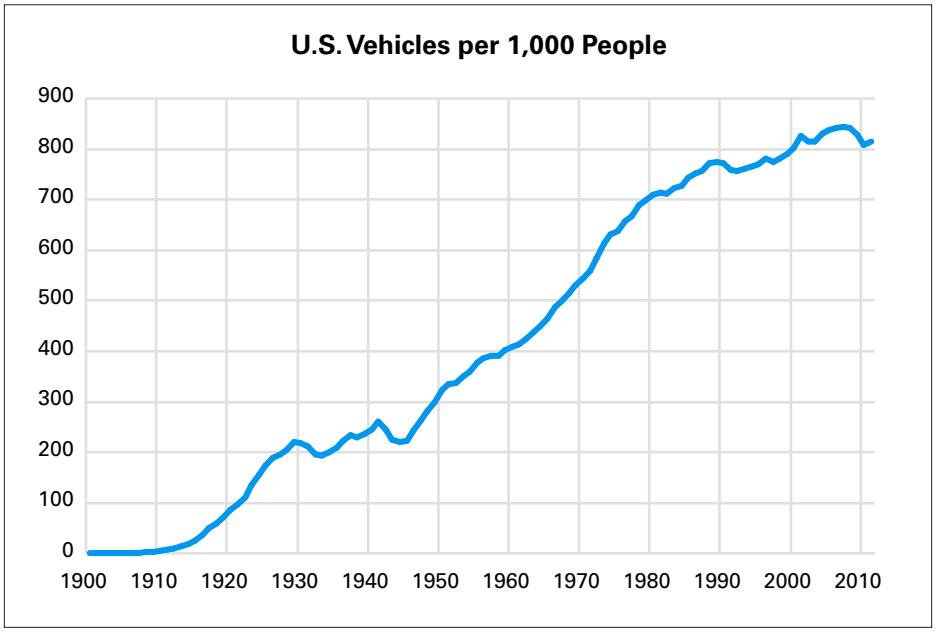
Price of Focus Company vs S&P 500 (Indexed, 5 Years)



Willingness

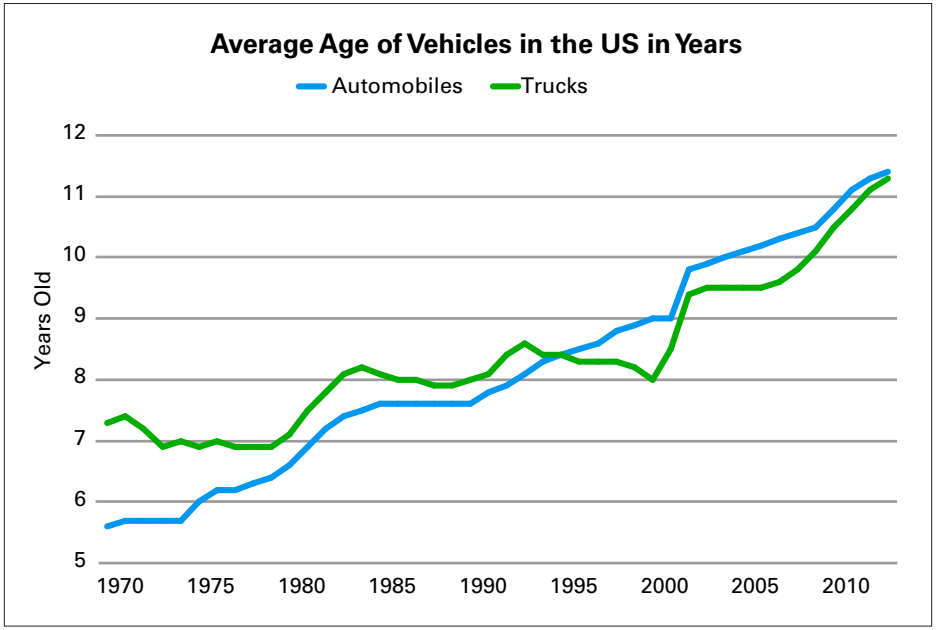
States of mind—willingness included—are difficult things to measure and project. To get a proxy for willingness of consumers to buy cars, we observe three sets of data representing product saturation, likely replacement demand, and demographics.

There are different ways of looking at the degree to which the US automobile market is saturated and most of these seem to be pointing to roughly the same conclusion. The below chart displays the number of cars per 1,000 in population.



From looking at this chart, it is not hard to tell that Ford and the other American car manufacturers' glory days were in the long postwar period until the mid-1970s oil shock. During this period, Ford and its domestic competitors enjoyed not only the fruits of a growing population, but of a growing population that was underserved for vehicles. Eight hundred some odd cars per 1,000 people implies roughly 2.0 cars for every American household and 1.3 cars for every licensed driver. Various academic studies and common sense indicates that this level of ownership would qualify as a saturated market. However, cars wear out, so clearly there will be replacement demand such that ownership rates stay roughly where they are right now, all other things held equal.

Below is a chart representing the age of vehicles on US roads.



While the long flattish period for trucks for the 15-year period from the mid-1980s to the early 2000s might be ascribed to small business demand related to the construction industry, the line for passenger cars has monotonically increased during this time period. This likely reflects the growing saturation of the market and also an improvement in quality of vehicles as international competitors began to make an entrance into the US market.

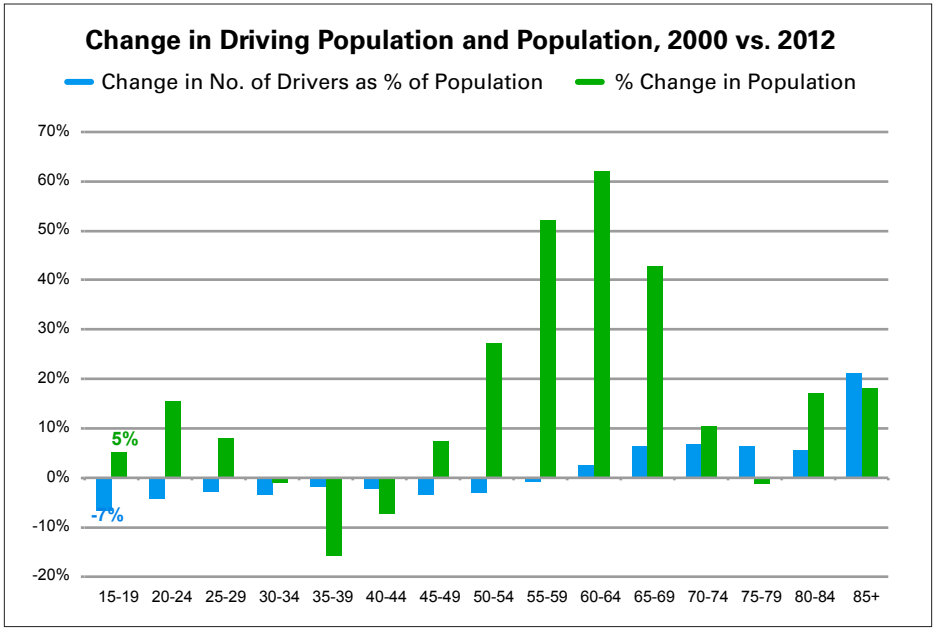
In a previous job, I reviewed and (unfortunately) bought into a complex thesis regarding automobile replacement demand and learned a hard lesson. To wit, no matter how complex and well thought out the argument, all investment arguments boil down to one of two theses: reversion to the mean and fundamental change. The gist of the complex argument (which took the author roughly 60 pages to spell out) was that "natural" replacement demand would eventually force the average age of cars on the road down to the 8-9 year level from the level that existed then—roughly 10.5 years. This reversion to the mean argument demonstrably failed to pan out.

Clearly, there exists a maximum useful life for any mechanical object, but it is difficult, considering demographic shifts and other factors to know what this maximum useful life will

be for automobiles in an investment context. Anecdotally, my household has two cars with an average age of 12.5 years and I can see this age increasing to about 15 before we will likely get rid of the older car and drive the remaining one for a few more years. And while it is never a good idea to make investment conclusions based on anecdotal evidence, it is hard for me to imagine that my case is so much different from other people in my demographic and income bracket.

The last observable piece of willingness has to do with demographic changes. Clearly, there is pressure for people starting a family to move to the suburbs, at which point one cannot reasonably function without eventually getting two cars—one for each parent. While this suburban migration trend has held true in the past, however, there is some question whether it will continue into the future.

The Department of Transportation publishes statistics showing the total number of drivers at different age brackets. The following graph shows the difference between the number of licensed drivers as a percentage of the overall population (as recorded by the census) comparing a 2012 survey to the 2000 one.



The way to read this chart is that, for instance, there are 7 percentage points fewer drivers in the 15-19 year-old age bracket in 2012 than there were in 2000 and at the same time, 5% more people in that age bracket in 2012 than in 2000. The interesting thing to note from this chart is that until we reach the Baby Boomer cohort (marked by the enormous green peak in the above chart), the proportion of licensed drivers to population is lower for all age groups in 2012 versus 2000.

There is a bullish and bearish way to analyze these data. On the bullish side, if spending on autos among the 15-29 year-old cohort has been restrained due to cyclical factors (e.g., the Great Recession, student debt repayment, etc.), the difference between the level of the green columns and the blue ones in those cohorts represents pent up demand that will spring back as soon as the cyclical factors work themselves out.

On the bearish side, the fact that the number of drivers as a percentage of the population is lower in those age groups represents a secular, cultural shift away from such an emphasis on automobiles for transportation.

The growth of New Urbanism, an increased tendency to take ecological impact into consideration when making purchase decisions, and increased availability of mass transit, urban bikes for rent, etc., may be fundamentally influencing the way Americans interact with automobiles.

All of these factors might have marginal impact on willingness of Americans to make car purchases if economic considerations were not taken into account. However, to understand the demand environment, one must also understand the ability of American consumers to buy these relatively expensive items.

