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## P-R-O-C-E-E-D-I-N-G-S

(9:32 a.m.)

MR. ELLIOTT: Good morning everyone.

Why don't we reconvene the hearing? Just a few reminders, the lights are up here. When you see the yellow light it means that you have one minute left. When you see the red light that means your time is up. Obviously, we're fairly liberal on the red light, but we would like you to keep that mind, and if someone does start running over maybe the lawyer next to them can give them a little elbow just so he knows that that's happening.

Let's see what else do we have? If you haven't checked in already please check in up front, and what else? I just want to make sure I have all the emergency stuff, always very important, especially in a rail proceeding. Safety first, so if there is an evacuation necessary, please proceed through the back doors. There is a description of the evacuation procedures in the back. You'll head out of the

1 building through the front entrance that you came  
2 in. There is a place to convene on those  
3 instructions in the back.

4 Also a note regarding slide  
5 presentations, if you haven't put those in the  
6 record please do so within the next two days or  
7 provide two copies up front. Also, we are going  
8 to take another break for lunch today. Thank  
9 goodness we did that yesterday, because it was  
10 quite a long day. So we will probably do  
11 something similar to what we did yesterday, which  
12 would be after, well, we'll see how it plays out.  
13 But it might be after the AAR or Panel III. And  
14 lastly, I would like to thank staff very much.  
15 We don't realize how much work this takes to come  
16 up with our preparation, the set-up for the  
17 hearing. It's a lot of work. Staff has done an  
18 excellent job, and I really appreciate what they  
19 have done. We are very lucky here at the Board  
20 to have such excellent staff that fills in,  
21 because their normal job is not to set-up  
22 hearings. So we greatly appreciate that. So why

1 don't we bring up the first panel today, Western  
2 Coal and Arkansas Electric? Please begin any  
3 time you're ready.

4 MR. ROSENBERG: Good morning. I'm  
5 Robert Rosenburg of Sloven Loftus appearing on  
6 behalf of the Western Coal Traffic League,  
7 unfortunately accompanied by the League's two  
8 expert witnesses, Dr. Levine, the former Vice  
9 President of Economics and Finance for the AAR  
10 and Professor Triantis, who's the Dean of the  
11 Roger H. Smith School of Business at the  
12 University of Maryland. We greatly appreciate  
13 the Board's accommodating our expert witnesses'  
14 scheduling constraints. I expect you're more  
15 interested in hearing from our experts, but allow  
16 me to speak first.

17 The Board's stated objective is to  
18 measure the opportunity cost of capital. Done  
19 properly, the cost of capital should reflect no  
20 more than what is required to attract needed  
21 capital, or more significantly these days, retain  
22 that capital since the larger railroads have not

1 needed to raise equity from outside investors for  
2 nearly twenty-five years. Instead they've been  
3 sending cash out to equity holders through  
4 dividends and large stock buy-backs.

5 Investors invest based on expected  
6 returns. To measure those investor expectations  
7 one would logically use the same approach as the  
8 financial and investment community, since that is  
9 how investors formulate and express their  
10 expectations. That means the same model, the  
11 same inputs, the assumptions and to the extent  
12 possible, the same results. The Board has  
13 adopted this approach in Maine but with respect,  
14 less so in practice. The Board's hybrid  
15 methodology deviates substantially from  
16 prevailing financial practices and results. In  
17 other words our issues are less with the theory  
18 and more with the implementation. They are  
19 substantial.

20 CAPM long ago displaced MSDCF as the  
21 dominant cost of capital model, especially for  
22 firms such as railroads that are not subject to

1 pervasive economic regulation. The Ibbotson 1926  
2 base risk premium overstates the returns that  
3 investors expect to achieve in a current  
4 environment and the basis on which they invest.  
5 A Blume data adjustment is also common. Failing  
6 to follow these norms has led to cost of capital  
7 values that substantially exceed industry  
8 benchmarks. The consequences include overstated  
9 ERCs costs and jurisdictional thresholds,  
10 unreasonable rates that are made to appear  
11 reasonable and immune from challenge and  
12 reductions in rate relief.

13           The overstatement incenses and enables  
14 railroads to increase their rates and reduce  
15 their volumes and limit their capacity  
16 investment. It also makes a very revenue-  
17 adequate industry appear less sustainable, as the  
18 industry has been earning its cost of capital  
19 over at least the past decade. Correcting these  
20 flaws is not difficult. What's needed is to  
21 describe the MSDCF and return to relying solely  
22 on the CAPM, as the Board did in 2005 and 2006,

1 but update that CAPM by using a more reasonable  
2 risk premium and a Blume or some other data  
3 adjustment that is tied less to the railroad's  
4 recent exploitation of their market power, and is  
5 more reflective of the economy as a whole.

6 The current MSDCF is particularly  
7 defective. As deployed it lacks transitions that  
8 should be fundamental. It depends heavily on  
9 growth rates that are unlikely to be accurate to  
10 begin with. The growth rates are being further  
11 tainted by the industry's substantial buy-backs.  
12 The fixes that the AAR discusses for the MSDCF  
13 only exacerbate the problems. For example, the  
14 AAR's buy-back solution to treat them as an  
15 additional distribution to stockholders involves  
16 a double count since the model already recognizes  
17 all available cash flow and then some.

18 CAPM is the most widely used approach  
19 even according to Professor Myers. The 2013 best  
20 practices survey among 19 leading firms,  
21 including UP, found that ninety percent use CAPM  
22 exclusively, and only one used the dividend

1 discount DCF approach. And that was just a back-  
2 up to the CAPM. The 2013 survey of the  
3 Association for Financial Professionals also  
4 showed DCF under five percent. Morningstar's own  
5 2010 survey of subscribers showed less than  
6 twenty-five percent used DCF models. Morningstar  
7 itself doesn't use the MSDCF and no longer even  
8 publishes it. The MSDCF simply lacks the wide  
9 commercial acceptance that Board posited in 2009.  
10 CAPM is overwhelmingly preferred in the market.

11 It would be one thing if the MSDCF and  
12 CAPM produced similar results but they have not.  
13 To the extent the results may appear close in  
14 2013 or '14, it's only because the Board's risk  
15 premium bated inputs lead to CAPM overstatement.  
16 The Board needs to establish which method is more  
17 credible, reliable and accepted. CAPM should be  
18 an easy choice. The AAR criticizes CAPM for  
19 being backwards-looking, but that relates to how  
20 it is applied. In particular, the AAR insists  
21 that the Board continue to use a backwards-  
22 looking, very dated and consequently overstated

1 historical risk premium that does not conform to  
2 current practice. The proper and common approach  
3 is to use a risk premium that reflects current  
4 expectations rather than long-term past  
5 performance.

6 One can get to a more reasonable,  
7 current and commonly accepted risk premium by  
8 several different paths. One can, like Canada,  
9 use a shorter historical period, such as fifty  
10 years, that better represents current conditions  
11 but still retains stability and accuracy. There  
12 are the various surveys that we present in our  
13 evidence, such as those by Graham Harvey, the  
14 Association for Financial Professionals and  
15 Professor Fernandez, that reflect what chief  
16 financial officers, academics and financial  
17 professionals currently utilize for the risk  
18 premium.

19 All of those surveys point to a risk  
20 premium of five percent or lower. Duff & Phelps  
21 also recommends five percent. And as of March  
22 this year, Morningstar released an article

1 showing that it's using a four point five percent  
2 risk premium. An alternative is to derive the  
3 premium that's implied by using market valuation  
4 and cash flow projections. The AAR replied,  
5 included this approach and derived a high  
6 premium, but only by using a single-stage DCF  
7 model, essentially equivalent to what the Board  
8 used prior to 2006 for capturing the railroad  
9 cost of equity and which Professor Myers included  
10 in his text book is an example of how not to  
11 calculate cost of capital.

12 A better approach that's employed by  
13 Professor Damodaran of the New York University's  
14 Stern School of Business, and shown posted on his  
15 website, is to use an MSDCF, and his approach  
16 includes buy-backs and cash flows, uses five  
17 years of earnings per share and projections and  
18 then a terminal growth rate. After adjusting for  
19 a twenty-year, risk-free rate he uses a ten year  
20 risk-free rate. His approach currently results  
21 in a risk premium of around five percent or less.

22 All these paths confirm that the 1926-

1 based risk premium is not the industry norm. The  
2 historical risk premium may actually measure the  
3 past but investors look to the future. Using a  
4 1926-based risk premium at seven percent when  
5 investors expect a premium of five percent or  
6 less overstates the incentive needed to attract  
7 investment. It gives investors or the railroads  
8 a windfall return at the expense of captive  
9 shippers. If the Board wants to follow the  
10 industry norm, which is what it previously said  
11 it wants to do, it should modify its approach.  
12 Likewise, a Blume adjustment to the data is  
13 generally as being more reflective of the long-  
14 term prospective trends, although something more  
15 direct or substantial may make more sense,  
16 especially given BNFS's status and the evidence  
17 that the high datas in recent years have resulted  
18 from the exercise of railroad market power rather  
19 than any increase in inherent risk.

20 Finally, we have evidence from a  
21 variety of respected sources, showing that the  
22 results of these changes, and not just the

1 underlying methods and inputs, track what the  
2 financial investment community perceives. The  
3 railroads didn't submit any evidence of that  
4 sort, although they logically have full access to  
5 all of it. Their silence is conspicuous. Let me  
6 turn to some additional questions in the Board's  
7 notice.

8           The League opposes the use of  
9 replacement costs for the reasons presented  
10 yesterday. But if replacement costs are  
11 utilized, then it becomes necessary to use a rail  
12 cost of capital in order to avoid a double count  
13 of inflation. So you would have gone from using  
14 two things that are reasonably knowable, meaning  
15 the net book value of assets and the nominal cost  
16 of capital, to two things that are difficult to  
17 determine, are not regularly calculated and so  
18 utilized, meaning the replacement costs of the  
19 rail networks and the rail cost of capital, when  
20 the ultimate result, if done correctly, probably  
21 shouldn't change. You would just be making life  
22 difficult for yourselves for no good reason that

1 we can discern.

2 Let me also note a few years ago that  
3 the League proposed that the Board revise its  
4 determination of the railroad debt equity capital  
5 structure to treat operating leases as debt in  
6 order to conform with standard practice within  
7 the financial community. The AAR proposed, and  
8 the Board rejected the proposal on the grounds  
9 that it was too difficult and was also  
10 inconsistent with GAP, generally accepted  
11 accounting principles, even though the cost of  
12 capital isn't even part of GAP. Essentially our  
13 proposal didn't get the time of day. Now  
14 replacement costs are extremely difficult, they  
15 are not consistent with GAP and they are not  
16 consistent with standard financial practice. Yet  
17 the Board is asking about the replacement cost  
18 and not capital structure. Symmetry and balance  
19 seem to be missing. Also, if the Board is still  
20 insistent on considering an MSDCF approach, we  
21 would suggest you look again at the model that  
22 the League proposed seven years ago, which turns

1 out to be very similar to what appears to be the  
2 Browder (phonetic) Group standard model, defining  
3 cash flows as dividends plus buy-backs and begin  
4 to phase them to the terminal growth rate by year  
5 six.

6 In addition you should adjust the BPS  
7 growth rates to reflect the EPS growth rates to  
8 reflect buy-backs, but again we continue to see  
9 no reason to include the MSDCF as part of some  
10 sort of average. Finally, the AAR and its  
11 required comments address at some length what  
12 various League members, the various investor-  
13 owned utility or IOU members had said in their  
14 own rate cases and to the State Public Utility  
15 Commissions and at FIRC. Since the AAR's oral  
16 presentation may also dwell on such things and we  
17 may not otherwise have a chance to respond, let  
18 me note three points.

19 First, it's not surprising that  
20 regulated entities seek higher return on equities  
21 or ROEs, or that their customers seek lower ROEs.  
22 That's the sort of thing that makes the world go

1 around. The League is composed of not only  
2 investor-owned utilities but also public power  
3 and electric cooperative utilities. You  
4 shouldn't be surprised if they don't see  
5 everything the same way. In particular, the  
6 Public Power and Coop Utilities have been the  
7 leaders at FIRC in seeking lower ROEs for the  
8 IOUs. In that regard we would note that the  
9 Browder said a number of things in recent years  
10 that support the League's position, and a number  
11 of those matters are noted in the League's  
12 required comments.

