

Sorting Through UNP's Demand Environment

The Devil is in the details

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Key Takeaways

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- **The demand environment of a company is the most important factor to consider for directional investors.** The demand environment drives revenue growth at a firm.
- **Some companies' top line growth is affected by various factors unrelated to the demand environment.** These factors often include acquisitions; in UNP's case fuel surcharges and pricing power muddy the analytical waters.
- **Simple statistical measures often give you the wrong answer.** Correlation does not imply causation and stopping to ask questions about demand when you have a high r-squared value on a regression is an excellent way to completely misunderstand a company.
- **The IOI analysis of UNP decomposes the two fundamental drivers of revenues: Price and Volume.** This article walks through the thought process we used to model UNP's revenues.

Introduction

A point that I make in IOI training courses is that the best directional investors focus on issues related to revenue generation. As such, most of the time I spend when valuing companies is spent trying to understand the demand environment that leads to the company's revenue growth.

We recently published several articles regarding Union Pacific (UNP), including a valuation and a fair value estimate.

This article is written to show you how we came to understand the outlook for revenue growth at UNP and how we modeled that in our valuation analysis. We cover several important points:

1. How dangerous it is to blindly trust statistics
2. The importance of coming to an understanding of price and volume
3. Tactical strategies to using Sell Side research

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Top-Line Revenue Numbers

UNP's revenues have increased at a good clip. Discarding the fall in 2009, the average year-over-year revenue growth for the series is 8%. Further discarding 2015, the growth becomes 10%.