Ability

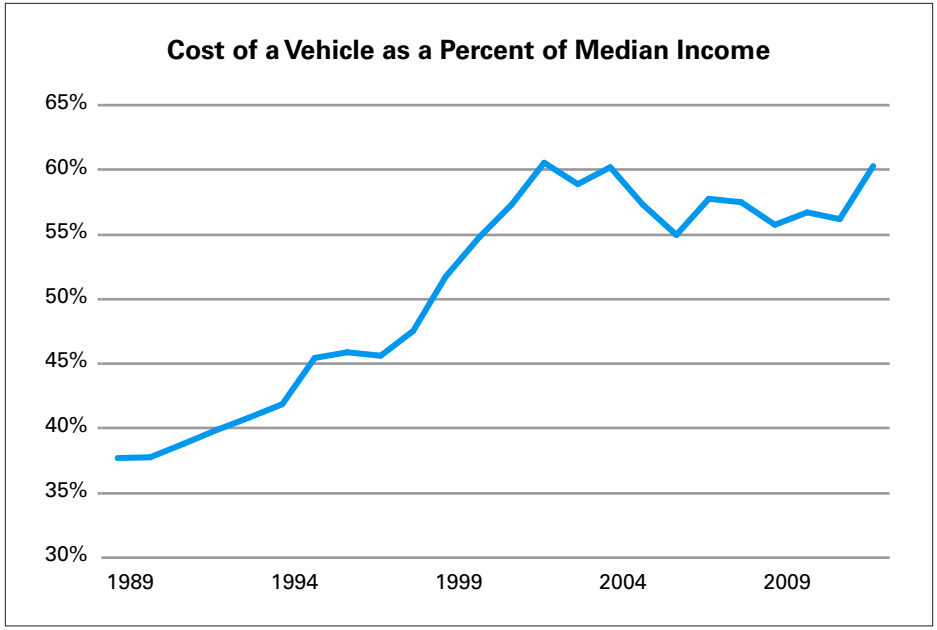
At Ford's heart lies its founder's insight into mass production assembly lines and his belief that the American middle class should enjoy the fruits of what had heretofore been a luxury item—the automobile.

The strategy of targeting American middle classes worked to the extent that the American middle class was able to purchase the company's products. Ford believed in a capitalistic noblesse oblige by which a good manager would offer generous enough pay to workers for them to be able to buy the product they were manufacturing. In a real sense, Henry Ford bootstrapped the American middle class and created a market into which his company could sell its own products.

Even today—more than a century after the founding of the firm—roughly two-thirds of Ford's sales are generated in its North American division. Another mid-teens percentage of sales is generated in markets in developed Europe (UK and Germany), leaving 20%-25% of revenues to be generated elsewhere. Operating margins are typically much higher for the North American business than for its other geographical segments, meaning that, from a profit perspective, even more of Ford's value is supported by its position in its home geography.

The Twentieth Century belonged to the U.S., with the country transforming from a vast, isolationist, and rural nation to become the world's preeminent superpower; as such, the strategy of selling means of transportation to its increasingly affluent citizens was a good one (recall the chart showing the number of automobiles per 1,000 people above). However, the effects of globalization and a trend toward shifting manufacturing offshore has altered the economic equation in the US.

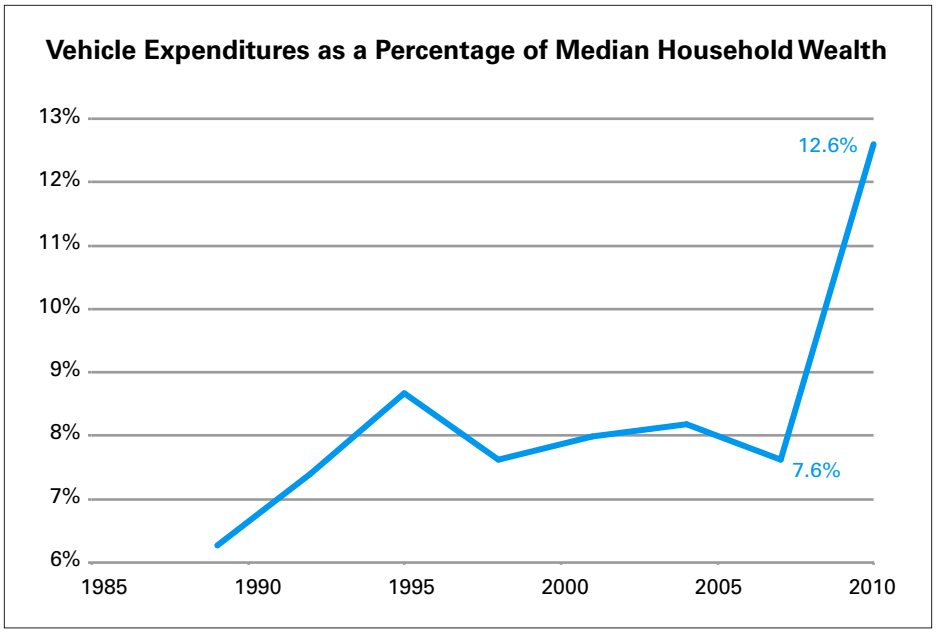
All consumers base purchase decisions upon a combination of two quantities: flow (income) and stock (savings). The following chart shows the purchase price of a vehicle versus the median income of a U.S. citizen over time:



This chart shows that for a household generating the median income, the relative price of a car has increased from under two-fifths of that income to three fifths of it within less than a generation. If flow was the only consideration, it is clear that a company targeting the middle class ("median" is the statistical middle) would be in trouble.

But flow is not the only consideration; (some) consumers have savings that is another source of purchasing power. Below is a graph showing the price of a car versus median net worth in the U.S.[1]

1. Net worth figures are quoted from a paper by Professor Edward Wolff of New York University entitled "The Asset Price Meltdown and the Wealth of the Middle Class" (August 26, 2012). Wolff draws his data from the Federal Reserve's Survey of Consumer Finances.



More bad news for a company targeting the middle class. The Great Recession of 2008 slashed the wealth of the middle class—most of which had been held in the form of real estate—to such an extent that, in "stock" terms, the price of a car nearly doubled for a median household over a period of three years (2007-2010).

American consumers—or at least the ones in the middle—are having a hard time paying the increasing price for convenience and mobility. This is not good news for an auto company built to serve the middle class.

Uncertainties

The auto business is a complex one with a great number of moving parts (literally and figuratively). Let's look first at uncertainties surrounding valuation drivers—revenues, profits, and balance sheet effects.

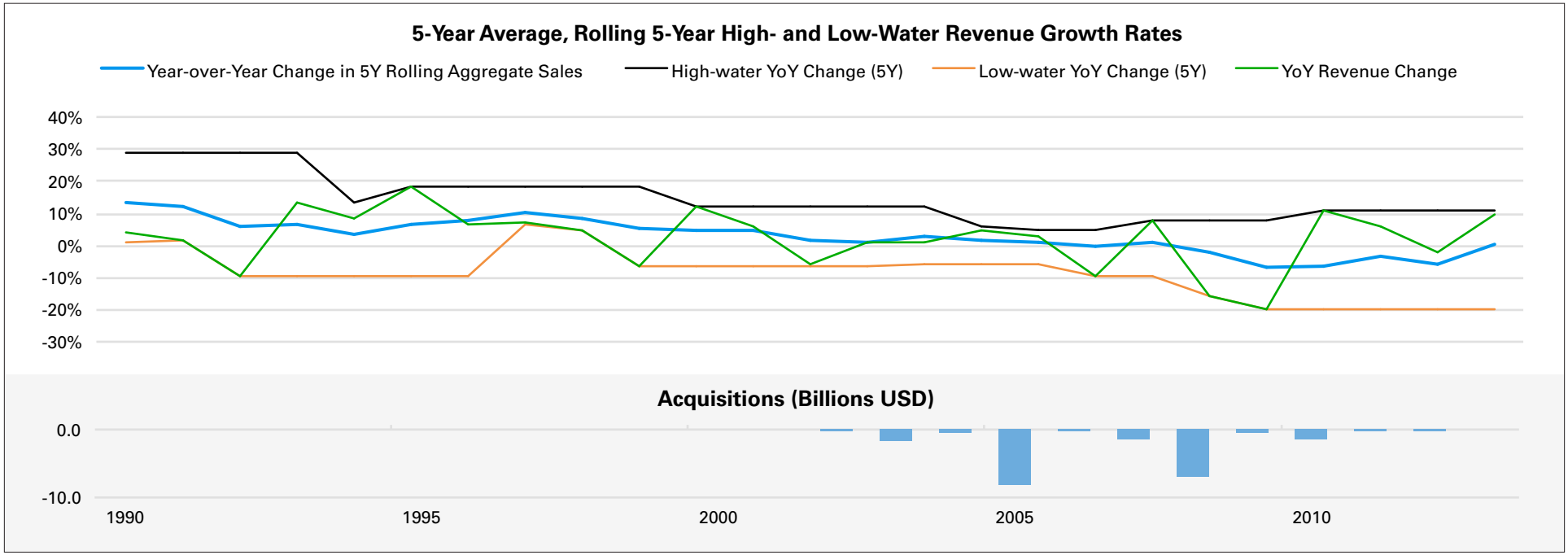
Growth of future revenues will largely depend upon the willingness and ability of the U.S. middle class to purchase automobiles (as discussed above) and to a lesser extent, to bettering conditions in Europe and Asia. Changes in wealth are fairly hard to predict since they largely depend upon the vagaries of markets. The trend regarding median income change does not look good for Ford, but there may be surprises—either positive or negative—here as well.

Considering the huge operational leverage in Ford's manufacturing business, profitability fluctuates based upon production and sales volumes, so an improvement or worsening of the macro environment has knock-on effects on profits as well. We discuss the effect of operational leverage more in the data commentary later in the report.

