

A reader sent me an email asking me **why the company shown in [my blind stock valuation contest](#) has free cash flow that's so much lower than reported earnings.**

Let's look at something [Warren Buffett](#) said in [his 2009 letter to shareholders](#):

*“Our BNSF operation, it should be noted, has certain important economic characteristics that resemble those of our electric utilities. In both cases we provide fundamental services that are, and will remain, essential to the economic well-being of our customers, the communities we serve, and indeed the nation. **Both will require heavy investment that greatly exceeds depreciation allowances for decades to come....**”*

Without giving too much away, the mystery company in [the blind stock valuation exercise](#) fits that description.

But why does any company fit that description?

Why would a company require capital spending *“that greatly exceeds depreciation allowances”* not just for one year or two but decade after decade?

The answer is **inflation**.

Now, before I get into illustrating why railroads all vastly overstate their true economic earnings, I want to stress that this overstatement is not caused by fraud or management's desire to mislead. If investors are misled, it's only because they look at the P/E ratio without looking at free cash flow.

It is well known that railroads can't pay out all their earnings in dividends. The big reason for this is that some of those stated earnings are completely illusory.

It's an earnings mirage.

This railroad earnings mirage come from a continual gap between capital spending and depreciation. Year after year, railroads spend more on new property than they count as a replacement expense. In other words, the “upkeep” expense at railroads is vastly understated. This causes vastly overstated earnings.

Railroads depreciate against the original cost of their old assets. But they replace their old assets with new assets. Because of inflation, replacing any asset bought or built in 1991 with an identical one in 2011 will cost more money.

Depreciation doesn't adjust for cost inflation.

Obviously, inflation isn't specific to railroads. But an inflation rate of say 2% a year makes little difference when you're replacing an asset after 1 or 2 or 3 years.

Inflation makes a huge difference when you're replacing an asset after 10 or 15 or 20 years.

A movie ticket cost \$4.20 in 1991. Try getting a replacement ticket for \$4.20 today.

Railroads tend to have free cash flow that is no greater than about 50% of their reported earnings. That's true of American railroads over the last 15 years or so (when inflation ran 2% a year using the GDP deflator). A couple railroads had free cash flow - the actual amount they could have paid in dividends each year - running around half of earnings. Most actually did even worse than that. This means their earnings don't all come in the form of cash.

Some of the 50% difference was caused by capital spending meant to grow the business. But a lot of that 50% difference between net income and free cash flow was caused by a gap between depreciation expense and the actual cost required to replace the railroad's assets.

Depreciation charges were too low relative to the actual cash upkeep needed to maintain the same assets and do the same volume of business.

That's bound to happen if railroads are replacing equipment that's 15 or 20 years old. Obviously, inflation makes the replacement cost higher than the original cost.

Yet depreciation isn't adjusted for inflation.

Companies depreciate against the original cost of the asset they use up over those 15 or 20 years. So if they buy something for \$1,000 that will last 20 years they charge themselves \$50 a year ($\$1,000 / 20 \text{ years} = \$50/\text{year}$). But even if inflation is just 3% a year over the next 20 years, the actual replacement cost when the thing breaks down in 2031 will be \$1,800. It'll be \$2,200 if inflation is 4%.

Let's assume inflation will be 3% over the asset's 20 year life. That means the replacement cost of something we buy in 2011 and replace in 2031 will be \$1,800 in 2031 for every \$1,000 we pay today.

If instead of depreciating against the original \$1,000 cost we make up a non-GAAP fantasy account I'll call "Provision for Future Equipment Replacement" we might use a straight-line method where we take the actual replacement cost (\$1,800) in 2031 and space it out evenly over 20 years. $\$1,800$ divided by 20 years equals \$90 a year.

So, we'd report depreciation of \$50 a year under the original cost method - assuming 3% inflation - even though we know full well that we have to set aside \$90 a year for the actual replacement cost of the equipment in 2031 if we live in a world of 3% inflation. That means our owner earnings should be reduced by multiplying depreciation by 1.8 ($\$90/\$50 = 1.8$). So, economic depreciation is really 1.8 times the depreciation we put on the books.

If you look at a group of 5 or 10 railroads, power companies, etc. you'll get a feel for how long the useful life of their entire business is. A big clue is property, plant, and equipment / capital

spending. If a no-growth business has \$32,000 of PP&E and \$2,000 in capital spending, it's shedding and regrowing its PP&E skin at a rate of once every 16 years (since it's replacing 1/16th this year). That's how long the business's life span is. It has to regenerate all its tangible assets every 16 years.