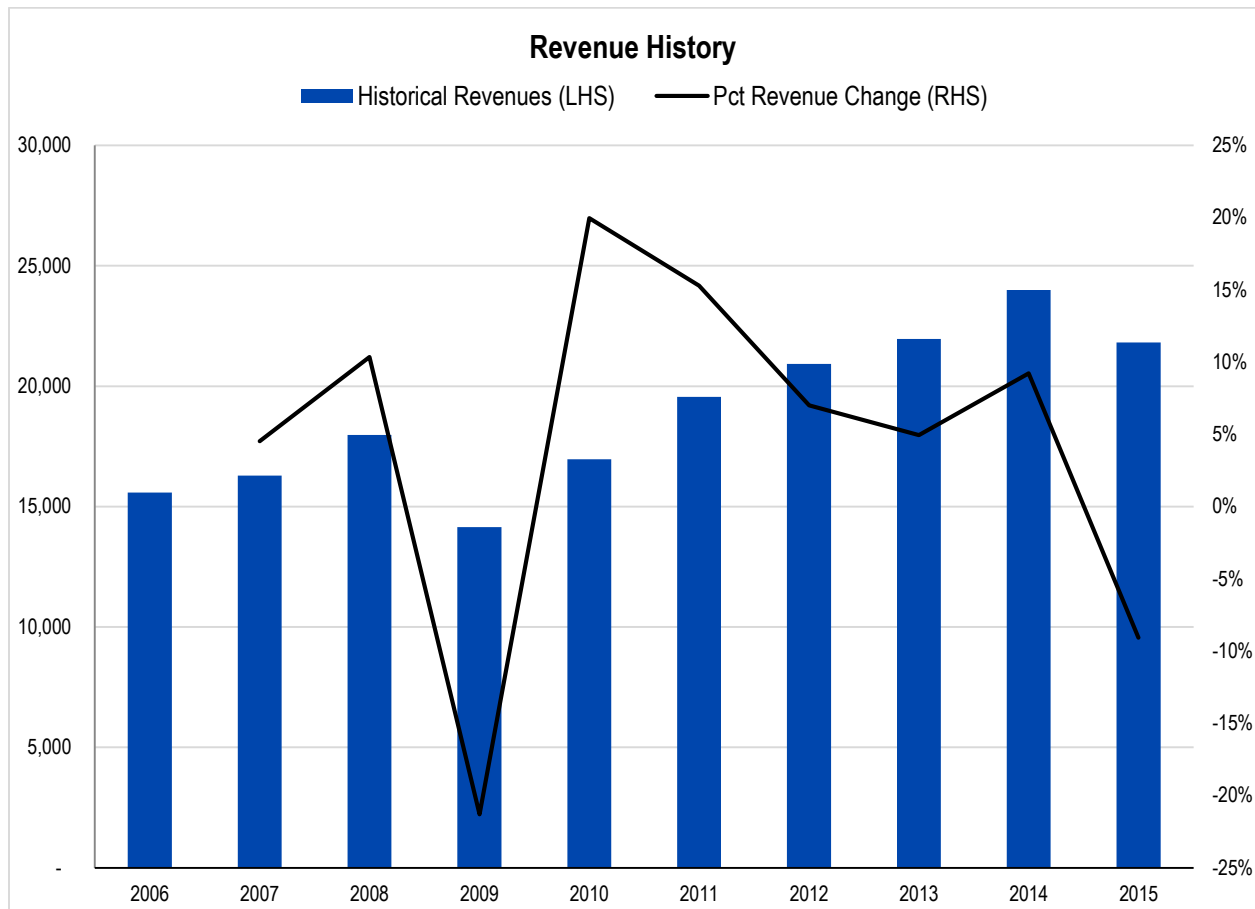


Figure 1. Source: Company Statements, IOI Analysis

Fine Tuning

How could a company like a railroad, which I thought should grow at around nominal GDP, be displaying such a quick growth rate?

The first thing to do in such a situation is to see if there are data available at a segment level. Indeed, UNP provides these data, so we tried to figure out the strength of the demand environment by looking at segment details.

Segment-Level Revenue Numbers

Looking at segment data, we again find very strong growth in all but Coal, and we also notice a very quick and deep downturn from 2014 to 2015 for all segments but Automotive and to a lesser extent, Chemicals.