In addition to these uncertainties that directly affect cash flow, there is also a large "balance sheet effect" in the form of Ford's pension liabilities. Ford presently has unfunded pension obligations on the order of $10 billion; this underfunding implies a claim on cash that would otherwise flow to owners. If the equity market falls, the portion of Ford's pension exposed to equities (around 30% of the fund) will cause a further pension shortfall, and this will cause an increasingly large claim on owners' cash flows. Ford, thanks to actuarial adjustments, structural changes to its compensation package and pension investments, and increased funding to the tune of around $5 billion, has made a good deal of progress on shrinking its obligation, but owners should understand that the potential for uncertainty surrounding these obligations still exist.

Another uncertainty not directly related to valuation drivers, but which bears mentioning nonetheless is Ford's ownership structure. There are two classes of Ford stock, one of which exists to allow descendants of Henry Ford control of the company. Different analysts have different interpretations of the relative import of this type of ownership structure, and we believe it is difficult to say that dual-class shareholding is universally good or bad, but keep in mind that investing in Ford means that one will be basically investing in a closely-held family-run business.

Valuation Drivers: Revenues

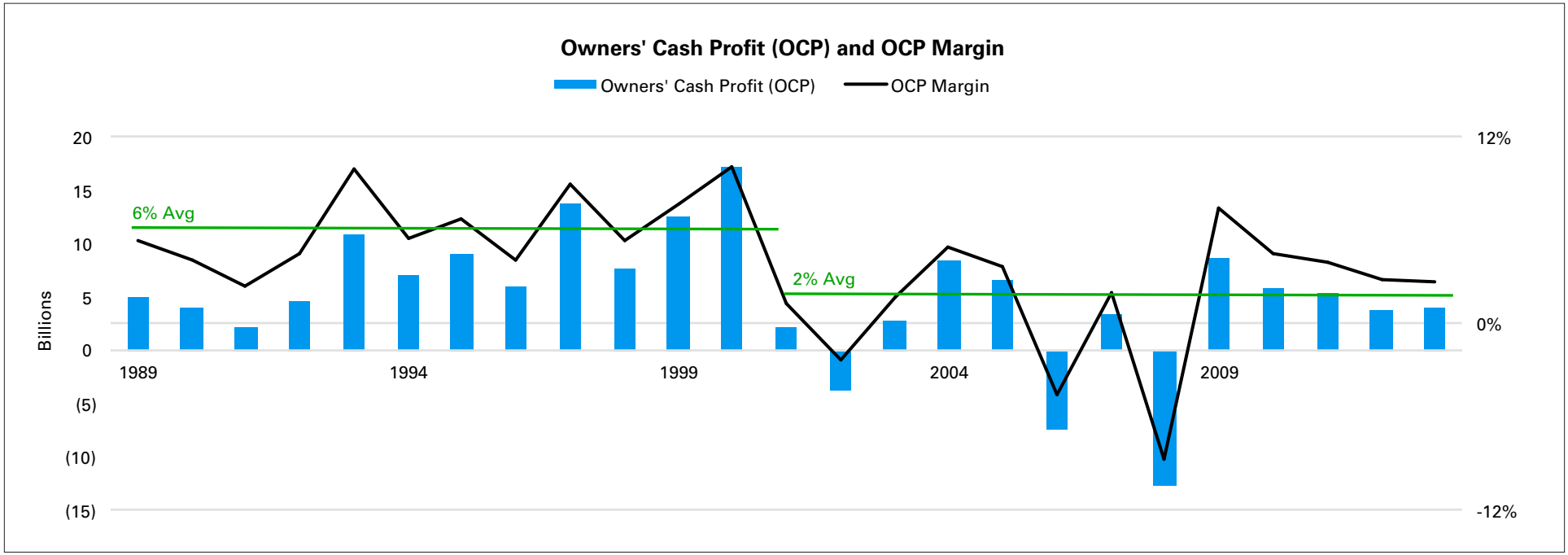


While Ford's year-over-year revenue growth has jumped around a bit due to cyclical factors, our preferred year-over-year change in 5-year rolling aggregate sales statistic has consistently been negative or very low single digits since 2001. The last mid-single digit increase was in 2000 (6%), at the tail end of the Clintonian economic boom.

Some of the revenue weakness has to do with the string of divestments Ford made during this time period (Visteon in 2005, Aston Martin in 2007, Jaguar and Land Rover in 2008, selling stake and ceding control to Mazda in 2008-2009).

Each page of the YCharts Focus Report focuses on a piece of the three fundamental elements that drive company valuations. Revenue growth is the first of these. Please see our detailed notes in the Methodology Section at the end of this report regarding this and the other drivers.

Valuation Drivers: Profitability

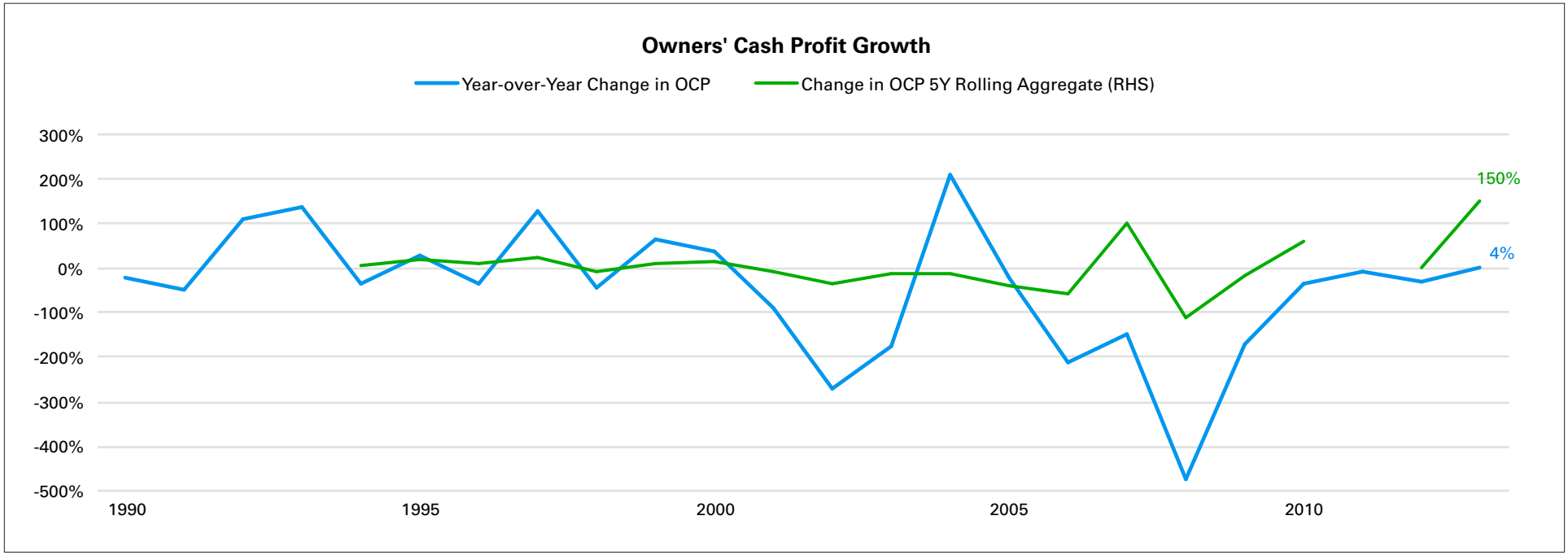


Not a great decade for Ford, profitability-wise. Like other car companies, in order to keep capacity utilization high in its plants, it offered incentives to buyers. These incentives covered the fixed costs of the factories, but little else. The incentives may seem irrational, but represent one edge of the double-edged sword of operating leverage. Even if a manufacturer generates net losses on the items it produces, as long as revenues are covering the fixed costs associated with production plants, it makes sense for the manufacturer to keep producing.

As a point of comparison, Toyota Motors TM generated an average OCP margin of 5.3% from 2001 to 2013 and an average 3.1% in the years 1990 to 2000.

Profitability—which we define as Owners' Cash Profits (OCP)—is the second of three fundamental valuation drivers. OCP is a cash-based measure equivalent to Cash Flow from Operations less a rough estimate of maintenance capital expenditures. Its calculation is an essential intermediary step to calculating Free Cash Flow to Owners. For detailed information regarding both measures, please see the Methodology Section at the end of this report.

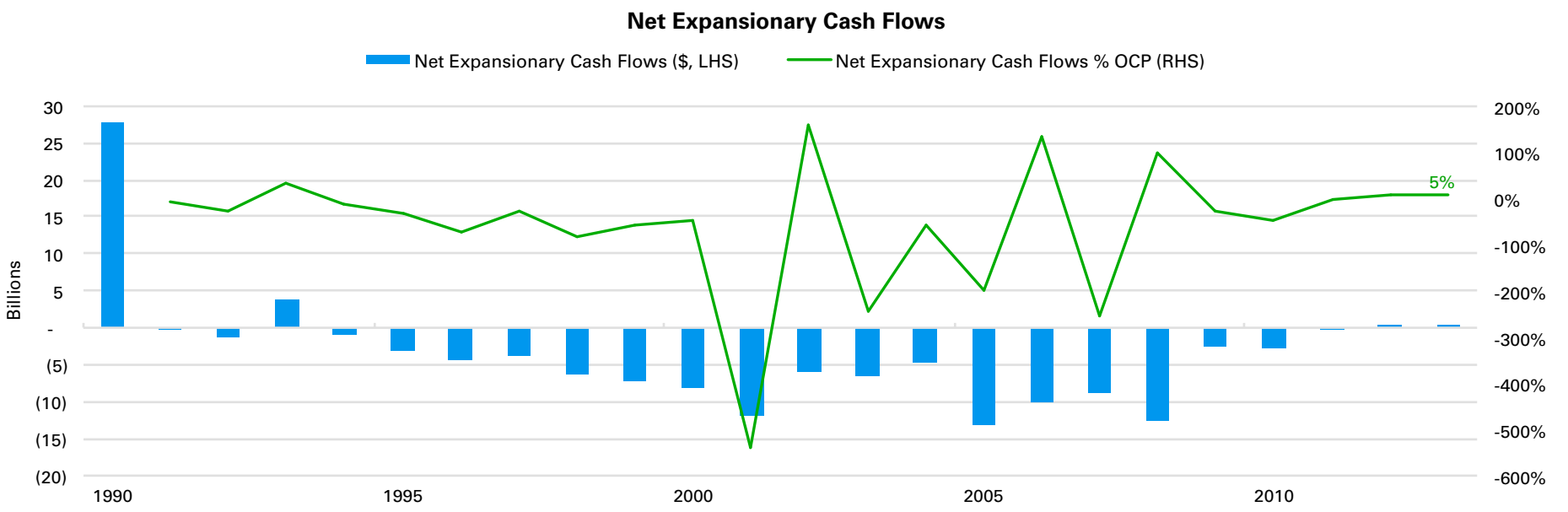
Valuation Drivers: Profitability (continued)



It is hard to make much sense out of an OCP growth rate for Ford. The profitability numbers themselves look as though they are the product of a random number generator, so the growth statistics are wonky. While we usually prefer to think of the effectiveness of a company's investment program, for Ford, it might be better to think of the effectiveness of its disinvestment program (more about that on the next page).