13           Second, rather than focus on what  
14 parties have or haven't said elsewhere, it's more  
15 instructive to focus on what regulators have  
16 actually done. The ROEs for electric utilities  
17 at FIRC and at State Public Utility Commissions  
18 are now generally around ten percent or lower,  
19 but those are leashed to be considered in  
20 conjunction with the utilities' capital  
21 structures, which are generally around 50/50  
22 equity and debt. If you will put up briefly with

1 some relatively quick math, you take fifty  
2 percent equity at a ten percent cost of equity,  
3 put that past an equity component of five  
4 percent. If you take fifty percent debt at a  
5 five percent cost of debt, multiply the two  
6 together, that's a two point five percent cost  
7 for the debt component. If you add the two  
8 together you get a total-weighted average cost  
9 capital of seven point five percent. If you  
10 wanted to use that for the railroads we probably  
11 wouldn't complain, but note that seven point five  
12 percent isn't unrealistic.

13 Professor Demodaran, on his website,  
14 comes in slightly lower for the railroad  
15 industry, and that's even removing the tax shield  
16 for debt. And that's without treating operating  
17 leases as debt per standard financial practice.

18 Third, where there is extensive,  
19 pervasive regulation, as with electric utilities,  
20 a MSDCF may actually make sense. Rates are based  
21 on costs not the market. There is little if any  
22 rate discrimination or differential or Ramsey

1 pricing. Investors focus on dividends not  
2 depreciation, and buy-backs are rare. Under  
3 these circumstances, revenues and costs are more  
4 predictable. Analysts' projections may be  
5 reasonably accurate, and dividends and stock  
6 prices may be stable, and the DCF analysis may  
7 work. The Browder Group said as much in its  
8 report to Canada, but that sort of cost-based,  
9 nondiscriminatory rate setting amounts to exactly  
10 the sort of regulation that is an afirma to the  
11 railroads as you heard at length yesterday.

12 The reasons that the DCF may work for  
13 utilities are the same reason it isn't used for  
14 unregulated sectors, and that's why it shouldn't  
15 be used for the railroads. With that I'll thank  
16 you for listening to me, and I'll ask our experts  
17 to speak. Since Dr. Levine has the most pressing  
18 scheduling constraint I'll ask him to go first.

19 DR. LEVINE: Thank you. Thank you and  
20 good morning. You can probably tell by looking  
21 at me I've been around a long time and my  
22 education in the railroad industry started some

1 fifty years ago when I took an undergraduate  
2 course at the University of Pittsburgh called  
3 "The Railroad Problem." And you can imagine what  
4 it was and remained for quite a while. It was a  
5 study of an iconic industry that has both a  
6 public interest and a public responsibility that  
7 was heading toward financial insolvency. That  
8 persisted for many years during my first  
9 employment with the New York Central Railroad,  
10 where I was the Assistant Director of Pricing  
11 Research. I took a position with the Department  
12 of Transportation, working in the Secretary's  
13 office as a Senior Economist, came to the  
14 Interstate Commerce Commission as the Director of  
15 Economic Research, and eventually became a Vice  
16 President of Economics and Finance at the AAR,  
17 where for many of those years the railroad  
18 problem still persisted. But as we all know,  
19 things are really changed. And might I say,  
20 during those years when the Interstate Commerce  
21 Commission adopted the DCF model, credibility was  
22 not an issue. Everybody knew that the rail

1 return on investment would always be below the  
2 cost of capital. And so as we used to say in the  
3 railroad industry, railroad earnings are woefully  
4 inadequate. And "woefully inadequate" was just  
5 one word.

6 But in more recent years, as we well  
7 know, there's been a great turnaround in the  
8 railroad industry. And I just want to go out on  
9 a tangent for a second and tell you why, because  
10 it has some meaning for the cost of capital and  
11 for what we all heard yesterday. It started in  
12 1970 when the railroad industry divorced  
13 passenger service from its offerentia. That was  
14 costing freight railroads an estimated one  
15 billion dollars a year. So with government help  
16 that cost was eliminated. And then we all know  
17 that in the 1970s, through legislation, bankrupt  
18 railroads in both the Midwest and in the East,  
19 and their bankrupt railroads are reorganized.  
20 Again, with much government assistance, as it  
21 should be because that's the nature of the  
22 industry. We got the 1980 and the Staggers Act.

1 There was a DAAR at the time and worked on that,  
2 and the Staggers Act, I think people have a  
3 misconception as to the impact of the Staggers  
4 Act on the industry. In my mind, at least, there  
5 were two provisions that really were responsible  
6 for a substantial portion of the railroad gains.

7 First of all there was the adoption of  
8 the rail-cost adjustment factor, where railroads  
9 could increase rates based on the increases in  
10 that factor without interference from the  
11 regulatory authority. I know all about that  
12 because I was the one that designed the rail-cost  
13 adjustment factor. And I had a choice to either  
14 think of it as a cost factor or as an inflation  
15 factor, because the wording of the Staggers Act  
16 was inflationary costs. I opt for the inflation  
17 factor so that railroads could raise rates based  
18 on inflation not on cost. And there's a huge  
19 difference as we know. If labor rates go up  
20 three percent but you eliminate four percent of  
21 the labor force, you've actually reduced your  
22 cost even though you had an inflationary cost

1 increase. And that gap has remained for thirty-  
2 five years where the inflation factor, unadjusted  
3 for productivity, has accelerated while railroads  
4 have decreased.

5 And the second factor of the Staggers  
6 Act I think was very important was the allowance  
7 of contract rates as existed in Canada for many  
8 years. And then finally, and I think probably  
9 even of greatest importance in terms of the  
10 resurgence of railroads, has been the  
11 consolidation in the industry. When I started at  
12 the AAR in 1979, I think there were 39 Class I  
13 railroads, now four dominate the industry. What  
14 happened during that time? There has been a huge  
15 reduction in the labor force, hundreds of  
16 thousands of employees, tens of thousands of  
17 miles of track have been eliminated, tens of  
18 thousands of grade crossings have been  
19 eliminated, and there's even been a shift in  
20 investment in rolling stock, from the railroad's,  
21 the third-party owners. So while the Staggers  
22 Act was important, it's not the sole reason why

1 railroads have had these insurgents. And the  
2 point here is that a sound cost of capital  
3 methodology is not a threat to the railroad  
4 industry. It's not a threat to the Staggers Act,  
5 and it would not change the industry's strong  
6 market position. The reason why railroads are in  
7 such a strong market position is because they're  
8 in a strong market position.

9           And when I heard yesterday how an  
10 accurate revenue-adequacy determination would be  
11 in conflict with the Staggers Act, I thought of  
12 the analogy of the cost of capital. I don't  
13 think the Staggers Act is threatened by either a  
14 sound revenue-adequacy determination or an  
15 accurate cost-of-capital calculation. Let me  
16 just mention a few changes in the railroad that  
17 affect the cost of capital. We talked about the  
18 increased concentration in the industry. Four  
19 railroads dominate the industry as we all know,  
20 and on ninety percent of the traffic, and  
21 probably control close to a hundred percent. In  
22 other words, they're just too big and too

1 important to fail. So with implicit federal  
2 government backing I think that the risk of  
3 investing in railroads is even lower than the  
4 calculated betas.

5 Furthermore, only three of these  
6 railroads are publicly traded. As we know, the  
7 fourth is owned by Berkshire Hathaway. In  
8 essence, there is no cost of capital for the  
9 Burlington Northern Santé Fe. A cost of capital  
10 of that railroad is actually the cost of capital  
11 of Berkshire Hathaway, which is often below one  
12 point zero. That has to be taken in  
13 consideration when developing a cost-of-capital  
14 methodology. Since the UP in many ways parallels  
15 the operations and finances of the BNSF and its  
16 beta, its risk factor has been declining to about  
17 1.0, this means that two-thirds of the railroad  
18 industry have a beta that is similar to the  
19 market as a whole, 1.0. It's a major factor in  
20 determining the cost-of-capital methodology, and  
21 it lends itself more to a CAPM than it does to a  
22 DCF model.

1           In my opening remarks I showed that  
2           the, I'm going to call it the DCF. I just don't  
3           want to say MSDCF. The DCF results on average  
4           over the past six years with 32 percent above the  
5           CAPM results. Well, you can argue, I guess, that  
6           the CAPM results were too low, but I showed that  
7           all three components of that CAPM were actually  
8           higher than they should have been. First, the  
9           Board used, in its methodology, twenty-year bond  
10          yields, where if you used ten-year bond yields,  
11          and they're used elsewhere, would give you a  
12          lower rate. And the railroads themselves by the  
13          way, when it comes to risk-free rates, if you  
14          look at their annual reports and their proxy  
15          statement, they develop risk-free rates based on  
16          the award of stock options to their executives.  
17          And that's also lower than the 20-year bond rate.

18                 Then for the beta, the second portion  
19                 of the CAPM, the BNSF beta was excluded, thereby  
20                 overstating the cost of capital. And finally, in  
21                 regard to market risk premium, as Robert said,  
22                 the Board used returns back to 1926, which I

1 think are inappropriate, because it was before  
2 the computer age, before the high-tech age. And  
3 I think a shorter time is needed, but still you  
4 need stability and you need a length of time.  
5 And I would recommend a fifty-year period be  
6 used. Still, in spite of those three overages,  
7 the record is clear. The DCF approach greatly  
8 exceeded the CAPM approach.

9 I also discussed in my opening  
10 statement why the CAPM is superior to the DCF.  
11 It reveals the choices through prospective  
12 investors. It goes to the primary risk-reward  
13 relationship that's at the heart of cost-of-  
14 equity capital. It uses readily available and  
15 comprehensive data published by experts, Wall  
16 Street analysts, financial firms throughout the  
17 country, there are many choices. Its components  
18 can be benchmarked against available standards.  
19 It's applicable to an industry with few major  
20 firms, like the railroads with four and only  
21 three that are publicly traded. And after much  
22 analysis it was adopted by the railroad's

1 commission in Canada, the Canadian Transportation  
2 Agency, as the sole determinate of the cost of  
3 capital. It works in Canada and it could work  
4 here.

5 For this hearing the Board asked five  
6 questions, which I'll briefly respond to. First  
7 it asks how to correct an MSDCF bias. Well it's  
8 kind of obvious to me. Get rid of it and rely on  
9 the CAPM. The growth rates, I think, in the DCF  
10 model are overly optimistic. I felt that way  
11 when I was at the AAR. They're kind of frivolous.  
12 I used to say at the AAR, well the Wall Street  
13 analysts who I talk to all the time are going to  
14 come up with a 15 percent growth rate no matter  
15 what the operating conditions in the railroad  
16 industry. You can plug in that growth rate and  
17 figure out the cost of capital. And I asked  
18 somebody else, how'd you come up with rate? And  
19 it was less than scientific. So I believe that a  
20 CAPM is the way to go.

21 The Board also asked for comments in  
22 using a beta of 1.0. Well two-thirds of the

1 industry is already at 1.0. You know, in the  
2 railroad industry, in many ways the business of  
3 the economy is a whole. When I was at the  
4 association, Alan Greenspan's office, the  
5 Treasury Department, used to call weekly for the  
6 railroad weekly traffic reports, because it was a  
7 concurrent economic indicator, and now with  
8 railroads attracting all this oil traffic and a  
9 huge increase in intermodal traffic, it's more  
10 like the economy than ever. So at a minimum, I  
11 think two-thirds of the risk factor in the CAPM,  
12 the beta, should be 1.0, and that a Blume  
13 adjustment should be made for the other one-  
14 third. But I would not be against just a market  
15 CAPM for the railroad industry with a beta of  
16 one.

17 Third, the Board asked about the  
18 appropriate market risk premium. I think, once  
19 again, using the base year of 1926 is  
20 inappropriate given technology in a computer age.  
21 I would recommend a fifty-year period. I would  
22 not object to even a shorter time frame.

1           Fourth, the Board asked if there's a  
2 need for more observations in the cost of equity  
3 calculation. Well there's only three now. So  
4 the obvious answer is yes. And how do you get  
5 those observations? You got to a CAPM and you  
6 rely on some larger array of companies like the  
7 S&P 500.