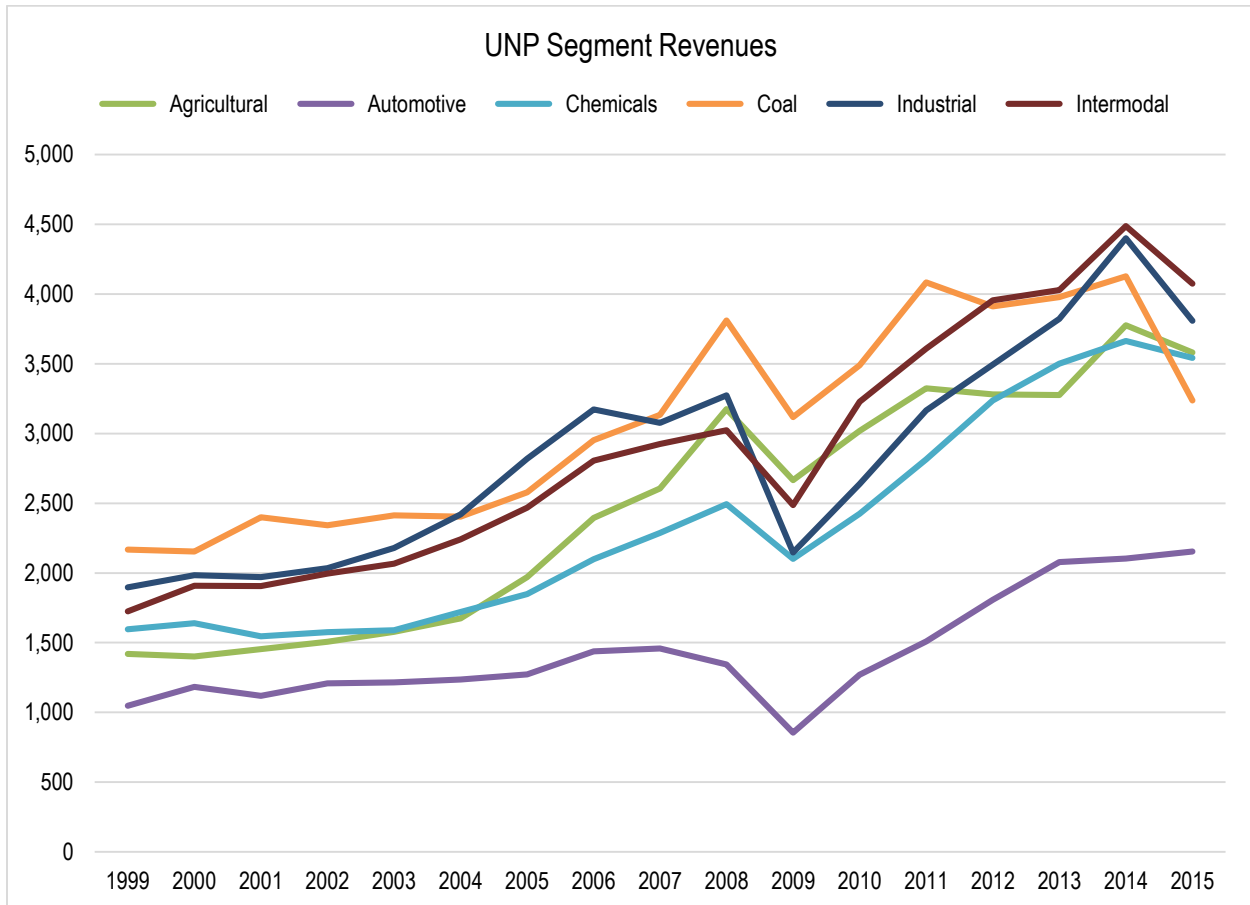


Figure 2. Source: Company Statements, IOI Analysis

Fine Tuning

Looking at the rolling growth rates (RGR) at a segment level, here are the numbers we found:

	1999-2009	2009-2015
Agricultural	7%	5%
Automotive	-2%	14%
Chemicals	3%	8%
Coal	4%	1%
Industrial	1%	8%
Intermodal	3%	7%

Again, these numbers looked odd to me. Why would Agricultural revenues be increasing so quickly in the run-up to the financial crisis, for instance – certainly the demand for agricultural goods should be more like the population growth rate, I thought.

Post-crisis, the numbers are even more startling. Considering the very tepid growth rate of the economy at large, these numbers looked aberrant.

In general, statistical methods should be employed to help you decide which questions to ask, not to give you the answer to questions.

We looked at correlations between segment data and obvious underlying data (e.g., Automotive segment revenues and U.S. auto sales), and found very high correlations. This turned out to be a deceptive side-track though. Of course since revenues are increasing, if you regress them against some other increasing quantity, you'll get a high level of correlation. I did not do this, but I imagine that we would get pretty high correlations and r-squared values by regressing Agricultural segment revenues against U.S. smart phone sales. Obviously, there would be no true economic correlation, but there would likely be an apparent statistical one.

Doing further reading on UNP, we discovered that since the mid-aughts, the company had begun charging a fuel surcharge due to soaring diesel prices. Backing out these fuel surcharges, the overall revenue growth rates looked very similar to the growth of the economy at large. Again, this relationship shows some correlation, but is it causal? I still had my doubts.

My doubts about some simple, obvious correlation were reinforced when I started reading articles about the extent to which railroads had been increasing shipping costs. Shippers reported being charged sometimes twice or three times their previous rates when contracts were negotiated (one Chemical company executive said that when he questioned a railroad negotiator regarding a steep price increase, the latter responded by saying "If you don't like it, go out and build your own railroad").

My goal was to understand the drivers behind the fundamental law of revenues: Revenue = price x volume.

Clearly, there were things affecting pricing – repricing of contracts and fuel surcharges – but shipping volumes would tell me more about the demand environment for UNP's services. We spent some time trying to sort out what portion of the revenue increase for segment related to pricing power vis-à-vis shippers (see our [Valuation Driver Analysis of Union Pacific \(UNP\)](#) to see this work)

This train¹ of thought led us to look for some data that related specifically to freight volume by segment.

¹ Pun entirely intentional – forgive me!

Freight Volume by Segment

Railroads measure volume in units of “Revenue Ton Miles” and report statistics on this. The picture we saw when looking at the company from this perspective was entirely different from the one we got by looking at revenue numbers.