The largest proportion of a company's overall valuation is related to the projected growth rate of future free cash flows. Because free cash flows are a portion of OCP, it is vitally important to understand growth of OCP in order to develop a rational view of future free cash flows. For more information, please see the Methodology Section at the end of this report.

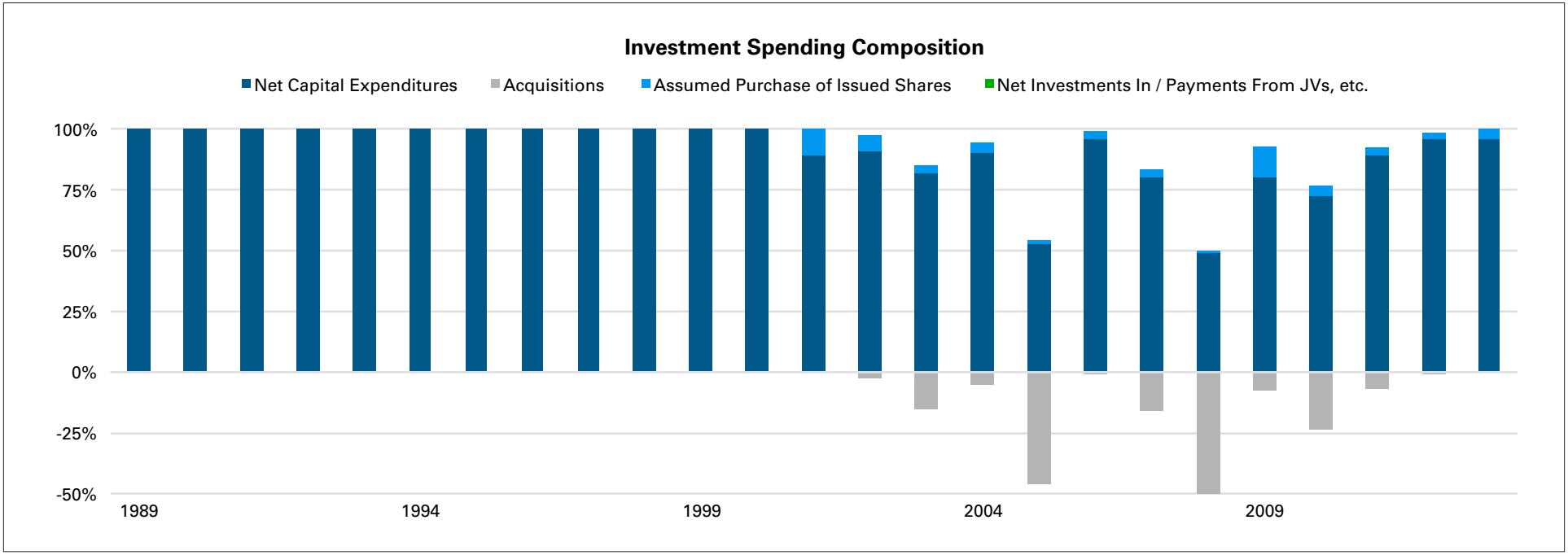
Valuation Drivers: Investment Level



Another crazy chart—two decades of negative expansionary cash flows. To understand this, recall that we define expansionary cash flows as all cash flows over and above our estimate for maintenance capital expenses (see the Methodology Section regarding the specifics). Ford had a massively outsized manufacturing base which created very high depreciation costs; these depreciation costs form the basis of our maintenance capex estimate. The good news is that the long period of disinvestment looks nearly over. Expenditures on PP&E are now roughly equal to depreciation expense, which means that the company is spending roughly the same amount on capital improvements as it costs to replace or repair equipment in place. Considering the lack of compelling investment opportunities for Ford in this area, we would hope that management would make as few growth-oriented investments as possible.

Expansionary spending is defined as all net cash outflows above what is necessary to maintain the firm as a going concern. In short, it is all capital spending above and beyond maintenance capex. From an owner's perspective, it is the portion of owners' cash profits a management team invests to generate excess growth of revenues and / or profits in the future. Please see details regarding the components of this measure and its rationale in the Methodology Section.

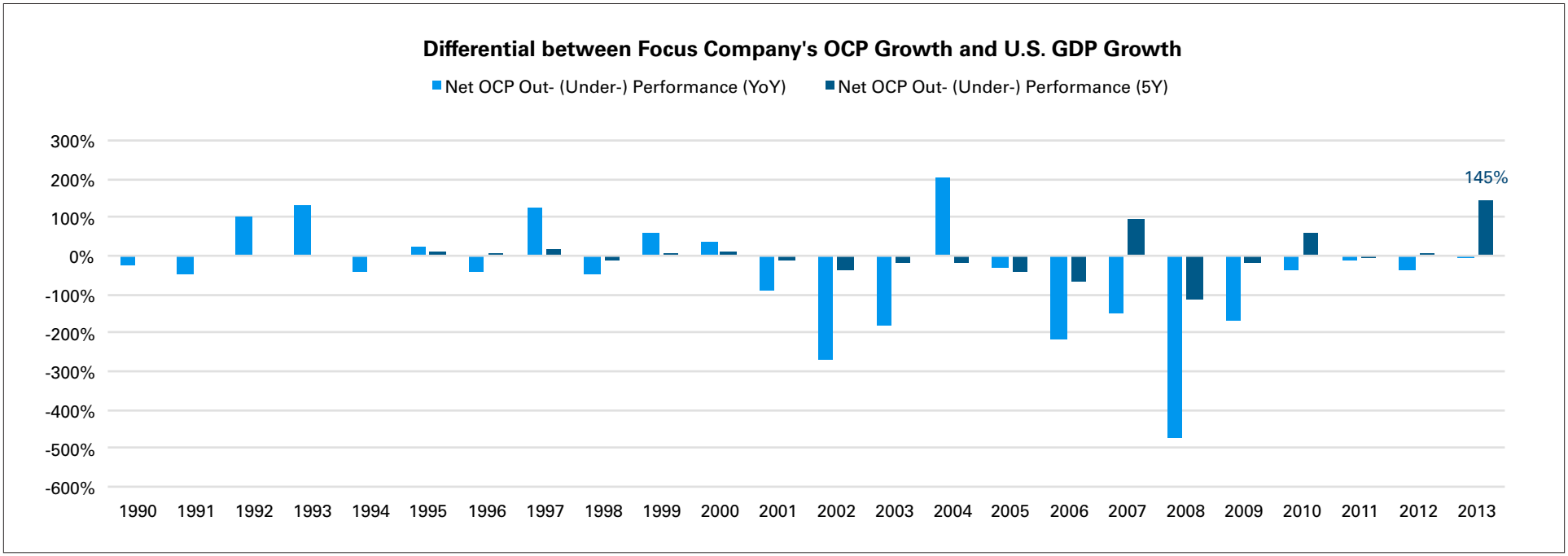
Valuation Drivers: Investment Level (continued)



We did not track investment composition pre-2000, but Ford's strategy is simple enough. Pay something in shares to keep engineers and managers motivated (notice that the biggest assumed expenditure happens in 2009) and the rest on equipment retooling while divesting what it is possible to divest.

The inclusion of "Assumed purchase of issued shares" in the Expansionary Spending category is explained fully in the Methodology Section at the end of this report.

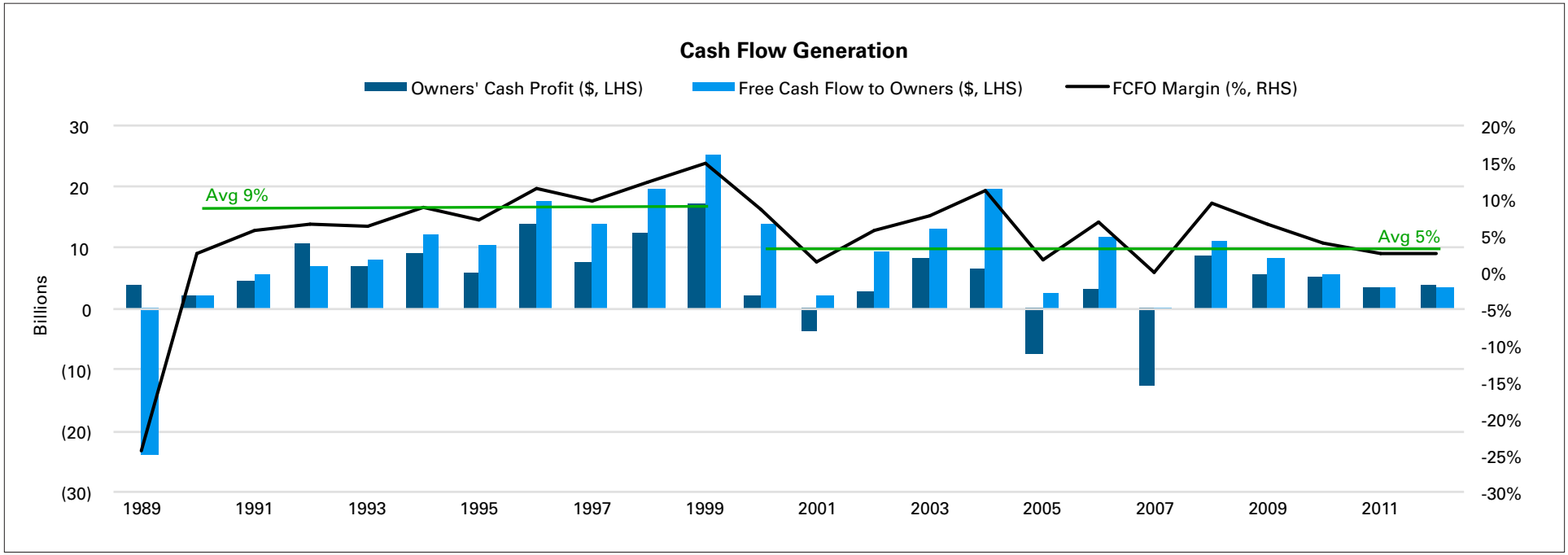
Valuation Drivers: Investment Efficacy



With the long process of divestment finally looking as though it is at an end, we believe these figures will start to have more meaning in years ahead. The last generation has been, in a very real sense, a transformational period for Ford that has seen several large competitors forced to restructure and / or receive government support. Ford's best chance for future growth comes from emerging markets, but only time will tell if its investments in those markets will have good efficacy.