8           Finally, the Board asked about the  
9 appropriateness of replacement costs. I think  
10 that's been covered quite a bit. I look at this  
11 whole proposal of replacement costs as a  
12 distraction. It's sort of like having a brother-  
13 in-law who's out of work, kind of shows up  
14 constantly and there's no value to it. The ICC  
15 tried this --- I wasn't around --- in 1913 and  
16 kept it for twenty years. Billions of dollars  
17 were spent. You can go into the library here and  
18 look at all those old evaluation reports. The  
19 asset values changed the day after they were  
20 valued. The railroad spent a lot of money. It  
21 was thrown out and it was never any use for those  
22 evaluation reports at all, just billions of

1 dollars wasted.

2           Finally, I think that the board, when  
3 you consider the methodology here, you should  
4 think about benchmarking the results, sort of  
5 like a sanity test. I think there are two ways.  
6 You know the AAR quoted Professor Stuart Myer,  
7 who said only a fool ignores useful information.  
8 I agree with that. And there's some useful  
9 information that the Board, I think, can use to  
10 supplement your cost-of-capital calculation. For  
11 instance, the annual reports to shareholders, not  
12 the R1's and the proxy reports have a lot of  
13 information. In fact, in those reports the  
14 railroads reveal what their cost of capital is.  
15 They use peer-group analysis. It's almost like a  
16 comparative earnings test. Nineteen similar  
17 companies or companies with similar financial  
18 characteristics are compared against an array of  
19 financial indicators. And this is the way  
20 executives are paid. Eighty-five percent of  
21 executive pay in the railroad industry is based  
22 on long-term incentives rather than salary. And

1 the railroads state in these reports that they're  
2 aligning the interest of their shareholders with  
3 a long-term executive pay of their executives.  
4 Since in some years railroad earnings exceed what  
5 their peer groups earn, they've earned their cost  
6 of capital by osmosis.

7 In fact, the Union Pacific Railroad  
8 over the period 1911 to 1913 was first in the  
9 composite of all of those financial indicators  
10 relative to the peer group. Oh, I'm sorry. Did  
11 I say 19? Twenty, I'm sorry. That's a senior  
12 moment. And finally I think that you shouldn't  
13 ignore the market cost of equity capital. It's  
14 kind of easy to calculate because all the data is  
15 out there. You have a beta of one, you got a  
16 risk-free return, you can argue about you used  
17 twenty-year notes or ten-year notes, but let's  
18 assume it's four percent. In a risk-free return  
19 that's published by several firms, it could be  
20 four and a half percent. So there's an eight and  
21 a half percent return on equity as a standard  
22 from which the Board can use as a point of

1       deportation. You can ask yourself why should the  
2       railroads be any different than the market cost  
3       of equity capital.

4               The bottom line is, at least in my  
5       opinion, the DCF approach just doesn't suit an  
6       industry with three observations. I didn't think  
7       it did when I worked in the industry, but it  
8       didn't matter. It didn't matter what the result  
9       was. Now it matters. The CAPM works in Canada  
10      and I think it should be the sole determination  
11      of a cost-of-equity capital here. Thank you for  
12      your time.

13              MR. TRIANTIS: Good morning. I'm Alex  
14      Triantis. I'm the Dean of the Robert H. Smith  
15      School of Business at the University of Maryland.  
16      I've been a finance professor for over 25 years,  
17      and in my research, teaching and consulting I've  
18      focused on the area of corporate finance.  
19      Particularly on the evaluation of corporate  
20      investments, which involves a determination of  
21      companies cost of capital. I'd like to emphasize  
22      in my remarks today, my views provided in earlier

1 written submissions, that the Surface  
2 Transportation Board should rely simply on the  
3 CAPM to estimate the cost of equity, but with an  
4 appropriately adjusted beta and with an MRP which  
5 is more reflective of current market conditions.

6 The current use of the MSDCF model,  
7 alongside the CAPM, particularly the way in which  
8 the MSDCF model is applied, introduces bias into  
9 the cost-of-equity determination. Let me  
10 highlight first why the CAPM should be used. It  
11 is not only transparent and based on strong  
12 conceptual underpinnings, but it is also by far  
13 the most commonly used method in practice. This  
14 is confirmed by several widely-cited studies of  
15 corporate finance professionals which also find  
16 that very few firms back up the cost of equity  
17 from a DCF model. In fact, in comparing survey  
18 results over time, it appears that the DCF method  
19 has fallen more out of favor as the CAPM has  
20 become more widely adopted. Also, companies that  
21 were selected by peers to be best in class for  
22 their practice of financial management are even

1 more likely to use the CAPM than alternative  
2 models to compute the cost of equity.

3 The most recent study of these  
4 practices that I've seen, conducted by the  
5 Association for Financial Professionals in 2013,  
6 finds that eight-five percent of organizations  
7 use the CAPM to estimate their cost of equity.  
8 While only four percent of companies back out of  
9 cost of equity from the dividend-discount model.  
10 Thus to the extent that the STB's objective is to  
11 track the practices of the financial community,  
12 the STB should utilize the CAPM. Furthermore,  
13 best practices of how to use the CAPM point to  
14 using an adjusted beta and an MRP reflecting a  
15 shorter historical time period than the current  
16 1926 to present MRP that is being employed by the  
17 STB.

18 Regarding the former, it is common in  
19 practice to use an adjusted beta. This is also  
20 called a Blume beta, based on Blume's findings  
21 over forty years ago that betas tend to revert to  
22 a mean of one. So this gives the historical beta

1 a weighting of two-thirds, and the average market  
2 beta of one, a weight of one-third. This  
3 weighting procedure is used by Bloomberg. It is  
4 used by Value Line and the 2013 survey of the  
5 Association for Financial Professionals confirms  
6 the widespread use of the Blume adjustment. If  
7 the STB's objective is to reflect the common  
8 practices of the investment community, then the  
9 STB should include such an adjustment. This  
10 adjustment should also contribute to stability in  
11 the STB's results over time, since this weighting  
12 procedure results in less year-to-year variation  
13 in beta estimates. It will lead to a beta that  
14 will be closer to one, which seems consistent  
15 with the nature of the railroad industry given  
16 its relatively correlation with the overall  
17 economy.

18           Regarding the market risk premium or  
19 MRP, a fifty-year period of estimating the  
20 historical MRP seems most reasonable. The  
21 estimation era of beta decreased with the square  
22 root of the number of observations points. This

1 means that adding incremental years after a while  
2 has diminishing returns in terms of statistical  
3 accuracy. In fact, any advantage from having  
4 more time-series data becomes outweighed by the  
5 disadvantages of extending too far back in  
6 history to time periods that are not really  
7 representative of current market conditions.

8 For instance, stock markets have  
9 evolved over time to be more liquid and more  
10 transparent, and this lowers the premium  
11 investors require to invest in stocks. Investors  
12 are now also better able to mitigate risk,  
13 including through better diversification using  
14 various types of funds that didn't exist fifty  
15 years ago. This too means that investors will  
16 require a lower risk premium on stocks now than  
17 decades ago. These considerations support why  
18 many believe that the market risk premium is  
19 lower now than it was several decades ago. The  
20 equity risk premium puzzle, which stipulates that  
21 historical measures of MRP are upwardly biased  
22 forecasts of future MRPs, is a well-known

1 phenomenon in the finance academic literature.  
2 Using fifty years' worth of historical data, the  
3 MRP estimated by Ibbotson, based on the  
4 arithmetic mean of returns is 4.7 percent. This  
5 figure is consistent with, if not somewhat higher  
6 than, that currently used by financial  
7 professional such as CFOs. The MRP from the  
8 Graham Harvey CFO Magazine Survey of CFOs has  
9 fluctuated over the past fifteen years in the 2.4  
10 to 4.6 percent range, with an average across all  
11 quarters of 3.5 percent, with the most recent MRP  
12 average estimate at 4.5 percent. By the way,  
13 this MRP is based on the excess return over ten-  
14 year Treasury bond rates. So one would expect a  
15 lower MRP if measured relative to the twenty-year  
16 T bond rate as currently used by the STB. In the  
17 2013 AFP survey, the MRPs used by financial  
18 professionals averaged somewhere between four to  
19 five percent. Again, this is consistent with a  
20 fifty-year historical MRP estimate.

21 So now let me turn to the MSDCF  
22 approach to estimating the cost of equity. The

1 underlying concept behind DCF valuation is sound.  
2 Using a DCF model for evaluation, given a set of  
3 inputs including the discount rate, is standard  
4 fare. However, what the STB seems to do is to  
5 use a simplified version of the DCF model in  
6 order to back out one single input, mainly the  
7 discount rate. My general concern with his  
8 approach is that when you're trying to back out a  
9 particular input variable from a model that has  
10 many input variables you better have very high  
11 confidence in the other input assumptions.  
12 Otherwise, you're essentially taking all the  
13 errors in the other input variable assumptions  
14 and then channeling these errors into the one  
15 estimate, the estimate of the single variable  
16 that is being backed out, namely the discount  
17 rate in this case.

18 For instance, overestimating growth  
19 rates perhaps based on an assumption that current  
20 growth rates in an industry will be sustained for  
21 a long period of time will result in overestimate  
22 of the implied discount rate. While one might

1 hope that maybe the errors in the other input  
2 estimates will somehow cancel out, this is not  
3 the case for reasons I will expand on soon. As a  
4 short passing comment, it is interesting that  
5 many practitioners back out growth rates from a  
6 DCF model rather than the discount rate. This  
7 implies that they believe that the growth rate is  
8 harder to estimate than the discount rate for  
9 which they simply use the CAPM.

10 Using the MSDCF model to back out the  
11 discount rate makes very strong assumptions that  
12 the MSDCF model is what investors use to value  
13 stocks, and that we know what growth rates and  
14 other estimates they are using in their  
15 evaluations. I'll quickly enumerate some of the  
16 failings of this approach. First, rather than  
17 using careful forecast that cash flows from each  
18 year in evaluation time line, the approach takes  
19 to shortcut of assuming one growth rate for the  
20 first five years and another for the subsequent  
21 five years. While this three-stage DCF approach  
22 of having two stages followed by a final terminal

1 stage certainly simplifies the analysis, it is  
2 not one that stock analysts or companies would  
3 typically use to carefully evaluate an  
4 investment.

5           Second, the first stage growth rate  
6 for stock is based on the median of five-year EPS  
7 growth estimates provided by a few of the stock  
8 analysts covering the stock. The fact that these  
9 growth estimates typically vary widely across  
10 analysts, and that many stock analysts do not  
11 even provide long-term growth estimates given the  
12 difficulty in estimating them, should give one  
13 pause when considering the lack of reliability in  
14 these estimates.

15           Third, EPS growth is boosted by the  
16 effect of stock repurchases. Simultaneous  
17 adjustments to the cash flow that have been  
18 proposed appear to double count cash flow  
19 available to shareholders rather than truly  
20 addressing this problem. Fourth, the assumption  
21 surrounding the changes in growth rates are  
22 unrealistic. Since the second-stage growth rate

1 reflects the simple average of the median of the  
2 growth rate estimates for the individual carriers  
3 from the first five-year stage, if companies in  
4 an industry, especially small ones, are expected  
5 to experience a high growth rate for the next few  
6 years, the model then expects the industry to  
7 sustain such a high growth rate for the next ten  
8 years, which seems quite unreasonable.

9 Furthermore, allowing a single growth rate in the  
10 second stage that just drops suddenly at the  
11 terminal date seems quite unrealistic. An  
12 appropriately structured transition with a growth  
13 rate is phased in gradually toward the terminal  
14 growth is preferable.

15 Fifth, the type of cash flow earning  
16 metric that is used to calculate the terminal  
17 value differs significantly from that used in the  
18 first ten years. And it is upward biased, which  
19 means that too high of a discount rate will come  
20 out of the analysis. These errors or  
21 deficiencies in using the MSDCF model to back out  
22 a company's cost of equity highlight the risk in

1 relying on such an approach. While the MSDCF may  
2 appear to have the appeal of being able to  
3 potentially capture future expectations of the  
4 cost of equity, the application of this approach  
5 is fraught with error and that's unreliable. The  
6 issues raised above help to explain why the cost  
7 of equity estimates obtained using the MSDCF in  
8 recent years by the STB have been systematically  
9 higher than those based on the traditional CAPM  
10 approach.