This is only meaningful for an asset heavy business like a railroad. It's not a relevant calculation for businesses that depend primarily – or entirely – on their current assets to produce earnings.

And all of this is in nominal terms. In reality, the company's property, plant, and equipment isn't being replaced every 17 years in a business where annual capital spending is 6% of PP&E ($1/0.06 = 16.67$). It's not like you're replacing the same 100 miles of track every 17 years. It's more like you're replacing the same \$100 worth of track every 17 years. How much track \$100 buys changes over the years.

Why should you care how long it takes a business to shed and regrow its balance sheet skin?

It gives you a clue as to how inflation is disguising the economic reality behind the reported earnings. Only businesses that are very asset heavy will be affected by inflation in this way.

But – even among asset heavy businesses – there's a big difference between a business that replaces those tangible assets every 6 years and a business that replaces those tangible assets every 16 years.

A business that replaces its tangible assets every 6 years will be depreciating some of those assets in 2005 dollars instead of 2011 dollars. But a business that replaces its tangible assets every 16 years will be depreciating some of those assets in 1995 dollars instead of 2011 dollars.

Railroads are an odd business in that their assets don't have to be replaced very often. It's just that they have to use unfathomable amounts of assets to move stuff around. Some other asset heavy businesses – especially very dense, very heavily used networks – have high capital spending but short asset lives.

Their depreciation expense is more accurate even though they're also big capital spenders, because the original cost of their assets is always closer to the replacement cost of those same assets.

None of this would be true if we lived in a non-inflationary world. But since the 1940s, we in the United States have tended to have more or less constant inflation. Prices never really fall for very long. And they rise ever higher over time.

The result is that our companies understate their depreciation expense in proportion to the age of the assets chewed up by their day-to-day operations.

Ravi Nagarajan of [Rational Walk](#) sent me an email where he mentioned that some industries do a good job of breaking down capital spending and explaining depreciation. That's true. The two

examples he gave were railroads and offshore oil drillers.

If you're wondering about how railroads calculate depreciation, there's a note in each company's 10-K that explains how it calculates depreciation.

Here is note #10 from the **Union Pacific (UNP)** 10-K:

*“...Properties and equipment are **carried at cost** and are **depreciated on a straight-line basis** over their estimated service lives, which are **measured in years**, except for rail in high-density traffic corridors (i.e., all rail lines except for those subject to abandonment, yard and switching tracks, and electronic yards), **which are measured in millions of gross tons per mile of track...**”*

Basically, Union Pacific is saying that they don't adjust their depreciation charges for inflation. They just take the original cost of the property and depreciate it using one of two methods.

The easiest way to think of the two depreciation methods is to imagine a hammer and an anvil. The property is the hammer. You can either set aside money to pay for a new hammer in equal installments every day or in equal installments every time the hammer strikes the anvil. For something like a hammer, the economically accurate way to depreciate the asset is based on the number of anvil strikes, because the anvil will eventually destroy the hammer. Time doesn't destroy hammers. Anvils destroy hammers.

Always ask what forces a company to replace its assets.

Is it time? Is it use? Is it technology? Or is it customer taste?

The best asset is one that can survive all those changes.

The worst asset is one that can't survive any of those changes.

Twenty years ago – back in 1991 – this is [what Warren Buffett told a group of Notre Dame Students](#):

“The telephone company (AT&T), with the patents, the MBAs, the stock options, and everything else, had one problem, and that problem is illustrated by those figures on that lower left hand column. And those figures show the plant investment in the telephone business. That's \$47 billion, starting off with, growing to \$99 billion over an eight or nine year period. More and more and more money had to be tossed in, in order to make these increased earnings, going from \$2.2 billion to \$5.6 billion. So, they got more money, but you can get more money from a savings account if you keep adding money to it every year. The progress in earnings that the telephone company made was only achievable because they kept on shoving more money into the savings account and the truth was, under the conditions of the '70s, they were not getting paid commensurate with the amount of money that they had to shove into the pot, whereas Lord Thompson, once he bought the paper in Council Bluffs, never put another dime in. They just mailed money every year. And as they got more money, he bought more newspapers. And, in

fact, he said it was going to say on his tombstone that he bought newspapers in order to make more money in order to buy more newspapers. The idea was that, essentially, he raised prices and raised earnings there every year without having to put more capital into the business. One is a marvelous, absolutely sensational business, the other one is a terrible business.”

So why did [Warren Buffett](#) buy Burlington Northern?

That’s a great question. Buffett has given some clues. His best explanation is probably [what he told Charlie Rose](#).

Since I don’t agree with Buffett’s purchase, I can’t do his argument justice.