This chart compares a company's growth in owners' cash profits to the nominal growth in the US economy over the same period. "Nominal" in this case means the growth in both activity (real GDP) and prices (inflation) in the economy. Please see the Methodology Section for more information regarding nominal GDP as a benchmark for corporate growth rates and determinations of company value.

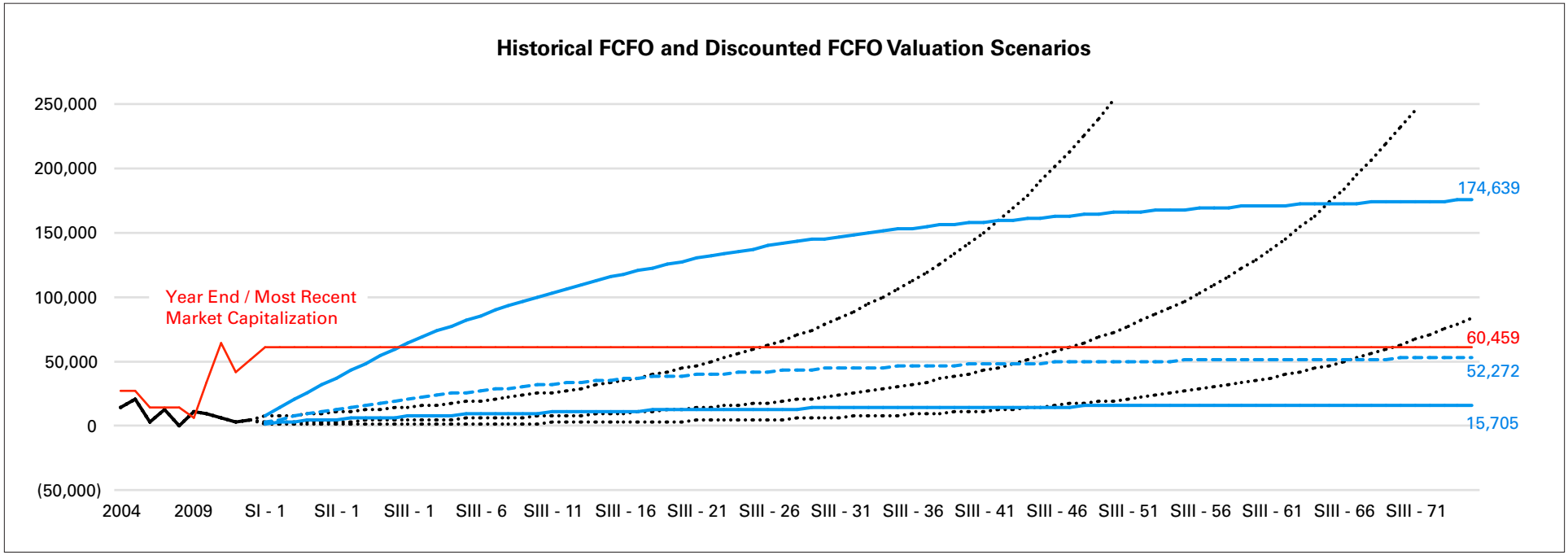
Cash Flow Generation



No surprise for a firm in the throes of disinvestment that free cash flow is higher than profits. We treat cash generated through divestments as being available to owners, so FCFO in the 2001-2013 period averaged 5% compared to 9% in the previous period (excluding 1990-1991). In the valuation section on the next page, our best case scenario assumes that Ford will be able to boost margins to roughly the earlier 9% level in the medium term.

This chart shows two proprietary measures—OCP and FCFO. Please see the Methodology Section for more information regarding our definitions of these measures and their impact on valuation.

Valuation



We used the following inputs, which are all based upon an analysis of the median, best, and worst-case values for the drivers mentioned earlier in this report.

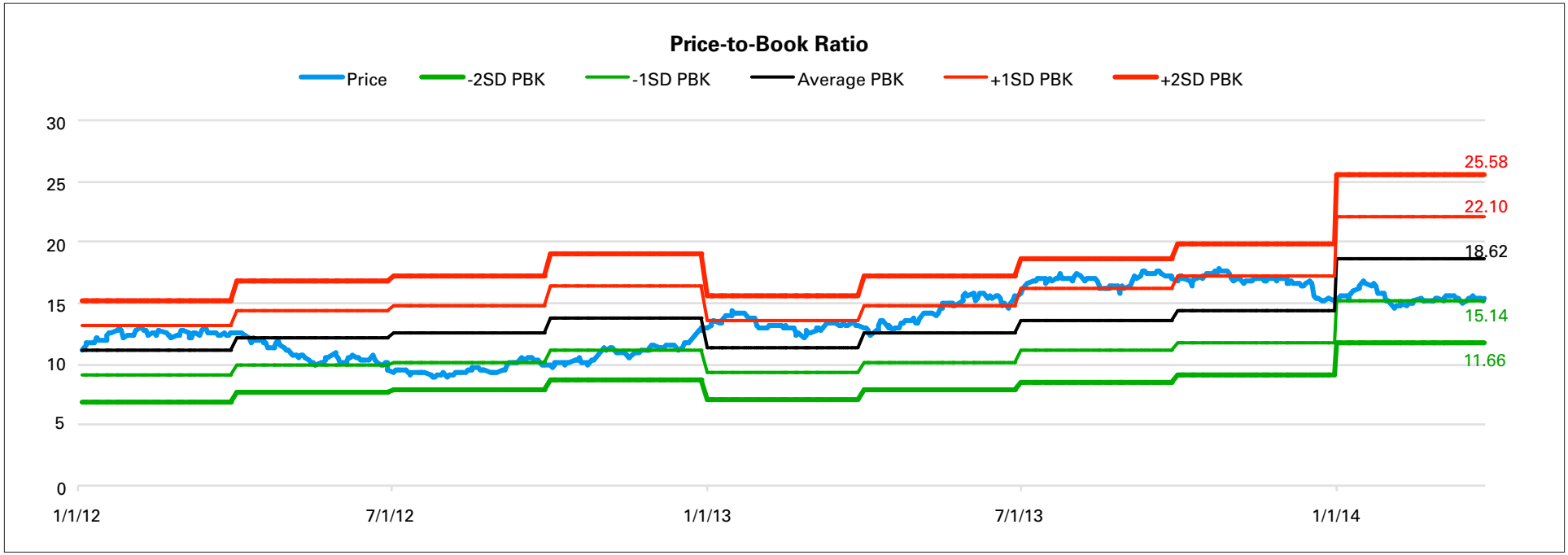
Valuation Assumptions & Scenarios

	Likely	**Worst**	Best
Revenue Growth	3%	-2%	6%
OCP Margin	2%	1%	5%
Expansionary % OCP	10%	20%	5%
Medium-term Growth	5%	0%	8%
Long-term Assumed Growth	-	-	6%
Discount Rate	-	-	10%

With these assumptions, we calculated a fair value range for the firm of $4-$44 with a median case valuation of $13 / share.

This diagram shows best-, worst-, and median-case scenarios of projected future free cash flows to owners (black dotted lines) as well as the aggregate present value of those flows (blue lines, median-case shown with a blue dashed line). The time frame used is 85 years, broken into three stages (marked SI-SIII). For more information about discounted cash flow analysis, please see the Methodology Section at the end of this document.