11 In summary, while it may be enticing  
12 to try to try to hedge one's estimate by using  
13 multiple models, this only works if the models  
14 being used are appropriately applied and properly  
15 suited for this purpose. The MSDCF model was not  
16 built for estimating discount rates. It's a  
17 valuation model, and is being reverse-engineered  
18 to try to get a discount rate but without the  
19 necessary reliability in all the other input  
20 variables, which are difficult to estimate  
21 properly. The MSDCF discount rates backed out  
22 appear to be erroneously high and inconsistent

1 with those from the CAPM and the belief of CFOs.  
2 They are also highly variable over time, which  
3 further introduces more risk into the rate-  
4 setting process. In contrast, the CAPM is  
5 designed to estimate the cost of equity. It is  
6 very widely used in practice for this specific  
7 purpose. But best practices should be employed  
8 here, including using an adjusted beta and using  
9 a reasonable MRP that's based on the past fifty  
10 years of market data, which also seems supported  
11 by surveys of the very people that are making  
12 investment decisions in practice. Thank you for  
13 the opportunity to express these views today.

14 MR. NELSON: Good morning Chairman  
15 Elliott, Vice Chairman Begeman and Commissioner  
16 Miller. I am Mike Nelson, Transportation  
17 Consultant for Arkansas Electric Cooperative.  
18 With me is Eric Von Salzen, AECC's outside  
19 counsel. I'll be presenting for AECC today and  
20 Eric will chip in if any legal issues come up  
21 along the way.

22 Yesterday we talked about information

1 showing that functional revenue adequacy was  
2 achieved even before it was indicated by the  
3 Boyd's methodology. The Christianson study  
4 referenced dates like 1995 for the use of optimal  
5 amounts of capital by the railroads, and 2001 for  
6 achievement of revenue adequacy under the CAPM  
7 standard. The large merger premiums started in  
8 the mid- to late 1990s as well. So you therefore  
9 have before you considerable evidence, some of it  
10 in hindsight, but still authoritative, that the  
11 Board's methodology has lagged somewhat in  
12 detecting the achievement of revenue adequacy.  
13 This demonstrates the need for the review now  
14 being undertaken.

15           The AECC's involvement in the Board's  
16 cost-of-capital methodology dates back  
17 approximately eight years to the time of the  
18 Board's initial adoption of CAPM and its  
19 subsequent incorporation of MSDCF. From the  
20 outset we've tried to look carefully at the  
21 issues that may come up when those financial  
22 analysis tools, which are discussed in the

1 literature and applied in other industries, are  
2 applied to railroads. Railroads typically are  
3 able to wield large amounts of market power  
4 relative to firms in most other industries, and  
5 their earnings may vary over time in ways  
6 generally not seen in other industries due to  
7 factors that affect their exercise of market  
8 power. AECC therefore has focused largely on the  
9 market power issue and the way it may affect the  
10 result to produce by CAPM and MSDCF.

11 With CAPM we identified the issue that  
12 the methodology interprets differences and  
13 earnings as differences in risk, but includes no  
14 method to distinguish between changes and  
15 earnings that reflect true changes and risks from  
16 changes that result from changes in the exercise  
17 of market power. This led directly to a concern  
18 that changes in the exercise of market power  
19 achieved by the rail industry could be  
20 misinterpreted by the CAPM model as changes and  
21 risks that would be reflected in the estimated  
22 beta coefficient and thereby impact the estimated

1 cost of capital. When the Board first was  
2 looking at introducing CAPM, AAR's witnesses,  
3 including Stuart Myers, an internationally-  
4 recognized expert in finance, concluded that the  
5 rail industry was less risky than a market  
6 portfolio and therefore had a beta value of less  
7 than one. That was consistent with AECC's  
8 understanding that the Board's ability to meter  
9 the railroad exercise of market power provides a  
10 potential cushion against earnings reductions  
11 that generally is not available in other  
12 industries. So we basically agreed with AAR that  
13 the true risk of the rail industry was low, but  
14 we cautioned the Board that if over time CAPM  
15 values started to increase and produce a higher  
16 estimated cost of capital, the Board should look  
17 closely at the possibility that that was an  
18 artifact of an increasing exercise of market  
19 power.

20 The fact that Dr. Villadsen has  
21 replicated the growth and measured beta values  
22 does nothing to change this. Stu Myers knew what

1 it meant to tell the Board that the railroad beta  
2 was 0.8, and the Board has been provided no  
3 credible basis for believing that the entire risk  
4 profile of the industry has changed. So rail  
5 parties have tried to dismiss AECC's work as a  
6 result driven, but they apparently haven't read  
7 our material very closely because we also put in  
8 the writing that the converse would be true, that  
9 if something happened to curtail the rail  
10 industry's exercise of market power, CAPM would  
11 likely would estimate a lower beta and produce an  
12 artificially low estimate of the rail industry  
13 cost of capital. We left it as an empirical  
14 issue that would be determined by the numbers.

15 In our opening filing we showed that  
16 beta had shown a pattern of systematic increases  
17 since the time the Board first implemented CAPM.  
18 We also showed how this correlated with the  
19 increased exercise of market power by railroads.  
20 Indeed for all the rhetoric that has come from  
21 the railroads regarding their needs for capacity  
22 investment to support future traffic growth, the

1 fact is that their overall traffic volumes have  
2 been basically flat over a period of many years,  
3 and most of their growth in earnings has resulted  
4 from price increases that have increased the  
5 margin over cost for each unit of traffic moved.  
6 It would be hard to imagine a clearer  
7 demonstration of the exercise of real market  
8 power has increased in recent years and that it  
9 has had the artificial impact on measured data  
10 that we've been discussing.

11 AECC's recommendation on this was that  
12 the Board should cease its attempt to measure  
13 railroad specific betas and should use the Stu  
14 Myers testimony or some similar value that  
15 reflects the below-average true risk of the  
16 railroad industry. Alternatively, the Board  
17 should use the market level of risk by applying a  
18 beta factor of 1.0. AECC views MSDCF for  
19 railroads as even more problematic than using  
20 CAPM. As discussed in our filings, one of the  
21 most profound problems is that as applied it  
22 contains no provision to insure conformity

1 between the earnings projections upon which it is  
2 based, and the Board's obligation to curtail  
3 earnings above the revenue-adequacy level that  
4 Mr. Von Salzen discussed yesterday.

5 As a result, even when earnings have  
6 been above the revenue-adequacy level, the values  
7 used by the Board in the first and second stages  
8 of MSDCF have been based on projections that such  
9 earnings will experience robust further growth.

10 In other words, they're based on an implicit  
11 assumption that the Board will take no action to  
12 implement the finding of the coal rate  
13 guidelines, that carriers are not entitled to  
14 receive earnings above the revenue-adequacy  
15 level. Mr. Von Salzen has informed me that this  
16 would violate the statute.

17 We also have identified what I would  
18 view as somewhat of a math error in the third  
19 stage of MSDCF. Again, with reference to the  
20 coal rate guidelines, it would not be legitimate  
21 to assume long-term earnings growth in excess of  
22 the actual growth rate in the railroad's net

1 investment base. This is because the permissible  
2 level of earnings each year is computed directly  
3 from that value and not from any consideration  
4 related to general economic growth. Indeed,  
5 because of the natural monopoly characteristics  
6 of railroads, the Board's expectation should be  
7 that needed rail investment will increase less  
8 rapidly than the growth rate of the economy as a  
9 whole, and we've presented data showing that this  
10 is in fact the case.

11 The problems with MSDCF are so  
12 profound that we support WCDL's conclusion that  
13 it should be removed. In the event that the  
14 Board decides that retention of some form of  
15 MSDCF is needed, we've presented the somewhat  
16 draconian changes that would be required for  
17 MSDCF to conform to the coal rate guidelines.  
18 The Board in the past has justified using the two  
19 methodologies on the ground that this produces a  
20 more accurate result that is less prone to year-  
21 to-year fluctuations. However, the deficiencies  
22 in the two models basically guarantee that their

1 average will be inaccurate. And I'm sorry to be  
2 giving you more thermometers, but I composed the  
3 following examples before yesterday's hearing.

4 If you have a swimming pool where the actual  
5 water temperature is eighty degrees and pool  
6 thermometers where one measures high by five  
7 degrees and one measures high by ten degrees you  
8 get a more accurate reading from the one that  
9 reads eighty-five than by averaging it with the  
10 one that reads ninety. From the fact that MSDCF  
11 has produced higher values than CAPM for the  
12 entire duration of the time both models have been  
13 in use, it is a virtual certainty that they're  
14 not measuring the same phenomenon. And given  
15 that both are yielding results far above the  
16 market level indicated by whatever reasonable  
17 values used for the risk-free rate and market  
18 risk premium, they should be thought of like the  
19 thermometers. Picking the one that is least  
20 inaccurate and improving its accuracy is better  
21 than averaging the two flawed values.

22 This discussion is intended to form

1 AECC's response to the Board's questions  
2 regarding Ex Parte 664, MSDCF and the beta issues  
3 in CAPM. AECC defers to WCTL regarding the MRP  
4 value in CAPM. I also have responses to the  
5 Board's questions regarding the limited size of  
6 the sample used in the Board's CAPM analysis and  
7 the possible need for changes in the Board's  
8 determination of return on investment.

9 On the sample size issue, data for all  
10 of BNSF and for the U.S. operations of CPNCN are  
11 included from the analysis altogether on the  
12 basis of their non-railroad or foreign parent  
13 companies. In the case of BNSF this leads to  
14 understatement of the true industry cost of  
15 capital because it excludes the availability to  
16 BNSF of low-cost capital from its corporate  
17 parent. And I think WCPL also referenced that  
18 earlier. Since the time of BNSF's acquisition by  
19 Berkshire Hathaway, BNSF alone has accounted for  
20 over forty-eight percent of the increase in total  
21 net investment made by the entire Class I rail  
22 industry. While Dr. Villadsen has argued that

1 such things don't matter, the evidence appears to  
2 say otherwise. In their advocacy of using  
3 replacement cost in revenue adequacy, the  
4 railroads have overlooked a series of breaking  
5 problems with them after they proposed while  
6 mischaracterizing important features of the  
7 historical cost method. First of all, as Mr.  
8 Rosenberg mentioned, using replacement costs in  
9 the return on investment methodology would  
10 require estimation of a real cost of capital to  
11 avoid double counting the effects of inflation.  
12 This was found by the ICC to be one of three key  
13 practical difficulties that precluded the use of  
14 replacement costs when the ICC investigated that  
15 approach in the 1980's. While the railroads now  
16 cite the ability to estimate replacement costs in  
17 SAT cases and the theoretical benefits of using  
18 replacement costs, the board was aware of such  
19 considerations in 2008, and it declined to open a  
20 proceeding to investigate user replacement costs.  
21 Indeed, the railroads have been careful not to  
22 highlight the consequences the board envisions

1 from the one thing that has changed since 2008,  
2 the attainment of revenue adequacy. And I'll  
3 quote from the board's decision in 2008. "As the  
4 carrier approached or reached revenue adequacy,  
5 it would have every incentive to hold on to  
6 track, bridges, or other facilities that are no  
7 longer used or useful because the regulatory  
8 framework would allow it to earn a full return on  
9 the full replacement costs of those assets. The  
10 list of problems with replacement costs has  
11 become longer, not shorter, and the board should  
12 not reconsider its well-reasoned decision to stay  
13 out of that quagmire. Despite all the rhetoric,  
14 the railroads have not made a compelling case  
15 that there's anything substantively wrong with  
16 the use of historical costs or that replacement  
17 costs would improve the accuracy of the revenue  
18 adequacy calculations, even if their use were  
19 less problematic. With historical costs, an  
20 investment enters the investment base at the time  
21 and in the amount of the actual expenditure, and  
22 it is taken out only as the flow of depreciation

1 charges restores the invested funds to the  
2 investor. The funds that haven't been returned  
3 or in a market rate of return, the railroads  
4 never explained why the railroad would need more  
5 than a market return on the actual med investment  
6 it makes, or why differential pricing above that  
7 level would ever be justifiable.