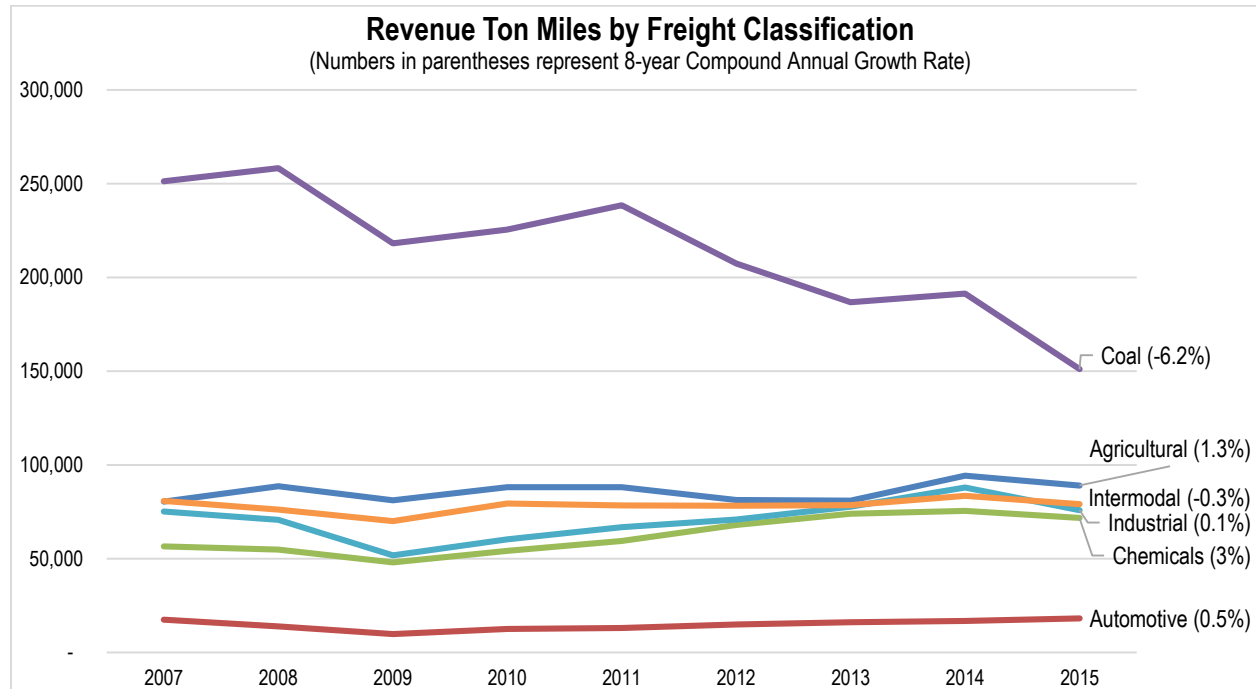


Figure 3. Source: Company Statements, IOI Analysis

Details Related to Volumes

This is quite a graph! Here, we see that demand for UNP’s service of freight transport has remained flat or – in the case of Coal – notably declined since the last economic peak. We did not look at the backstories for each segment, but did dig into two areas in particular – Coal and Intermodal. Coal represents the highest Revenue Ton Miles and Intermodal represents the largest share of UNP’s revenues.

Two of the most important freight categories have bearish backstories that we believe are important.

Automobile transport generates the highest revenues per ton miles but makes up the lowest proportion of revenues overall.

The story for Coal was clear – as natural gas prices decreased and more attention began to be paid to environmental issues, power producers (virtually all of UNP’s coal is used in U.S. power plants) had been shifting their production to rely on natural gas rather than coal. Looking at various articles related to this trend, it seems that most observers think this trend will continue.

Intermodal had an interesting back-story. The driver for this segment is China-US trade. Chinese goods are shipped in shipping containers; these containers are transferred directly to trains, which ship them across country; at East Coast terminals, the containers are transferred directly from trains onto trucks for delivery to their final destinations. Seventy percent of US population lives east of the Mississippi yet now 65% of all freight is unloaded on West Coast ports. Part of the reason for this is that the Panama Canal cannot accommodate very large ships (which are more efficient for shippers, of course). In other words, at least some of the natural demand for UNP’s Intermodal business was due to capacity issues related to the Panama Canal. It turns out that the Panama Canal is undergoing major improvements to increase the capacity of ships that can traverse it, and East Coast ports are responding by increasing the capacity of ships they service. This hints that UNP’s Intermodal business may face at least some declines. An article in [Progressive Railroading](#) estimated that the balance of freight into West Coast versus East Coast ports would shift from roughly 65-35 to roughly 50-50 as the Panama Canal improvements took effect.