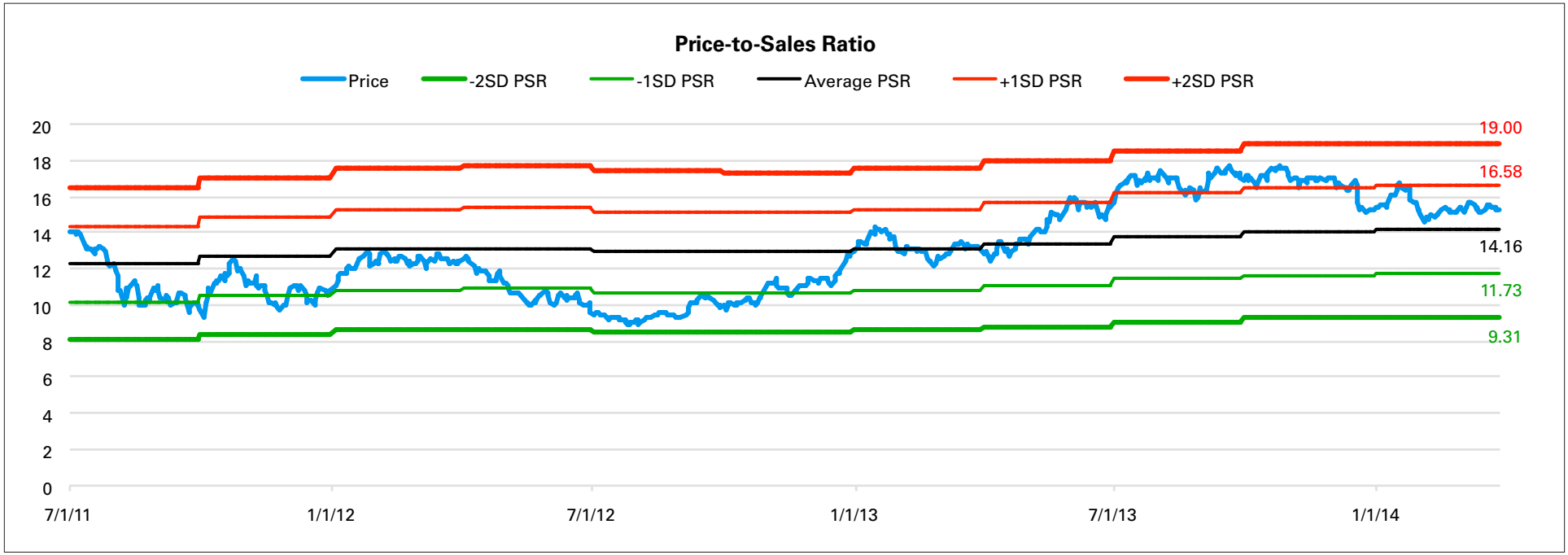
Market Multiples: Price to Book Ranges



If historical price-to-book relationships hold, the present price represents a good entry point and the low-$20 range a good exit point.

Valuation multiples can be used to triangulate attractive buy and sell levels for a company, but are best used in conjunction with profit-based valuation methods. Please see the Methodology Section for more information regarding the strengths and weaknesses of multiples analysis

Market Multiples: Price to Sales Ranges



The price-to-sales signal is shifted down in price slightly from the price-to-book one. If historical price-to-sales relationships hold, the present stock price is not the best to buy. According to this measure, one would look to buy at around the $10 mark and sell at around the $17 mark.

Please see note on previous page about market multiples.

Competitive Summary

Fundamental Data

Ticker	Name	Market Cap	Net Income (a)	Pretax Income (b)	EBIT (c)	Sales (d)	Assets (e)	Equity (f)
NSANF	Nissan Motor	36.9B	4.2B	5.3B	5.6B	109.8B	137.0B	43.1B
HMC	Honda Motor Co Ltd	62.5B	4.8B	6.5B	6.6B	115.8B	147.6B	54.9B
VLKAY	Volkswagen AG	72.5B	11.0B	15.7B	14.7B	255.2B	436.1B	118.5B
TM	Toyota Motor Corp	177.0B	18.5B	25.1B	25.3B	251.5B	384.7B	134.9B
GM	General Motors Co	55.0B	5.3B	7.5B	7.8B	155.4B	166.3B	42.6B
F	Ford Motor Co	60.5B	7.2B	7.0B	10.7B	146.9B	202.0B	26.4B

DuPont Analysis

Ticker	Name	Tax Burden (a / b)	Interest Burden (b / c)	EBIT Margin (c / d)	Asset Turn (d / e)	ROA (a / e)	Leverage (e / f)	ROE (a / f)
NSANF	Nissan Motor	0.79	0.95	5%	0.80	3%	3.18	10%
HMC	Honda Motor Co Ltd	0.74	0.98	6%	0.78	3%	2.69	9%
VLKAY	Volkswagen AG	0.70	1.07	6%	0.59	3%	3.68	9%
TM	Toyota Motor Corp	0.74	0.99	10%	0.65	5%	2.85	14%
GM	General Motors Co	0.71	0.96	5%	0.93	3%	3.90	12%
F	Ford Motor Co	1.03	0.65	7%	0.73	4%	7.65	27%

All “flow” numbers represent trailing twelve-month (TTM) quantities.

Competitive Summary (continued)

Cash Flow Measures

Ticker	Name	Dep / Amort	Change in NWC	TTM CFO	TTM CFO Margin	TTM FCF	FCF Margin	Dividend Yield
NSANF	Nissan Motor	6.1B	-4.4B	6.6B	6%	-2.2B	-2%	2.9%
HMC	Honda Motor Co Ltd	6.3B	-0.9B	10.6B	9%	-5.6B	-5%	1.0%
VLKAY	Volkswagen AG	17.4B	-15.8B	16.3B	6%	2.4B	1%	1.7%
TM	Toyota Motor Corp	11.7B	2.5B	31.7B	13%	7.9B	3%	2.2%
GM	General Motors Co	8.0B	NA	12.6B	8%	5.1B	3%	3.5%
F	Ford Motor Co	6.5B	NA	10.4B	7%	3.8B	3%	3.3%

Multiples and Misc.

Ticker	Name	PS Ratio	PB Ratio	EV / EBITDA	P/E Ratio	P/FCF	Altman Z-Score	Beta
NSANF	Nissan Motor	NA	0.9	10.5	9.5	NA	1.8	0.83
HMC	Honda Motor Co Ltd	NA	1.1	10.5	13.0	NA	2.1	1.07
VLKAY	Volkswagen AG	0.3	0.6	8.0	NA	29.8	NA	1.37
TM	Toyota Motor Corp	0.7	1.3	10.0	9.6	22.5	1.8	0.82
GM	General Motors Co	0.4	1.4	4.1	24.6	11.2	1.7	1.69
F	Ford Motor Co	0.4	2.3	7.5	8.7	16.3	1.7	2.54

All “flow” numbers represent trailing twelve-month (TTM) quantities.

Methodology

Introduction

This report covers three topics: Valuation, Market Pricing, and Competition.

Valuation

The majority of YCharts' 1% Focus Reports deal with valuation. Our base assumption is that the value of a firm is proportional to the cash that flows to its owners over its economic life. Considering this definition, there are only four factors that drive the valuation of any firm:

1. Revenue Growth	Affects short-term results
2. Profitability	Affects short-term results
3. "Investment Efficacy"	Affects medium-term growth
4. Balance Sheet Effects	Hidden assets and liabilities

Market Pricing and Competition

A portion of the YCharts 1% Focus Reports deal with market perception of value and operational comparisons to the focus firm's competitors.

The long-term value of a firm sometimes deviates from its publicly-traded price. To provide an aid in triangulating the present market price of a stock to its long-run value, YCharts' 1% Focus Reports provide information about market multiples over recent history as well as summary information about the Focus company's competitors.

Valuation Drivers

What is the value of an asset?

Let's start with a simple asset: a hammer. One can buy a good, sturdy hammer on the Home Depot HD website for roughly $30.

The price of that hammer is fixed, but its value depends on how it is used. A good carpenter would use that hammer to generate revenues.

If those revenues generate profits over and above his cost of living, he can generate some savings.

With enough savings, the carpenter may be able to invest in better equipment that will allow him to generate revenues more quickly or to become more efficient at covering his living and business expenses.

The value of the hammer could, in the right hands, be worth much more than its $30 price.

No matter how complex an asset is—whether it has no moving parts like a hammer, thousands of moving parts like a machine, or thousands of patents like a modern tech company—the essence of valuation does not change.

Focus reports aim to uncover the drivers of value common to all companies and all assets. To have value, an asset must be able to generate revenues greater than costs incurred. The profits from this process can either be distributed to owners or re-invested in the business. If profits are re-invested successfully, the company will grow at a good clip into the future. If profits grow at a good clip into the future, more cash inflows will accrue to owners.

The Focus Report whittles down on each level of this process to bring readers to a modified form of Free Cash Flow to Equity that we call "Free Cash Flow to Owners (FCFO)." Please find detailed explanations of each valuation driver and the resultant valuation measure in the below sections.

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Benjamin Graham once observed that over the short term, the market was a voting machine but over the long term, it was a weighing machine. The goal of YCharts' 1% Focus Reports is to highlight the "weight" of a firm.

Reading through, please keep the sage advice of Warren Buffett in mind: "It's better to be approximately right than precisely wrong." It is in this spirit that we have designed this report.

Revenue Growth

The road to value starts with revenues. Our carpenter's hammer is only a novelty purchase if he cannot use that hammer to generate revenues.

Revenue growth is constrained by both supply and demand factors.

After a hurricane, the carpenter's skills are going to be in great demand. His revenues will increase because he can charge more for his services[1], but his capacity to generate revenues is limited by his small capital base—one hammer. This is an example of how supply factors can limit revenue growth and is typical for a small firm operating in a robust demand environment.

The carpenter may be able to get outside funding to increase the size and / or efficiency of his capital base and in so doing, will realize fewer supply-side constraints to revenue growth. However, after the initial post-storm building boom, the carpenter's business is likely to face more demand constraints to revenue growth than supply-side ones. Demand for his services from local homeowners is simply not as strong after most people's houses are repaired.

Public companies also reach the point at which their revenues cease to be supply-constrained and are begins to be demand-constrained.

This is what Nike's NKE Phil Knight said about his company's transition from supply- to demand-constraint in a 1992 Harvard Business Review article[2]:

The road to value starts with revenues... Revenue growth is constrained by both supply and demand factors.

> [HBR:] "When did your thinking [about business strategy] change?"
>
> [Bill Knight:] "When the formulas that got Nike up to $1 billion in sales—being good at innovation and production and being able to sign great athletes—stopped working and... Reebok came out of nowhere to dominate the aerobics market."

Nike's ability to supply products to consumers was not a constraint to its revenue growth. Rather, demand for a competitor's products cut into demand for Nike's, and this dynamic constrained revenue growth.

In a demand-constrained environment, our carpenter might decide to spend more on advertising to win more clients (which affects profitability—our next valuation driver), or might choose to acquire a similar business with a well-defined client base of its own. For instance, our carpenter might take out a loan or use his business's excess profits to buy a wholesale building products distributor.

This strategy, sometimes referred to as "buying revenues" is, of course, common in the world of listed companies as well. And while some investors look down on these kinds of transactions, as long as the company is not overpaying for its acquisitions, acquiring a new revenue stream by buying a business is as "valid" a strategy as acquiring a new revenue stream by building it.