8 Railroad investments do not need to  
9 provide the up side discussed yesterday by the  
10 railroad witnesses, because when they enter the  
11 investment base they are, in effect, backed by a  
12 license to exercise market power. Nothing more  
13 than that is needed. The one change the board  
14 should make in the return on investment  
15 methodology is to remove the double kind of  
16 inflation that has been introduced by the board's  
17 current practice of allowing asset values to be  
18 written up to the values prevailing at the time  
19 of mergers and acquisitions. Because inflation  
20 expectations are already embedded in the  
21 estimated cost of capital, writing up asset  
22 values to account for inflation produces a double

1 kind of inflation in the calculation of the  
2 needed return. As described above, this is one  
3 of the factors that has caused the rejection of  
4 replacement costs by multiple agencies, and it  
5 should cause the board to discontinue asset value  
6 write ups as well. This can be done without  
7 introducing any delay in implementing the changes  
8 in policies and practices required to recognize  
9 the attainment of revenue adequacy.

10 MR. ELLIOTT: Good timing. Thank you  
11 very much for your testimony. Mr. Rosenberg, I  
12 had a quick question. You mentioned earlier  
13 about the use of the S&P 500 for observations  
14 because of the limited amount of observations  
15 that are available today under our regs. Would  
16 we run into any issues legally by looking at a  
17 broader observation as opposed to just the  
18 railroad industry? Do you believe that that use  
19 of S&P could be, I guess, challenged in the  
20 courts?

21 MR. ROSENBERG: I think that may be in  
22 part a question for Dr. Levine. You need to be

1 able to justify the use of your data as its being  
2 reasonable. If you start from the basis that the  
3 observed data that reflect, for example, the  
4 exercise of market power and are not reflective  
5 of the inherent underlying risks, then under  
6 those circumstances you do have a basis, and a  
7 fine basis for using something else. And as Dr.  
8 Professor Triantis explained, its common practice  
9 to use a Blume adjustment, which is 2/3 observed  
10 data and 1/3 of the general economy data of 1.0.  
11 That's the standard practice, and that's plainly  
12 reasonable. So you're making a determination  
13 based upon the data that you have. You also need  
14 to, I didn't dwell on it in my statement, you  
15 also need to be concerned about the circularity  
16 in some of these factors as well, and again, that  
17 using the railroads to exercise the market power  
18 to enable them to further exploit their market  
19 power, and I think it's very reasonable to take  
20 some corrective action to that. I think Dr.  
21 Levine has something to add.

22 DR. LEVINE: Thank you. I think there

1 are two points here. First of all, in a way,  
2 because the board uses the Beta approach, the  
3 risk factor, you've already broadened out the  
4 market. The Beta is based on the variability of  
5 stock prices for an individual railroad relative  
6 to the market as a whole. So you're comparing  
7 all companies, and often it's the S&P 500 or some  
8 other broader index. So I don't think that in  
9 court it would be an unsuccessful venture. And  
10 second of all, if you think of what the cost of  
11 capital is, it's an opportunity cost, and what  
12 broader opportunities are there than all of the  
13 publicly held companies in the United States or  
14 the S&P 500. A potential investor looks at all  
15 of these things, all of the dividend returns, all  
16 of the risk free opportunities, maybe in  
17 annuities, although there is a slight risk there,  
18 and in the risk premium they have those records  
19 and their stock brokers have those records. So I  
20 think you would be on very sound ground, not  
21 being a lawyer, I'm reaching that conclusion.

22 MR. ELLIOTT: Okay, thank you. How

1 about, I understand your point with respect to  
2 the S&P. Do you think under our regs we could  
3 add in the Canadian railroads at the present  
4 time, and also do you think that would be a  
5 helpful thing to have those extra observations?

6 MR. ROSENBERG: That's not something  
7 that we've advocated or considered. I think one  
8 of the concerns would be are you using Canadian  
9 Railroad performance to regulate United States  
10 railroads? Mr. Nelson may have given that more  
11 thought and consideration, and he may have other  
12 views. Our concern is just using the three,  
13 four, or five United States railroads you have  
14 and coming up with the sound treatment of them.

15 MR. NELSON: My main concern from the  
16 work I've done is with the omission of BNSF  
17 because there's pretty clear evidence that they  
18 have easier access to capital than, perhaps  
19 easier access to capital than perhaps the ones  
20 that are included in your sample. I haven't  
21 really taken it any further in terms of thinking  
22 about inclusion of the Canadian ones. BNSF would

1 be a big concern for me.

2 MR. ELLIOTT: Okay, thank you. And I  
3 don't believe I was here in 2009 where we went  
4 through this exercise of looking at our cost of  
5 equity capital. And my understanding is at that  
6 time when we added in the MSDCF, well, I think we  
7 did a little bit subsequent, that the shippers  
8 were not necessarily opposed to it, and if that's  
9 correct, has something changed since then that  
10 the board isn't seeing in the economic  
11 literature, or is it based on what you've seen  
12 over the past six years?

13 MR. ROSENBERG: We were certainly  
14 opposed to the inclusion of the MSDCF back in  
15 2009.

16 MR. ELLIOTT: Okay.

17 MR. ROSENBERG: And I think we've  
18 opposed it every year since. In the rule making  
19 proceeding, the X party 664 sub number one, the  
20 AAR's expert witness, Bruce Hankel submitted a  
21 table reporting to show that very small  
22 discrepancy between the CAPM and the MSDCF going

1 backwards, and the implication is that that small  
2 differential would persist going forward. That  
3 was not the case. There's been a very  
4 substantial discrepancy, very different, I guess,  
5 statement is results may vary from past  
6 performance, and that's been true in the States.

7 MR. ELLIOTT: And following up on  
8 that, as you mentioned earlier in your testimony,  
9 those numbers have been coming closer together,  
10 the MSDCF and the CAPM, and my understanding is  
11 it's possible that they could even flip next year  
12 depending on what happens in the financial  
13 community. Does that change your outlook on the  
14 use of these models as they do start coming  
15 closer together and possibly start to flip?

16 MR. ROSENBERG: We don't know what the  
17 future is going to show.

18 MR. ELLIOTT: Of course.

19 MR. ROSENBERG: It's possible with the  
20 board's CAPM, which we believe is significantly  
21 over stated, particularly in the risk premium,  
22 and what happens with stock prices and railroad

1 stock prices relative to other matters, and what  
2 happens with the earnings per share projections.  
3 It is possible that the CAPM could come in higher  
4 than the MSDCF. We still believe that the CAPM  
5 is more accurate, but we think if, you know, any  
6 model can be poorly implemented, and, again, we  
7 urge the board to revise the CAPM and to get it  
8 in at a realistic level. When you're assuming a  
9 seven percent risk premium when there is  
10 substantial evidence that the market is using a  
11 five percent or less, that will greatly increase  
12 the prospect that the CAPM could come in higher  
13 than the MSDCF.

14 MR. ELLIOTT: So despite what happens  
15 in the near future, if CAPM and MSDCF flip, your  
16 preference going forward would be, based on the  
17 models that we use presently would be to use just  
18 solely the CAPM.

19 MR. ROSENBERG: Yes, but again, we  
20 urge you to implement the CAPM soundly, and we  
21 respectfully submit that the current approach is  
22 not doing that.

1 MR. ELLIOTT: Yes, but that wasn't my  
2 question. It's just based on the two models that  
3 we're using right now going forward. If we were  
4 just going to stay with those two models, your  
5 preference would be CAPM and not MSDCF?

6 MR. ROSENBERG: If you're asking me as  
7 I sit here today, yes, but you're basically  
8 asking me to choose between a pretty poor model  
9 and a mediocre model. That's essentially a  
10 Hobson's choice.

11 MR. ELLIOTT: Okay. Okay, you got it.  
12 And let me ask --

13 MR. VON SALZEN: And, chairman, could  
14 I just --

15 MR. ELLIOTT: Yes, sure.

16 MR. VON SALZEN: That thing that I  
17 answered, I think part of the problem is that we  
18 see, and everybody at this table agrees that  
19 MSDCF can't be fixed to do the job that you want  
20 it to do. CAPM can be fixed, but it needs to be  
21 fixed. The way it is now it's not doing the job  
22 that you want it to do, but it can be fixed. So

1 it is a Hobson's choice in the sense that we  
2 wouldn't want unfixed CAPM, wouldn't want much  
3 more, we'd like the unfixable MSDCF. What we  
4 really want is a good model, and we think you can  
5 fix CAPM so that it is the model that will do  
6 what you want it to do.

7 MR. NELSON: Can I jump in to answer  
8 your

9 MR. ELLIOTT: Yes.

10 MR. NELSON: I think original question  
11 related to the shipper positions back when MSDCF  
12 was introduced, AECC expressed concern at the  
13 time with both methodologies, and it has taken  
14 the passage of time to see the actual results  
15 play out to be able to talk about them, you know,  
16 the empirical, this is what has happened kind of  
17 thing. But if you go back to our presentation  
18 back then, we presented because of our findings  
19 about the market power effects. We presented a  
20 scenario that if the board came to a point of  
21 potentially doing something about the exercise of  
22 market power, concluding that it was time to

1 start tightening up or pulling back on the reigns  
2 on market power, it prospectively would affect  
3 the analyst expectations that go into MSDCF in a  
4 way that the MSDCF numbers would go down and it  
5 would affect the data used in the CAPM analysis  
6 in a way that CAPM would conclude that the  
7 railroads were now experiencing lower risks  
8 because the market power effect would be  
9 translated to the beta and interpreted as risk,  
10 so that if you were to pull back the reigns you  
11 would cause both methods to nosedive and  
12 potentially go below the true value. So what we  
13 highlighted back in 2007 and 2008, I think 2008  
14 especially was the instability of both measures  
15 over time and the way they could be affected by  
16 the types of changes that you properly are  
17 considering now, and I think the advantage of  
18 going to something like a beta of 1.0 or  
19 expanding the field of view, at least, in the  
20 calculation of beta to get outside of the rail  
21 industry is that you insulate yourself from those  
22 scenarios and have a measure that was both stable

1 and defensively closer to the true value that  
2 you're trying to measure.

3 MR. ELLIOTT: Okay, and one last  
4 question. Utilities are obviously regulated on  
5 their own. Is there any situation on this panel  
6 in the past where utilities have argued in the  
7 arenas where they're regulated for the use of  
8 MCD CF? I think it was touched on earlier, but I  
9 just wanted to hear from you myself that if  
10 that's been argued differently in another forum.

11 MR. NELSON: Yes, I'm aware of AECC  
12 has made use of MSDCF as it is used in FERC, but  
13 AECC's position here has not been to opposed  
14 MSDCF on theoretical grounds, but rather on the  
15 application problems that it's had in the rail  
16 industry.

17 MR. ROSENBERG: I haven't studied what  
18 every lead member may have said at FERC, or  
19 particularly at the state public utility  
20 commission, but the AER has done extensive mining  
21 of that. It wouldn't surprise me that a  
22 pervasively regulated electric utility before a

1 PUC would advocate for DCF or MSDCF approach,  
2 either alone or in conjunction with other  
3 approaches. But I tried to explain why electric  
4 utility regulation differs so much from railroad  
5 regulation, and what why what may be appropriate  
6 in the former situation would not be appropriate  
7 in the latter.

8 MR. ELLIOTT: Thank you.

9 MS. BEGEMAN: Thank you, I'll go out  
10 on a limb and just say you've managed to make a  
11 really boring issue somewhat interesting, so  
12 thank you for that.

13 MR. ROSENBERG: I've got people back  
14 at the office that will be shocked by that, so  
15 thank you very much.

16 MS. BEGEMAN: Well, you served your  
17 clients well. I don't have a lot of questions.  
18 You certainly, throughout your many filings and  
19 your testimony, have made your positions really  
20 clear. I know I would benefit if we actually had  
21 had a debate among the two sides at the same  
22 table. I think that would be really interesting,

1 to have the two different versions, different  
2 viewpoints discussed at the same time. So, maybe  
3 for our next hearing we can do that, or we could  
4 extend it for another day. Luckily I'm not in  
5 charge.