I just have no interest in owning a railroad. It’s not a business I want to be in. That may be close minded. But that’s the truth.

What I wanted to do here is just make sure that the folks who **are** interested in buying railroads aren’t overly fixated on the P/E ratio.

A railroad’s reported earnings are not comparable to reported earnings in other industries.

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Geoff Gannon - formerly of Gannon On Investing - likes to answer questions from you. If you have an investing question you want answered, please email him at geoff@gannononinvesting.com.

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User Comments:

1. [Softdude2000](#) says on **Jan 23, 2011 at 5:24 AM:**

This is educational. Agree that railroad reported earnings are not comparable with that of other industries. May be even considering inflation of 3% is also not enough considering commodity prices today and policy to 'carry at cost'.

But to follow the principle of 'always invert', here is the question. Considering the thousands of miles of track these companies have, what should be value of the asset? How many court cases and environment issues will be raised if we try it now? I think it is almost impossible to create another railway company of BNSF or UNP magnitude even if we ignore real estate value. This invaluable/irreplaceable asset creates a pricing power that may overcome inflationary pressure? Will raising oil prices also add to pricing power? Is this why WEB said it is 50-year play?

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2. [Crafool](#) says on **Jan 23, 2011 at 9:25 AM:**

The author focuses on depreciation/capital investment, however does not seem to realize that rail roads offer huge advantages over long-haul trucking. Rail roads are far more efficient (Able to move a ton of product over 300 to 400 miles on a single gallon of diesel fuel), no traffic congestion, and greener foot print. They have unfathomable barriers to entry for to duplicate any rail road company would require a joint venture with governments at local, state and federal levels in order to purchase the land. How much would that cost??? These advantages are why rail roads have pricing power. Some analysts say anywhere from 30 to 50% over todays rates. Buffett says the greatest protection against inflation is "pricing power", which is just common sense. I think Buffett's play on rail roads is one of protecting Berkshire against inflation risks, the inevitable rise in our nations energy costs and allows BRK to put to work some of its vast cash that accumulates at a respectable rate of return. Remember BRK has that high class problem of always accumulating cash and not always having opportunities to put it to work.

I obviously believe railroads are the future, and Buffett made an excellent investment.

Happy investing to all!!!

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3. [Rnagarajan](#) says on Jan 23, 2011 at 9:30 AM:

Very interesting and insightful article. I think part of the answer regarding Buffett's decision to purchase BNSF is related to the deregulation that took place after passage of the Staggers Act in 1980. While it took the industry some time to show the benefits of deregulation, the performance over the past several years (and particularly during the recession) has demonstrated the incredible operating efficiencies of the rail network in general and the advantages over trucking given rising fuel costs and our increasingly decrepit interstate highway system. While maintenance capex is meaningfully higher than depreciation for the reasons noted in the article, inflation also has the effect of increasing the value of the existing network, so there are two sides to the coin. For example, when Berkshire purchased BNSF, the purchase price allocation assigned significantly more value to property, plant, and equipment than the predecessor company's prior carrying value.

In any event, I've been looking at BNSF and rails closely in recent days as part of my work on an upcoming report on Berkshire. I think the following data presents some revealing stats about the industry as a whole and BNSF in particular. An interesting observation is that the operating ratio for 2010 is likely to be at or near 70% - a historically excellent figure. Union Pacific has also reported excellent results - thanks to operating leverage and the industry's recovery in 2010.

SELECTED CLASS I RAILROAD: KEY INDUSTRY STATISTICS			
Industry-Wide Resource Availability:	2009	2008	2007
Miles of Road Operated less Trackage Rights	94,048	94,209	94,440
Miles of Track Operated less Trackage Rights	160,781	160,734	161,114
Miles of High-Density "A" Track Maintained	62,067	69,749	70,323
Locomotives in Service	24,047	24,003	24,143
Freight Cars in Service	416,180	450,297	460,172
Industry-Wide Financial Results			
<i>Figures in Billions</i>	2009	2008	2007
Freight Revenue	46.1	59.4	52.9
Operating Revenue	47.8	61.2	54.6
Operating Expense	37.2	47.3	42.7
Net Income	6.4	8.1	6.8
Operating Ratio *	77.80%	77.30%	78.30%
Return on Average Equity	9.79%	13.26%	11.49%
* Operating Ratio equals operating expenses as percentage of operating revenue.			
Source: AAR Railroad Statistics Report Dated October 29, 2010: http://bit.ly/hIm0JA			