Phil Knight's comments regarding Nike's purchase of casual shoe company Cole-Haan in the same HBR article quoted above are telling:

> "We bought the brand knowing its potential... We could have created a brand and got it up to $60 million in sales, which is where Cole-Haan was when we bought it, but it would have taken millions of dollars and a minimum of five years."

It should be obvious from this discussion that revenue growth is inextricably linked with capital expenditures and other "expansionary outflows"—such as acquisitions—which is why Focus Reports show revenue growth overlaid with the amount of money spent on acquisitions.

We will look more at how to assess whether acquisitions and other expansionary cash flows are good for owners or not when we look at Investment Efficacy.

For now, let us turn to the second driver of value: profitability.

Profitability

Most of the measures of profitability drawn from Income Statements and widely used on The Street have little meaning to our carpenter and his business. He cares about how much cash his business generates in a year, not how the rarified, polite fictions embodied in Generally Accepted Accounting Principles (GAAP) rules view his growing firm's profitability.

Investors would do well to look at investing from a cash perspective as well since cash is the single accounting line item with the least amount of "fiction" in it. Cash balances are easy for auditors to count and verify and, unless you are living in a hyperinflationary economy, the purchasing power of cash is well-defined and stable.

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1 Revenues are proportional to price and volume. In this instance, volume is fixed, but price rises for an overall rise in sales level.
2 Willigan, G. E. (1992, July-Aug). High Performance Marketing: An Interview with Nike's Phil Knight. HBR, 93-101.

It is for this reason that our view of profitability is based on a line item on the Statement of Cash Flows rather than on the Income Statement. Namely, we base our measurement of profit on Cash Flow for Operations.

In terms of Financial Statement accounts, the specific calculations we use are:

	Cash Flow from Operations (CFO)
Less	Estimate of Maintenance Capital Expenditures
Equals	"Owners' Cash Profits (OCP)"

CFO is self-explanatory, but "Estimate of Maintenance Capital Expenditures" deserves explanation.

Revenue growth is inextricably linked with capital expenditures and other "expansionary outflows"—such as acquisitions...

In order for our carpenter to maintain his company as a viable economic entity, he must make sure the tools his employees use and the warehouse in which he keeps his supplies are maintained at a level at which they can continue to generate revenues.

Using only cash-based CFO as a measure of profitability—which is, in fact, one step better than relying on a figure like the widely-misused "EBITDA"—would vastly overstate a firm's profitability. CFO overstates profitability because it does not reflect any future payments that must be made for maintenance of revenue-producing capital goods.

Like our carpenter, we as analysts cannot be sure of what cash will be required to maintain a business's capacity to continue generating revenues. Cognizant of the fundamental uncertainties involved, and in keeping with our attempt to be "approximately right rather than precisely wrong," we estimate the required amount of maintenance capital expenditures to be Depreciation Expense adjusted for inflation.[3]

The amount of cash a company generates from its operations less the amount of cash it will probably need to spend to maintain its operations in the future is our preferred measure of profitability. Once we calculate this measure—that we call "Owners' Cash Profits (OCP)"—we are one step closer to the Free Cash Flow to Owners measure needed for valuation. The next step in the process is to see how much cash the firm is spending in excess of maintenance levels to expand the business at a faster rate—what we term "Expansionary Cash Flows."

Expansionary Cash Flows and Investment Efficacy

Our carpenter started the year with an empty bank account and, after paying himself and his employees a salary, paying for supplies and inventories, paying interest on any loans taken out, setting aside money for taxes and equipment maintenance, and doing all the other things necessary to keep his business going, he has a nicely positive balance at his local bank branch.

What does he do with those excess profits? The answer to that question will necessarily determine the future of the firm.

Our carpenter has two choices:

1. Reinvest left over profits in the business
2. Pay himself—the owner—a bonus out of profits

If he invests in projects that bring him greater revenues (geographic or business line expansion) or helps his company convert revenues to profit more efficiently, his future profits will be boosted. If he invests in projects that fail to increase revenues, or in those that increase revenues in an uneconomic way—meaning profits drop even as revenues increase—his future profits will dip.

If he pays himself a bonus out of profits, but otherwise runs his firm efficiently, his company's profits will likely continue growing "organically" from periodic price rises and new customers learning about his services; however, profits will not grow as quickly or reach as high a level if he were actively and successfully investing in the business.[4]

Since our base assumption is that the value of a company is proportional to the cash it generates on behalf of its owners it is obvious that profit growth will have a huge impact on valuation.

Before discussing how to measure and assess "expansionary" investment cash flows, let us look more closely at growth rates.

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3 As a wonkish aside, we are trying to isolate the amount of cash that will be necessary to maintain the basic operations of the company, so we exclude any Amortization charges related to bond discounts, intangibles, etc. if these are split out in the company's financial statements.

4 The one other possible use of excess profits is what we consider "wasting" it. For example, one of the first mortgage brokers to go bankrupt in 2007 was one that had spent its excess profits on building a new headquarters building with an atrium entrance featuring a waterfall decorated with a tile mosaic portrait of the founder behind it. This mortgage broker went the way of all firms that consistently waste resources...

There is virtually no limit to our carpenter's business's early growth. If his services and products are compelling, and solve problems other carpentry services and products do not, his company will expand locally, regionally, nationally, and globally—limited only by his access to capital to fund the expansion. Think of Google GOOG as an example—its products were so compelling that it went from little more than a graduate school science experiment to one of the largest, most profitable corporations on earth in a decade and a half—despite two downturns of various severity in the interim.

However, if our carpenter is as successful as Google, eventually, he will have soaked up all available demand for carpentry services and squeezed every bit of efficiency out of his operations as possible. At this point, his company's profit growth will slow.

The easiest and most powerful method we have found to analyze a company is to conceive of its future growth as being bucketed into three separate stages: near-, medium-, and long-term.

Near-term, growth of profits will vary according to dynamics related to the competitive environment. To put it in the context of our carpenter—how many people need carpentry services and how many other carpenters are there in the area.

Medium-term, growth of profits will depend on the success, failure, or absence of expansionary projects and organic growth in the core business. For our carpenter, this means whether or not his purchase of the distributor is successful or if he plays it safe and uses excess profits to take a Caribbean cruise.

Long term, a large firm's growth is constrained ultimately by how fast the economy at large can grow. For most carpenters, this relates to the growth of new home construction and home remodeling in their local areas.

These stages and the value generated in each can be represented graphically, as we see in FIgure 1 to the right. Here, we are assuming the company's growth will fluctuate in the near term based on our projections of its revenue and profitability (marked by "Explicit forecast" in this diagram), that it will grow quickly for five years in Stage 2 based on assumed success of its investments, and that after its high-growth period, it will grow at a more or less constant rate equal to nominal GDP after that.

Note that even though future cash flows keep growing at a constant rate into the future, because the present value of those far-distant future cash flows is low[5], their discounted value approaches an asymptote at around $1,200.

It is obvious that if we are to assess the value of the Stage 2, high-growth period, we must first find a way to quantify how much of the owners' profits the firm is spending on expansionary investments.

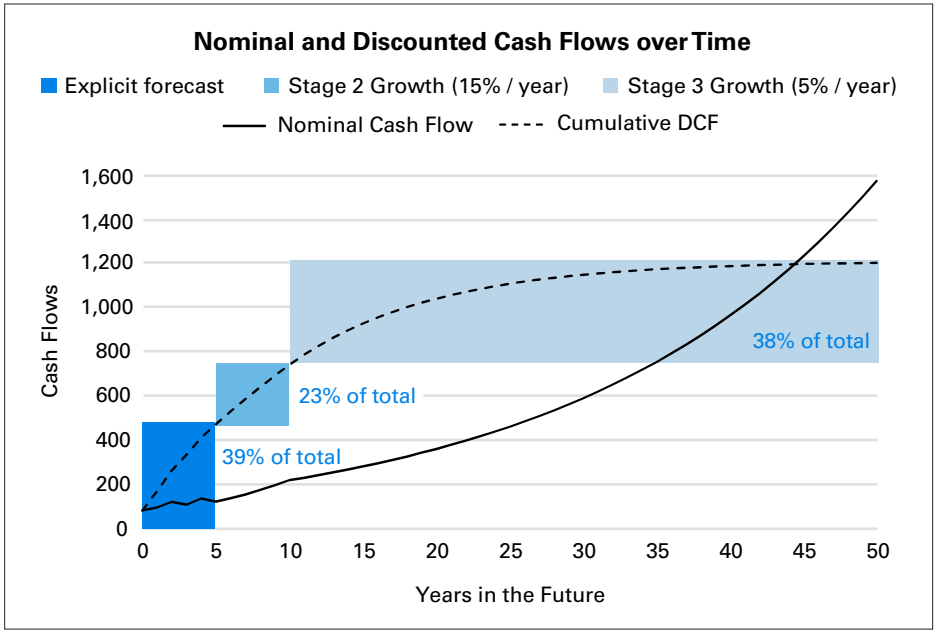

Figure 1.

Measuring Expansionary Cash Flows

People normally think of business reinvestment in terms of capital expenditures. Indeed, this is a valid way to think about investments for manufacturers in a fairly stable competitive environment (like our carpenter).

However, in these days of globalization and rapid technological innovation, we believe "Capex" fails to cover all the cash outflows made by large firms to expand their businesses at a rate faster than the economy at large.

Once these outflows are taken into account, any cash left over is free to be distributed to owners. It is this "Free Cash Flow to Owners (FCFO)" to which we assume companies' values are proportional.

5 Due to the theory of time value of money (TVM).

The formula we use to calculate investments and FCFO is:

	Owners' Cash Profits
Less	Capital Expenditures over and above Maintenance Needs
Plus	Cash Inflow from Asset Sales and Disposals
Less	Cash Loaned to JVs, Software development, etc.
Less	"Mandatory" Stock Buybacks
Equals	"Free Cash Flow to Owners (FCFO)"

All line items between OCP and FCFO are what we consider as Expansionary Cash Flows.