6 Professor, could you just comment a  
7 bit more? I think you said that the multi-stage  
8 DCF results in a 32 percent, that it's 32 percent  
9 higher than using CAPM. Could you just elaborate  
10 a bit on that? I don't know if that is  
11 collectively or what that figure was. I thought  
12 it was from you, but it might have been from a  
13 utility.

14 MR. ROSENBERG: I think Dr. Levine  
15 presented that figure, and I don't want to steal  
16 his thunder, but I think that's taking the  
17 average of the MSDCF cost of equity values and  
18 comparing it to the CAPM, excuse me, the board's  
19 MSDCF CAPM values over a period of six years.

20 DR. LEVINE: Six years.

21 MR. ROSENBERG: I believe, and so it's  
22 been thirty-two percent higher. That average

1 also includes 2013, I believe, when the values  
2 were much closer than in the other years, if you  
3 look at just the five years, the figures in  
4 excess of forty percent. And, again, that  
5 involves a CAPM value that we believe is  
6 substantially overstated itself.

7 DR. LEVINE: Can I just add something  
8 to that? Because when you're an economics  
9 student, a very stential subject, may I say, you  
10 learn that either of these models, and there's a  
11 third called comparative earnings, should  
12 approximate about the same answer, but during  
13 that six year period there was not only a thirty-  
14 two percent difference. In one of the years the  
15 difference was sixty-five percent, and it's that  
16 kind of result, I think, that should trigger the  
17 board to ask questions. How can one model  
18 produce such a wide variance over the other? And  
19 that might lead you to what I had recommended, a  
20 benchmarking, the sanity test approach to looking  
21 at your results.

22 MR. ROSENBERG: Actually, if I can

1 link back to something I said earlier to Chairman  
2 Elliot in terms of what the league's position  
3 was, it was in part that if there was going to be  
4 an MSDCF, it's, you know, it should be reconciled  
5 with the CAPM value, and that would be to  
6 consider which seemed to be more accurate and  
7 reasonable under the circumstances as opposed to  
8 an automatic blind average, which is the approach  
9 that the board adopted. And I apologize for  
10 intruding, but I thought it would link back.

11 MS. BEGEMAN: You're welcome to  
12 intrude, that's not a problem. Could you help me  
13 get a better understanding, using the 1926 data  
14 versus the 50 year which you are advocating?  
15 What is the outcome difference? How skewed, in  
16 your view, is the Board's calculation? I mean,  
17 number wise? We're off by -- how wrong are the  
18 results in your mind by using the calculation  
19 that the Board is currently using?

20 MR. ROSENBERG: Well, if the average  
21 going back to, arithmetic average going back to  
22 1926, I believe, is around seven percent. If you

1 go back fifty years you're closer to 4.7 percent,  
2 I believe. And my two experts may have something  
3 to add to that.

4 DR. LEVINE: Well, I don't think this  
5 one is results oriented. I don't think the other  
6 ones are actually, because what you have to think  
7 about, no matter how many years using this  
8 calculation, you're giving equal weight to every  
9 individual year, and do you want to give equal  
10 weight to the years in the 1920's and 30's and  
11 40's before there was such international trade  
12 and computers and high technology? So, at a  
13 minimum, I think you ought to start your base  
14 year after World War II. I never looked at the  
15 differences and what the result would be from  
16 1926 through the fifty-year period . I think  
17 it's irrelevant, but I may be curious, but I  
18 think it's irrelevant to the decision as to what  
19 you want to use.

20 MS. BEGEMAN: Well, I don't disagree  
21 with you on that, but I'm just really trying to  
22 understand, is it extremely off or is it close?

1 Is it a difference of twenty percent?

2 DR. LEVINE: Right, I understand.

3 DR. TRIANTIS: So I won't comment on  
4 that specifically, but rather just to sort of  
5 reinforce that, yes, the markets were very  
6 different back from 1926 for about fifty years,  
7 and it's well known, the financial literature,  
8 that if you have more liquidity risk, investors  
9 need a higher rate of return. If there's less  
10 transparency, not as good disclosure, you need a  
11 higher rate of return. If you can diversify  
12 risk, you need a higher rate of return. And all  
13 of those are characteristics that were in that  
14 first fifty of the last hundred-year period that  
15 have changed dramatically in financial markets  
16 over the last fifty years, and that's why I had  
17 forgotten what the number was back in 1926. But  
18 I'm not surprised where we're seeing such a  
19 difference, which is a large difference, between  
20 those first fifty years and the most recent fifty  
21 years, which are much lower. There's, as I said,  
22 this risk premium puzzle is very heavily studied

1 effect in the financial literature. There's a  
2 lot of reasons that have been given why, going  
3 forward. Risk premium are lower than where they  
4 have been in the United States. And by the way,  
5 it's only been the United States if you studied  
6 internationally. We haven't seen those kind of  
7 high risk premiums in any developed country other  
8 than the United States, and as reasons why, that  
9 is believed to be an anomaly. So I could go on  
10 and on on that, but it is a relevant difference.

11 MR. ROSENBERG: I'll go on just a  
12 little bit. It's not merely that fifty years is  
13 the magic number, it's that that 4.7 percent also  
14 aligns with the surveys, it aligns with the Duff  
15 and Phelps recommendation, it aligns with what  
16 morning star uses. So it's ideally what you want  
17 is something that looks forward because investors  
18 act on the basis of expectations, you know, past  
19 performance can help guide that, but, you know,  
20 you've had different inflation values in the  
21 past, and inflation is something you might take  
22 into account in developing the market premium as

1 well. We think that there's abundant evidence  
2 that is reflective of what investors are  
3 expecting today at the same time because it's  
4 historical and it's going back fifty years. It's  
5 a value that's going to be fairly stable.  
6 Because you wouldn't necessarily want the  
7 railroad cost of capital to gyrate substantially  
8 from year to year as a policy matter.

9 MS. BEGEMAN: That's all I have for  
10 now.

11 MS. MILLER: I agree with Ann.  
12 Actually, this has been quite interesting, and  
13 Dr. Triantis, and if you had had a white board  
14 and I could have every now and again stopped and  
15 asked a question I think I actually would have  
16 followed everything you said, which is pretty  
17 miraculous. So you all have talked about the  
18 Blume adjustment, and I have to say, this is all,  
19 like, new terminology for me. I mean, you know,  
20 certainly the staff had prepared us, but I know  
21 in the pleadings, AAR proposed an adjustment  
22 called the Fasicek, I don't even know if I'm

1 saying it right, F-A-S-I-C-E-K adjustment. I  
2 haven't heard you all say anything about that.  
3 Do you know what that is? How would it be  
4 different from the Blume adjustment?

5 DR. TRIANTIS: That doesn't ring a  
6 bell to me.

7 MR. ROSENBERG: I may be  
8 mispronouncing it. I thought it was Vasicek or  
9 something like that.

10 MS. MILLER: Oh, I'm sure you're much  
11 closer than I am in pronouncing it.

12 MR. ROSENBERG: It's a different form  
13 of adjustment. It's a more complicated  
14 calculation. Based upon everything I've seen,  
15 it's not commonly used over here if you go to  
16 value line and Bloomberg, it's a Blume adjustment  
17 that is used. The issue of the Vasicek, if I'm  
18 pronouncing it correctly, and the Blume  
19 adjustment was considered at some length by the  
20 Canadian Transportation Agency in deciding how to  
21 formulate it's approach, and is opted for the  
22 Blume adjustment. So we think that it's much

1 more standard and much more common. And  
2 particularly appropriate here, given the  
3 characteristics and the behavior of the railroad  
4 industry. Anything further?

5 DR. TRIANTIS: Well, now that you said  
6 Vasicek it did ring a bell.

7 MS. MILLER: Yes, sorry about that.

8 DR. TRIANTIS: That's fine.

9 MS. MILLER: I'm sure I butchered your  
10 name too.

11 DR. TRIANTIS: But I fully agree with  
12 Mr. Rosenberg, but, I mean, Blume adjustment is  
13 the standard adjustment that, again, was based on  
14 these papers back in the early 70's. It's fairly  
15 simple to understand that when you see betas that  
16 are higher than 1 they tend, over time, to come  
17 closer to 1 and when they're lower than 1 they  
18 tend to mean revert as well. And so this  $1/3$ ,  
19  $2/3$  waiting is a rough approximation, but it  
20 seems to work pretty well, given the data. This  
21 is a standard thing when folks go for their CFA  
22 training. This is part of the standard correct

1 CLEM. Again, you know, Bloomberg, Value Line,  
2 they all use that, so it really is the standard  
3 approach in the industry.

4 MS. MILLER: Thank you. So, Mr.  
5 Levine, I want to go back to this issue of  
6 replacement cost, and you compared it to, you  
7 know, the uncle you hoped wouldn't come to visit.  
8 But could you say a bit more about that? And  
9 here's what I'm wondering. So, the assertion  
10 yesterday was that everyone concedes that it  
11 would be better philosophically to use  
12 replacement costs. It's just that it's so  
13 difficult, and that's the only reason it's not  
14 been used. And I'm wondering, and as far as  
15 that's concerned, if others want to comment on  
16 that, I mean, would you share that view that the  
17 only reason to not do it is the complexity of it,  
18 or are there philosophical and practical reasons  
19 why it wouldn't make sense to use replacement  
20 costs?

21 MR. LEVINE: I think there are  
22 philosophical reasons why you should use it, even

1       though I would agree with the former about it  
2       being impractical. Replacement cost data is not  
3       published by companies. Rates of returns are not  
4       published based on replacement costs. They're  
5       published based on book value accounting costs,  
6       the language of the business community in North  
7       America. Cost of capital is an opportunity cost  
8       wherein we're trying to get into. It's a very  
9       elusive concept. We're trying to get into the  
10      minds of an investor, find out what's going to  
11      draw them into investing in a company. They're  
12      not hearing anything about replacement costs from  
13      any analyst, from any publication, from any  
14      published data, and annual reports, etc. So  
15      there is a practical reason also not to use it.  
16      Who knows, if one converted all of the book  
17      values to replacement costs throughout the United  
18      States, you may get the same answer for  
19      investors. We don't know, because we don't know  
20      what the replacement costs are. So on two  
21      scores, and very much again, as far as I'm  
22      concerned, it's a distraction from the real issue

1 of railroad adequate earnings and the real cost  
2 of capital. It's just a total distraction.

3 MS. MILLER: So, Mr. Nelson, I think  
4 you made this comment, but, again, if anybody  
5 else wants to explain it, and I think what you  
6 said was if you're going to use replacement cost  
7 then you have to use the real cost of capital  
8 because of this double counting of inflation.  
9 And so, one, I'd like to understand that better  
10 because I'm not sure I appreciated it, and  
11 secondly, when you say the real cost of capital,  
12 are you saying then you can't model capital the  
13 way we're doing it now or even the way you've  
14 recommended doing it?

15 MR. NELSON: Yes, you've --

16 MS. MILLER: But you have to, I don't  
17 know, go out and do some much more extensive  
18 record keeping?

19 MR. NELSON: It would be a thing where  
20 your flow chart would have a box that said, and  
21 then a miracle happens, and then what comes out  
22 the other side is my --

1 MS. MILLER: That's my favorite Tom  
2 Larson comic.

3 MR. NELSON: You have an estimate of  
4 the cost of capital that miraculously removes  
5 whatever the investor's expectations of inflation  
6 are at any given point in time in the real world  
7 data that you use to estimate the cost of capital  
8 as its done now. And that's not anything I'm  
9 inventing or, you know, introducing as a problem.  
10 It's been identified in the past assessments of  
11 replacement costs conducted by the ICC. And I'm  
12 not sure if that specific issue was talked about  
13 at any link by the RAPB or the GAO looked at this  
14 also, but it's an issue there, and it's an issue,  
15 as I mentioned, with the write up of the asset  
16 values because you're compensating them for the  
17 investment that's actually made at the time that  
18 it's actually made, and for the duration of time  
19 that the invested funds are left, you know, in  
20 play and not returned to the investor. But then  
21 when you come back at the same time and inflate  
22 the value of the asset, you're counting inflation

1 twice because you're letting the asset go up, but  
2 you're applying a rate of return that already  
3 included the inflationary expectations of the  
4 marketplace.