BNSF KEY OPERATING STATISTICS				
Resource Availability:	2010	2009	2008	2007
Miles of Road Operated less Trackage Rights		23,000	23,000	23,000
Miles of Track Operated less Trackage Rights		40,000	40,000	40,000
Locomotives in Service		6,759	6,510	6,400
Freight Cars in Service		79,329	82,555	85,338
<i>Figures in Millions</i>	2010	2009	2008	2007
Freight Revenue		13,588	17,503	15,349
Operating Revenue		14,016	18,018	15,802
Operating Expense		10,754	14,106	12,316
Net Income		1,721	2,115	1,829
Operating Ratio		76.7%	78.3%	77.9%
Source: 2010, 2009, and 2008 10-K				

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4. [Ilovesummer](#) says on **Jan 23, 2011 at 9:41 AM:**

The railroads have a huge barrier to entry. The land and equipment costs would be astronomical.

The use of intermodal containers has improved the efficiency of rail as has technology.

Rail is the only one that can haul heavy goods such as coal efficiently.

Also don't forget that fuel costs are rising and railroads are more fuel efficient than semi truck.

If you compare the costs and logistics of shipping by rail compared to shipping by truck you will understand. Semi hauling works for light or regional hauling, rail is the only option for longer and

heavier hauling.

Consider the manpower involved in 1 semi truck and 1 rail car. A hundred rail cars only takes 3 or 4 guys

but a hundred semi s takes a hundred guys.

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5. [RiskAverse](#) says on Jan 23, 2011 at 10:01 PM:

Geoff, Very Interesting Article.

As mentioned earlier, earnings are overstated in rail road business and CapEx will be much higher than the actual depreciation. In my view average growth in CapEx can still be estimated for a 10-20 year term and a reasonable FCF can be derived. But even taking an FCF of 50% of Nett. Earnings shows a steady cash flow for rail road businesses. That's the reason I feel why Buffett compares this industry with Utility business.

Also looking at the qualitative factors (good ones mentioned in the above comments) Rail road businesses are monopoly business with pricing power. Hence they would increase their Earnings (and FCF) though the pricing would be regulated. A steady growth in FCF along with the certainty part of this cash flow in my view makes this an excellent business.

Thanks

Yogesh

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6. [Softdude2000](#) says on **Jan 25, 2011 at 2:47 PM:**

Off topic.

From Ravi's post it does not look like BNSF is anyway better than industry as a whole (consider operating ratio). Why did WEB select BNSF and not UNP ? I tried comparing both before acquisition but cannot come to conclusion. May be he knows BNSF management.

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7. [Rnagarajan](#) says on **Jan 25, 2011 at 3:12 PM:**

That is a very good question and one that I've been thinking about lately. The following is a draft version of a pop-out box from my upcoming report on Berkshire. Doesn't consider this in depth but looks back at the history of the positions BRK owned in 2007-2009. Initially, the Union Pacific and Norfolk Southern positions were bigger than BNSF. Then Buffett steadily increased the BNSF position and decreased Union Pacific and Norfolk Southern.

I think it's pretty clear that he likes the economics of the western network which is why Norfolk Southern wasn't pursued. But then we need to think about why BNSF was picked over Union Pacific. There could be many reasons but I still get the sense that coal and potential rights of way that could be leveraged by MidAmerican might have something to do with this. At the risk of using the word "synergies", the overlaps between MidAmerican's pipelines and BNSF's rights of way may be too important to ignore when considering this question.

Why Did Buffett Choose Burlington Northern Santa Fe?



When Warren Buffett's interest in the railroad industry was first disclosed in early 2007, Burlington Northern Santa Fe was not the only railroad investment in Berkshire's portfolio: Larger positions in Union Pacific and Norfolk Southern were revealed in the same 13F report. However, Berkshire sold the bulk of the Norfolk Southern and Union Pacific positions in the second and third quarters of 2007 while the Burlington Northern position was steadily increasing.*

Norfolk Southern covers the eastern one-third of the country and has little overlap with Burlington Northern. Union Pacific, on the other hand, is Burlington Northern's primary competitor with coverage in the western two-thirds of the country. While a comparative analysis of the three railroads is beyond the scope of this report, it appears that Mr. Buffett clearly preferred the Western presence of the BNSF system and perhaps was attracted to the company's coal transportation operations in the Powder River Basin region.

Berkshire's MidAmerican Energy subsidiary operates coal plants as well as a pipeline network that may require new rights of way in the future. While Berkshire typically does not pursue synergies between operating companies, the prospect of favorable economics between the railroad and utility operations having geographical overlap seems difficult to ignore.

* History of the Norfolk Southern and Union Pacific investments: <http://bit.ly/hNkzP2> and <http://bit.ly/fjpbBC> via Dataroma.

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