Modeling

With the volume question answered, we realized that we could model revenues in each segment by doing best- and worst-case volume projections and multiplying them by best- and worst-case price projections.

For the latter, we first adjusted revenues per ton mile for each segment by assuming that fuel surcharges were proportional to revenue ton miles.

Next, we looked at trends for adjusted revenues per ton miles for each segment and determined best- and worst-case projections for these. These projections are related to the pricing power UNP has over its shippers and is likely to have going forward.

Last, we used our volume analysis to derive best- and worst-case projections for volumes. These projections are related to actual demand for carriage of each of the freight classifications.

Sell Side analysts have enormous resources and are very good at forecasting near-term numbers. Using their numbers is often easier and more fruitful than spending time trying to develop an independent educated view about the near-term.

This model gave us a picture of UNP as a firm that has the potential to moderately expand its revenues over time. Checking our model versus what Sell Side analysts projected for UNP’s revenues for this fiscal year, we found our Year 1 projections to be higher than other analysts. This is not unusual – we are trying to generate a general understanding and picture about what drives UNP’s cash flows; Sell Side analysts are trying to generate accurate EPS for the next two quarters and the fiscal year as a whole.

We used the highest Sell Side estimate for our Explicit Stage Year 1 best-case projection and the lowest Sell side estimate for our worst-case projection. We left the percentage change the same on years 2-5 of the explicit stage.

Full Valuation

After making these projections, we fit them into our valuation model and found a worst-case average revenue growth of 0% over the Explicit Period and a best-case one of 5%. Interestingly, this is not too different of an answer that you might get from eye-balling the nominal numbers, but the process of finding these estimates allowed us a much better understanding about the business dynamics of the firm.

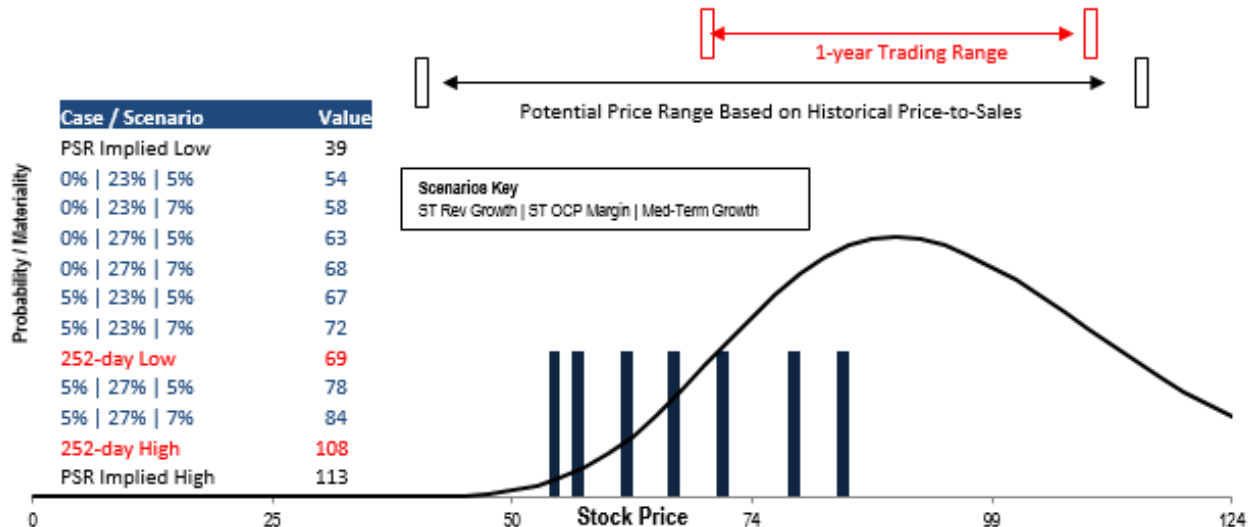


Figure 4. Source: CBOE, IOI Analysis

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