5 MR. ROSENBERG: I can add to that that  
6 the issue is specifically discussed in the  
7 railroad accounting principles board, and it  
8 comes out that way for the reasons that Mr.  
9 Nelson stated. I'll also add when it comes to  
10 the nominal cost of capital, and particularly  
11 with the CAPM and it's inputs, you know, there  
12 are benchmarks that you can find. There's a Duff  
13 and Phelps value. There's now, as of this year,  
14 a morning star value. If you start looking for  
15 the real cost of capital, you're not going to  
16 find those things and you're going to have to go  
17 through gyrations and it's going to be  
18 speculative. It's going to make your life much  
19 more difficult, and it's going to be much harder  
20 to come out at a reasonable number. And if you  
21 do everything right you should come out at the  
22 same point. I think there was testimony to that

1 affect in the early 80's to the ICC. I think the  
2 late professor George Gorde submitted the  
3 statement to that effect, I think, professor  
4 Myers may have also, not working for shippers,  
5 submitted a similar statement. And my partner,  
6 Kelvin Dowd addressed a replacement cost  
7 yesterday, but I don't think that we would rush  
8 to agree that it is the ideal or preferred way of  
9 doing things. The railroads do need an incentive  
10 to make capital investments, but when they  
11 actually make those investments it enters the  
12 rate day so it becomes part of ERPS, it becomes  
13 part of the depreciated asset investment base for  
14 assessing revenue advocacy, and that's the way  
15 that the regulation generally works in North  
16 America.

17 MS. MILLER: So I think you just  
18 answered the next question I was going to ask, so  
19 let me ask the question and make sure it's the  
20 answer. So the implication yesterday from the  
21 AAR was that our process for computing revenue  
22 adequacy doesn't properly account for the cost of

1 maintaining and sustaining the rail network, and  
2 I'm wondering what you would say about that?

3 MR. ROSENBERG: We, of course,  
4 disagree for the reason I stated. I think there  
5 was discussion of- -

6 MS. MILLER: And, excuse me, so,  
7 because I just want to be sure that I understand  
8 this. And so the reason that you stated, and I  
9 think what it meant, so correct my understanding,  
10 was that when the investment is made, sort of the  
11 way the process works, they're getting the credit  
12 that recognizes that on the investment side?

13 MR. ROSENBERG: Right, take for  
14 example, I think CSX discussed a bridge that  
15 needed to be replaced, perhaps as a result of the  
16 hurricanes. So they had a six million dollar  
17 value, and then maybe it was --

18 MS. MILLER: Two hundred fifty  
19 million, I think.

20 MR. ROSENBERG: Okay, it was a large  
21 value. When they made that investment it became  
22 part of their asset investment base, and so it

1 would enter into their assets for purposes of  
2 calculating ERC's cost, and also the investment  
3 base for determining revenue adequacy. If I can  
4 go on further, you know, the railroads are, in  
5 fact, asking for all of this money to be  
6 considered as invested today. When it's not  
7 invested today and it may or may not be.

8 MS. MILLER: May never be invested.

9 MR. ROSENBERG: Invested tomorrow.

10 MS. MILLER: Yes.

11 MR. ROSENBERG: To use, you know, a  
12 slightly, well, as a simplified example, suppose,  
13 and this is not intended to be a solicitation of  
14 bribery that you want a hundred dollars from me  
15 ten years from now. I could say yes, I'm glad to  
16 do that, but you need to give me a hundred  
17 dollars today. That's not the way business is  
18 done, but that's effectively what the railroad  
19 position is. Anyone else?

20 DR. LEVINE: I would only say that I  
21 don't think there's any evidence whatsoever that  
22 the railroads are under-capitalized. One only

1 has to take a look, as I said before, at the  
2 reports to see that they've made their quotas in  
3 regards to their target returns, rewarded their  
4 executives with maximum compensation, increased  
5 their dividends substantially. I don't think you  
6 do those things when you're under-capitalized.  
7 Now that's more anecdotal than formulaic, but I  
8 think it just adds to the discussion.

9 MS. MILLER: And then, finally, one of  
10 the issues that was raised yesterday by the  
11 railroads was this issue of deferred taxes. I'm  
12 wondering if any of you would like to say  
13 anything about that?

14 MR. ROSENBERG: I for one would be  
15 glad to. Deferred taxes are essentially a, you  
16 know, a benefit provided by the taxpayers.  
17 Because a railroad or other sorts of firms make  
18 an investment today, they don't have pay taxes  
19 today, they may have to pay those taxes sometime  
20 in the future. So it's, in essence, money that's  
21 invested that's forwarded by the taxpayers, and  
22 deferred taxes and regulation are typically

1 treated in two ways. One of them is an offset to  
2 the investment base, and that's what the board  
3 uses. There will be some instances where they  
4 are instead treated as a zero cost source of  
5 capital because, you know, the taxpayers are  
6 providing that money to let the railroads use it  
7 without cost. So it's, yes, it struck me as  
8 somewhat remarkable that railroads would be  
9 asking for a return on something provided by the  
10 taxpayers, which would have the affect of forcing  
11 the, you know, the public that ships goods, which  
12 for this purpose is co-extensive with the  
13 taxpayers to have to provide the railroads with a  
14 return on money that's provided free to begin  
15 with. I think that's remarkably presumptuous and  
16 is not consistent with other regulations, to the  
17 best of my knowledge. I don't know if Professor  
18 Triantis or others would have something to add to  
19 that.

20 DR. TRIANTIS: I wasn't there  
21 yesterday, so I don't think I want to comment on  
22 the context of that.

1 MS. MILLER: But do you know anything  
2 broadly about this issue, or I don't know, maybe  
3 there's not an analog in other businesses in  
4 terms of how they would handle deferred taxes,  
5 because, you know, I'm sure more than just  
6 railroads have gotten deferred taxes for  
7 investments.

8 DR. TRIANTIS: Well, I mean, I just to  
9 reiterate what Mr. Rosenberg said, I mean, these  
10 deferred taxes are viewed as an incentive to try  
11 to provide the ability to push cash flow, to  
12 accelerate cash flow to the present time, to push  
13 taxes to the future, and so they're already is  
14 sort of an incentive built into those.

15 MS. MILLER: Yes. Thank you.

16 MR. NELSON: AECC hasn't looked  
17 specifically at deferred taxes, so I don't think  
18 we have anything to add to what's been said.

19 MR. ELLIOTT: One last question.  
20 Yesterday on the railroad panel one of the  
21 economists pointed to a way to figure out  
22 replacement costs from, I think, a Department of

1 Commerce model.

2 MS. MILLER: Yes.

3 MR. ELLIOTT: And while the comment  
4 was made, I think there wasn't a lot of backing  
5 up of using that model, but I was wondering if  
6 that was so easy to use, obviously it would have  
7 been raised earlier, but I was wondering what you  
8 thought about that model and if it's possible to  
9 use that in place of what we do now.

10 MR. VON SALZEN: I'm not familiar with  
11 it before hearing about it at the hearing  
12 yesterday, and I haven't really had a chance to  
13 consider that.

14 MR. ELLIOTT: Sure. That's fair.

15 MR. VON SALZEN: If we come up with  
16 anything else, if AECC wants to submit something  
17 in the fourteen-day period you mentioned  
18 yesterday, if we think of anything useful.

19 MR. ELLIOTT: Thank you.

20 MR. ROSENBERG: We also are in a  
21 similar position, but I don't think that is at  
22 all what the railroads have proposed in a

1 proposal for the current replacement cost  
2 presentation, or in their past ones. They're  
3 talking to you about some sort of market based  
4 valuation that doesn't regularly occur.

5 MR. ELLIOTT: Okay, thank you very  
6 much. Thank you, I really appreciate your  
7 testimony and answering our questions.  
8 Appreciate it.

9 MR. ROSENBERG: Okay.

10 MR. ELLIOTT: Okay, why don't we get  
11 started with panel number II.

12 MR. ATKINS: Members of the board, my  
13 name is Ray Atkins. It's my pleasure to appear  
14 today on this panel on behalf of the Association  
15 of American Railroads to discuss the issues  
16 surrounding the cost of equity for the railroad  
17 industry. And given the highly technical nature  
18 of this debate, I'm especially pleased to be  
19 joined by Dr. Bente Villadsen from the Braddle  
20 (phonetic) Group. Dr. Villadsen is an undisputed  
21 expert in the field of finance. She received her  
22 Ph.D. from the Yale University School of

1 Management and holds joint degrees in economics  
2 and mathematics from the University of --

3 DR. VILLADSEN: Aarhus.

4 MR. ATKINS: Aarhus in Denmark. She  
5 has testified in numerous agencies on how to  
6 estimate the cost of equity, including providing  
7 detailed reports to regulators in Australia and  
8 Canada that we attached to our written testimony.  
9 Together, we'd like to try to frame the key  
10 issues that are raised in this record and explain  
11 why there is no basis for the board to depart  
12 from the sound approach it uses to estimate the  
13 cost of equity in the railroad industry. The STB  
14 has spent an extraordinary amount of time and  
15 energy grappling with how to estimate the cost of  
16 equity in the railroad industry. You previously  
17 held two different rule makings, six rounds of  
18 evidence, and several hearings on this question,  
19 and during those rule makings you invited  
20 comments from experts from the Federal Reserve,  
21 you heard from the U.S. Department of  
22 Transportation, you heard from world leading

1 finance experts, and at the culmination of that  
2 lengthy process you reached a very logical  
3 conclusion, which you stated, "If our exploration  
4 of this issue has revealed nothing else, it has  
5 shown that there's no single, simple correct way  
6 to estimate the cost of equity for the railroad  
7 industry, and countless reasonable options are  
8 available. And so the board settled on its  
9 existing approach to estimate the cost of equity,  
10 where it will use an average of two accepted  
11 finance models. A multi-stage DCF model and a  
12 capital asset pricing model. A CAPM model was  
13 designed by the agency in the first rule making.  
14 In contrast, the STB decided to adopt an off the  
15 shelf multi-stage DCF model that was published at  
16 the time by Morningstar and Ibbotson. The agency  
17 concluded that it was better to use an  
18 established independent method that was applied  
19 across a number of different industries than  
20 using one of the made for litigation models that  
21 had been submitted in those rule makings by both  
22 the railroad and shipper commenters.

1                   Now, Western Coal Traffic League has  
2 never been satisfied with the STB's approach for  
3 one very simple reason. The MSDCF model has been  
4 higher than the capital asset pricing model for  
5 the last few years. And so our first chart here,  
6 we think just sort of describes in a nutshell why  
7 we're here today, the light blue line on top  
8 shows you the estimate produced by your multi-  
9 stage DCF model. The dark line below shows you  
10 the estimate from your capital asset pricing  
11 model, and the line in red shows you the average  
12 of the two models used by the board since 2008.  
13 And as you can see, until the last two years, the  
14 MSDCF model estimates have been higher than those  
15 produced by CAPM. And that gap has prompted  
16 Western Coal Traffic League to complain  
17 vigorously about how the average, about this  
18 averaging approach that the STB uses, and they  
19 believe that the gap exists because the MSDCF  
20 model is overstating the true cost of equity.  
21 But another possibility that we have to consider  
22 is that the capital asset pricing model is the

1       problem child, and that it's actually  
2       understating the cost of equity because of the  
3       extremely low interest rates during that time  
4       period, driven down by aggressive federal  
5       monetary policies, and an unprecedented asset  
6       purchase program. But it could be that the cost  
7       of equity actually falls somewhere in between  
8       those two models, or it could be above those two  
9       models, or it could be below those two models.