Recalling that our estimate of economic profit already has an estimate of maintenance capital expenses calculated in it, we can see that the first three lines above are simply the standard definition of Free Cash Flow to Equity Holders (FCFE); namely FCFE = OCF less net spending on PP&E.

Let us look at the other lines, one by one.

Our carpenter might decide to expand his distribution business by opening a new branch in the neighboring state. In order to run this business effectively, he forms a joint venture (JV) with a local businessperson and provides capital to that JV. Clearly, this is a cash outflow made with the purpose of expanding the carpenter's business. It might be a stretch to imagine, but perhaps our tech-savvy carpenter sees the opportunity to hire a programmer to write some inventory management software that will make his business more efficient. Because an increase in efficiency implies a greater amount of future profits being realized, we should also count this sort of investment as an expansionary cash outflow unavailable to distribution to owners.

In these days of globalization and rapid technological innovation, we believe "Capex" fails to cover all the cash outflows made by large firms to expand their businesses at a rate faster than the economy at large.

While these measures are pretty straight-forward, the "Mandatory" Stock Buybacks line item requires a bit more commentary.

Over the past 20 years, companies have increasingly turned to stock buyback programs to "return value to shareholders." Management teams are supported by academicians, who have proved through elegant mathematical reasoning that since managers have inside information about the future prospects of the firm, their purchases of stock on behalf of shareholders must always be value creative.

Indeed, to the extent that stock repurchases increase the proportional stake of an owner in the company, they can, in a certain sense, be thought of as value creative. However, one dirty little secret about stock buybacks is that in most cases, a material proportion of buybacks are going not to increase present owners' proportional stake, but rather to soak up dilution caused by management's granting its employees stocks as a part of their compensation package.[6]

By using equity grants as a form of worker compensation, upper management is essentially funding a portion of its operating costs through dilutive stock issuance. By buying back those shares, it is using cash flow that would otherwise become shareholder wealth to obfuscate this compensation scheme and keep earnings per share (EPS) from falling or stagnating.

It would be nice if we could tie this phenomenon to something a small businessperson like a carpenter might do. However, this is an "innovation" that most small businesspeople do not use for one obvious reason: Owners of a closely-held company would likely not see any sense in doing it. A large corporation can get away with it because, frankly, many of its owners are not paying close enough attention.[7]

It is a toss-up as to whether this spending on anti-dilutive stock buybacks should be treated as a deduction from owners' cash profits or a reduction of FCFO. Because the stock grants

6 There are other dirty little secrets that are well-documented, such as the fact that management teams, which are allegedly super-investors in their own company's stock given their insider information, still tend to purchase more shares when the stock price is relatively high, and less when the stock price is low. While it is impossible to deny that an increase in proportional share of the company is good for shareholders, it is hard to believe that managements consistently do a good job of investing in their own company's stock.

7 There may indeed be some cases in which a small businessperson, in the attempt to conserve cash in the short term, would compensate a lawyer or accountant by promising a share of the business's future profits. It would also be likely that a small businessperson in this situation would attempt to pay off the professional fees in cash as soon as he had cash to cancel the ownership claim. But the thought that a small businessperson would attempt to obfuscate this transaction when presenting financial results to his partners is hard to imagine.

are given as a way to meet operating costs, it could be counted as the former. However, one could make the argument that granting shares in lieu of cash encourages employees to work hard and creatively in order to generate superlative growth.

In the end, though, the difference is academic since the result is the same—a reduction in the cash flow available to be distributed to owners. We calculate the cash outflow associated with these anti-dilutionary purchases as the number of shares issued multiplied by the average share price during the year.

Now that we have an "approximately accurate" view of how much the firm is spending to boost its future growth, the next task is to find an objective measure of how effective its investment strategy is.

Estimating Investment Efficacy

Assessing the success of a professional money manager, it is typical to measure the degree to which the manager's investments over- or under-performed some benchmark over time. Warren Buffett's investments have consistently outperformed those of the S&P by a wide margin over an extended period of time, so we recognize Buffett as a great investor. Surely, companies that invest in expansionary projects can also be assessed relative to success vis-à-vis some benchmark.

Assessing the success of a professional money manager, it is typical to measure the degree to which the manager's investments over- or under-performed some benchmark over time... Surely, companies that invest in expansionary projects can also be assessed relative to success vis-à-vis some benchmark.

Thinking back to our prior discussion of growth stages, it is obvious that long-term, a company cannot grow faster that nominal GDP. It makes sense then, to use nominal GDP as a benchmark for growth during the high-growth, "Stage II" period.

Now, we have a benchmark, but against which quantity—growth of OCP or growth of FCFO—should we compare it?

Our preference is to compare growth of Owners' Cash Profits to nominal GDP for the following reason:

FCFO is a quantity that is influenced by other investment decisions, so the number tends to be very noisy. For example, let's say our carpenter invests 10% of his cash profits in a new piece of equipment at the end of year 1; this equipment improves his workers' efficiency so much that he is able to generate a huge amount of excess profits over the next year. He has such a surfeit of cash at the end of year 2, that he decides to make a stretch purchase of a new distributor and spends 100% of his cash profits on it. It is clear that the year 1 investment was good for his company, but if one looked at it in terms of the FCFO in year 2—which is $0, because he spent 100% of Owners' Cash Profits on the distributor—it would look like a terrible investment.

Note also that business investments often take several years before their full impact on cash profits are felt. As such, we consider investment efficacy as a valuation factor that influences medium-term growth rates.

By benchmarking growth in Owners' Cash Profits to nominal GDP, we are implicitly making the assumption that, at the end of the company's high-growth period, the managers will be sage enough to return profits to owners rather than embarking on value-destroying investment projects. Depending on the firm and the industry, this might be a pretty big assumption to make, but investors are suspicious of management teams' ability to act as sage stewards of owner capital can lower their "high-growth" growth projections to compensate.

A firm that has plenty of good investment opportunities—say one that is a leader in an emerging industry—and is skillful at choosing the best ones in which to invest, will be able to grow at a rate much higher than nominal GDP for a long time (e.g., 10 or 15 years after the initial 5-year "explicit" Stage I period).

A firm that has middling investment opportunities may be able to grow faster than GDP, but not significantly and not for as long. A company with a mature business in a stable competitive environment will return most of its cash profits directly to owners, so should be able to grow at about the rate of GDP—maybe a few points higher one year and a few lower the next.

Looking at growth stages from this perspective and tying value creation to each growth stage in this way makes it much easier to come to an objective opinion regarding the company's value.

After understanding the level of investment spending and its efficacy, we turn to the value created or destroyed by "hidden" assets and liabilities—Balance Sheet Effects.

Balance Sheet Effects

Let's say our carpenter, after becoming very successful in his own trade and as a distributor, decides to expand into the taxi business. He buys two used cars for $20,000 each as his

primary operating assets for this, the newest division of his burgeoning economic empire. The cars are used, so he decides to clean them out before putting them into service.

While he is cleaning out the first car, he finds a tightly-wrapped brown package in the spare tire well and, upon opening it, is surprised to find that the package conceals a large quantity of illicit drugs. Reporting his find to the police, the police impound the car as evidence and tell him they cannot give him an estimate of when it will be returned.

In the parlance of accountants, our carpenter's operational asset has become impaired by a non-operational contingency. In plain terms, he can't use his car to make money. Since revenues will decline, the value of his new taxi cab division has necessarily declined.

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Disappointed about the indefinite loss of one car, he grudgingly starts cleaning out the second one. As he is vacuuming between the seats, he finds a lottery ticket. He goes to claim the lottery ticket and finds it is worth $500,000.

In the parlance of accountants, his operational asset has had a material upward revaluation. In plain terms, his new taxi cab division is his company's newest unexpected rain maker. The after-tax winnings from the lottery ticket are pure, unanticipated profit for his taxi division and hugely increase its value and the value of the firm.

Unlike the drivers of valuation mentioned earlier, these "balance sheet effects"—the hidden assets and liabilities controlled by a firm—are difficult to find with data alone. Instead, it usually requires an in-depth understanding of the company, accounting rules, and, in some cases, legal matters (think Enron or Lehman Brothers).

Because balance sheet effects are difficult or impossible to find by looking only at reported financial data, YCharts Focus Reports cannot directly highlight these drivers of value. However, the long history of data we display and the clear manner in which we do it should point the curious and intelligent investor to areas in which to investigate further and uncover them themselves.

Historical Multiples

See also the notes on YCharts' site entitled Valuations from Historical Multiples.

While the drivers to corporate valuation are as listed above, the inherent imprecision of attempting to forecast economic outcomes for as complex an entity as a modern multinational firm means that it is helpful to use alternate metrics to triangulate our intrinsic value calculations.

One oft-used method for both screening a large universe of stocks for attractive investment opportunities and triangulating intrinsic value calculations is what is known as the historical or market multiple. Common examples include the price-to-earnings (P/E) ratio, price-to-sales ratio (PSR), and the like.

The idea behind multiples is that the price per unit of some financial statement quantity should, in general be relatively constant, or at least that it should return to normalized levels over time.

There is academic evidence of the success of at least one of these multiples (Price-to-Book ratio), but attempting to use historical multiples as a sole tool to value equities is a method fraught with conceptual difficulties.

The most important thing to realize about market multiples is that differences in capital structure, business model, geographical exposure, and other factors can make the direct comparison of multiples across companies difficult.

In order to compare one company to another on an apples-to-apples basis, one must factor in operational and capital structure differences; this often requires a great deal of detailed information about the company and a firm understanding of arcane accounting rules and concepts.

Even comparing a single company's multiples versus previous historical periods is difficult, since companies often change their capital structures over time, buy and sell off divisions, and the like.

In general, it is important to realize that unlike physical constants, there is no rule that a certain company's multiple cannot fall below a certain level. Apples fall to the earth at 32 feet / sec^2, neglecting wind resistance. Stocks conform to no such physical constants.

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