10               All financial techniques used to  
11       estimate the cost of equity are inherently  
12       imprecise and produce a range of estimates. So  
13       in this second chart, this is a chart that the  
14       board itself produced in the AEP Texas case. And  
15       what it shows you is the estimates produced by  
16       five different models over a fourteen-year span.  
17       Now, your chart, when you produced it, it was  
18       black and white, so I introduced a little bit of  
19       color to help you pull out of there the capital  
20       asset pricing model from the multi-stage DCF  
21       model. And the line in red is the capital asset  
22       pricing model, and as you can see in the earlier

1 years in 1994, it was well above the results  
2 produced by a multi-stage DCF model, and then it  
3 fell down well below the results produced by a  
4 multi-stage DCF model. But the point is that all  
5 of these models are commercially available, are  
6 considered reasonable, are used by practitioners,  
7 and they produce a range of estimates. Indeed,  
8 the board has said in the, and this is not the  
9 first time where a shipper has advocated for the  
10 use of CAPM, just pointing to the difference  
11 between the two models. In the APCO rate case,  
12 the board said that we've recognized for years  
13 that there could be differences between the  
14 figures derived from CAPM and MSDCF, but that is  
15 part of the reason we decided to average the two  
16 figures to smooth out those fluctuations. We use  
17 an averaging method to diminish the chances that  
18 one model's results for the cost of equity is  
19 either too high or too low. So if we return back  
20 to the first exhibit and, you know, the truth of  
21 where the actual cost of equity lies is going to  
22 be elusive. There's no way to look backwards and

1 test whether these models are providing the  
2 correct or true estimate of the cost of equity.  
3 It's one of the unfortunate features about the  
4 cost of equities. It never reveals itself, even  
5 historically, so we can't even look backwards and  
6 figure out what the actual cost of equity was.  
7 But that's why there is overwhelming evidence  
8 about using multiple models as being superior to  
9 using a single model.

10 In the prior two rule makings you had  
11 on this subject, the comments from the Federal  
12 Reserve where you invited them to come to the  
13 board and talk about their experiences, and they  
14 told you to use multiple models to improve your  
15 estimated because each model provides you with  
16 different information. USDOT strongly urged the  
17 board to use multiple models, and in particular,  
18 they urged you to use an average of the capital  
19 asset pricing model, and the Morningstar Ibbotson  
20 multi-stage DCF model. Even Professor Hodder,  
21 who was the prior expert for Western Coal Traffic  
22 League endorsed using the MSDCF model together

1 with CAPM. Here's a quote from his testimony.  
2 "As I have indicated on several occasions, the  
3 benefits of obtaining estimates from both the  
4 CAPM and from a multi-phase DCF model is that  
5 they use different approaches to very different  
6 types of inputs." And, indeed, Chairman, you  
7 asked the question what was their position, and  
8 they told you they opposed the use of a multi-  
9 phase DCF model, but their own witness is on  
10 record in that hearing as saying, "I would  
11 suggest you mandate a multi-phase DCF model."  
12 Nothing has really changed since you went through  
13 that elaborate and exhausting rule making, two  
14 rule makings and six grounds of evidence to where  
15 we are today. Indeed, the FCC, just two years  
16 ago, also did its own inquiry looking out to see  
17 what is the best practices, how should they  
18 estimate the cost of equity, so they canvassed  
19 the practices and they canvassed the literatures,  
20 and once again they concluded that the best  
21 practice is to use multiple models because just  
22 using one alone creates the potential to bias the

1 results and introduce significant error into your  
2 estimate. The AER submits that it would be a  
3 serious economic and public policy mistake for  
4 you to jettison the multi-stage DCF model as  
5 urged by Western Coal Traffic League. So what  
6 I'd like to do now is turn the presentation over  
7 to Dr. Valladsen and she's going to explain why  
8 there really is no reason to think that the MSDCF  
9 model is understating the cost of equity, and why  
10 academics and practitioners are concerned that  
11 the capital asset pricing model may itself be  
12 understating the cost of equity in our current  
13 financial environment. So, Dr. Valladsen?

14 DR. VALLADSEN: Thank you very much.  
15 It's an honor to be before the board today, thank  
16 you. Before we get any further into it, I want  
17 to talk a little bit about what the models  
18 actually do. So let's first take a look at the  
19 capital asset pricing model. The capital asset  
20 pricing model looks to the railroad industry's  
21 relative to that of the market. That is, it  
22 determines the cost of equity as a risk-free way

1 which is measured in the old market, and a market  
2 with premium multiplied with a systematic risk of  
3 the railroad industry. That is, it is a specific  
4 measure of the risk for the railroad industry,  
5 not for the market. That is the key of that  
6 model. As implemented by the board, the capital  
7 asset pricing model takes the current market risk  
8 premium and looks to beta's estimate over the  
9 most recent five years, and a historical market  
10 risk premium. In other words, much of the inputs  
11 are historic in nature. In turn, let's look at  
12 the MSDCF. The MSDCF takes the current stock  
13 price and determines it as a discounted value of  
14 future cash flows. The future cash flows can be  
15 predicted based on the current cash flow to which  
16 we apply a growth rate. The custom equity, which  
17 is the R in my little map I put up here is in the  
18 discount rate. So in other words, it's  
19 determined implicitly from this formula. I  
20 should say now that cash flows we are looking at  
21 in this case are cash flows that are specific to  
22 the railroad companies, and the stock prices are

1 offered specific to the railroad industry, as is  
2 the growth rate. So much of this is specific to  
3 the railroad industry, but the growth rates are  
4 forward looking in nature, not historic in  
5 nature. Then there's also growth rates that's  
6 looking to the economy as a whole in this model.  
7 That's, of course, in market wide information.

8 Like all models, they both have pros  
9 and cons. And as Ray said, errors in estimating  
10 both of them. Therefore, I believe it's  
11 important that we take in as much information as  
12 possible and rely on more than one model. Let's  
13 next turn to the statement, the board asked us  
14 where the MSDCF is upward bias. And let's look  
15 at that question next. Before we get into the  
16 details, it's important to recognize what the  
17 MSDCF does. The MSDCF, as implemented by the  
18 board, takes a measure of current cash flows and  
19 then predicts it out in the future. That's what  
20 I've depicted in the light blue line.  
21 Specifically, this uses 2009 data, so it's a  
22 prediction of the future cash flows. What the

1 WUCTL criticizes is that the growth rate in stage  
2 one are too high because of shared buy backs.  
3 They also criticize that the growth rates in  
4 stage two are too high because rather than taper  
5 the growth rates from the industry's specific  
6 growth rates to being near the economy wide  
7 growth, it just uses the average of the industry  
8 growth that's in that stage too. If we implement  
9 the WCTL assets, and I should say I did that, the  
10 WCTL did not do this, we get the gray line that I  
11 just suggested to you here.

12 Now, I should mention up front that  
13 the fact that this railroads fall back year is an  
14 after the fact on exposed realization. There is  
15 no analyst out there that says we're going to buy  
16 back X, Y, or Z number of shares going forward,  
17 so it's in here in after the fact argumentation.  
18 Now, if we actually look at the after the fact,  
19 well, I say how much cash flow was actually  
20 available to the railroads? That is the red line  
21 I have here. My red line is that actual total  
22 cash available to the railroad during that

1 period. Clearly, it's higher, not only by what  
2 the WCTL wants you to believe it should have  
3 been, but also what the board's model predicts.  
4 Why is that? Well, first and foremost, growth  
5 rates turned out to be higher than expected.  
6 Second, as you can see on the left most side of  
7 this chart, the starting point for the cash  
8 flows, which in the board's model is smooth over  
9 the last five years, is below what it actually  
10 was, for the reason that if you smooth the growth  
11 over a period of time when you have an increase  
12 in industry, you're growing that asset out too  
13 low. And lastly, and that's actually a minor  
14 adjustment. There are sources of cash flows that  
15 are not included, and it's important to realize  
16 that the MSDCF is an equilibrium model, a model  
17 that intends to capture permanent components of  
18 cash flows, not temporary issues such as the sale  
19 of assets from the railroads or any other issues  
20 like that. It's not included. It's smaller  
21 amounts. There is estimate recognized in this  
22 2009 adjustment. No adjustments for any working

1 capital in this model. So, therefore, it's a  
2 more temporary issue and we start to look. In  
3 other words, there was more cash available than  
4 actually what both the WCTL predicted and what  
5 the board's model predicts.

6 I will next address the WCTL's  
7 criticism, and specifically show you what would  
8 happen if we take an economically sound and  
9 consistent method and actually implement their  
10 suggestions. What would be the cost of equity if  
11 we go out and say let me try to take WCTL on  
12 their word and implement those suggestions and  
13 see what happens. Again, I should say I did  
14 that, the WCTL did not do that. The left most  
15 column here shows the MSDCF as implemented by the  
16 board. The second column says, okay, the WCTL  
17 said we should smooth the growth rate from  
18 growing from the industry specific growth to near  
19 the economy wide growth over a period of time.  
20 Let us do so. If I do so, I also need to take  
21 into account that if growth is going to go down  
22 to an economy wide growth, we will also expect

1 that the industry's capital expenditures will  
2 reach replacement costs only. There should not  
3 be any growth in capital expenditure other than  
4 replacing current capital. So that also has to  
5 take place. Doing so results in a reduction in  
6 the cost of equity estimate, on average, as you  
7 can see, but it's not a huge reduction in the  
8 cost of equity. And remember, again, only half  
9 of that change will go into the model as  
10 currently relied upon by the board because you  
11 put half weight on this and half on the capital  
12 asset pricing mode.

13 Next, the WCTL criticized that the  
14 share buy backs leads to over statement of the  
15 growth rate. And my response to that is, well,  
16 if we are to sort of reduce the growth rates  
17 corresponding to the shared buy backs, which we  
18 only now exposed, we also know exposed, as I  
19 showed you in the prior slide, that there was  
20 significantly more actual cash available to the  
21 railroads than what is in the model. So let's  
22 approximate that amount also. And we did that in

1 the share repurchase scenario as I put up here.  
2 Looking to that, I'm now back to, on average,  
3 14.5 whereas the board's model showed 14.9. So  
4 that's not a huge amount of difference, 0.2 if  
5 you average for the capital asset pricing mode.  
6 So, what I take from this is that if we  
7 economically consistently take the WCTL's  
8 criticism into account and try to accurately  
9 model what that would mean, that's not a model of  
10 difference to your actual model. It is not a  
11 huge discrepancy we're finding. The last column  
12 I have, column four, in this chart shows you that  
13 there might be some arguments about what exactly  
14 the whole bias and to what which the railroad to  
15 reach a steady state. In other words, how long  
16 will it take before the railroads needs to only  
17 put in replacement count? How long will they be  
18 in a growth mode? And instead of assuming, as  
19 the current model does, that that's in year '11,  
20 this assumes that's in the year '16. So expand  
21 it by five years and see what happens. It makes  
22 a small difference, not a huge difference, again.

1           The key takeaway from this slide is  
2           that the WCTL's criticism on the MSDCF is  
3           selective. They criticize the growth rate, they  
4           criticize some of the cash flow determinations,  
5           but if you want to go out and try to adjust for  
6           some ex-post or after the fact realizations, you  
7           need to look at all of the component that has  
8           changed after the fact. You can't just fix one  
9           part of the model, you need to fix them all. And  
10          if we do take it into account in an economic  
11          consistent manner, and internally model internal  
12          consistent, it is really not a big difference. I  
13          do want to say that this is not a proposal on  
14          anything for the board to change. This is simply  
15          showing you the impact of some of the criticisms.  
16          I think the board's current model, which is an  
17          equilibrium model, is far preferable to trying to  
18          nitpick each and every little component of the  
19          model. Let me next turn to a criticism you heard  
20          before, and you heard that Professor Triantis  
21          said that our implementation of the share buy  
22          back model appears to have double counted the

1 cash flows. Let me show you why that is not the  
2 case. Now I have overlaid on this chart I showed  
3 you before, my actually accounting for share  
4 repurchases. As you can see, my actually  
5 modeling of that fits the actual cash flows  
6 extremely well. There is no over counting. My  
7 line is actually slightly below that of the  
8 actual cash flows. You will also see that  
9 because I also account for tapering of the growth  
10 rates over time, my line is not as steep as that  
11 of the current MSDCF. That is the reason why the  
12 actual numbers turned out to be slightly lower.

13 Let me next turn to the capital asset  
14 pricing model. The board's questions regarding  
15 the capital asset pricing model all pertain to  
16 beta and the market was premium, and so did both  
17 the WCTL and the AECC's criticisms of the model.  
18 Therefore, I will focus on these two aspects.  
19 The board has asked whether it should set the  
20 beta equal to one or some other figure. The  
21 answer to that question is no. And my response  
22 to that is simply that what we are trying to do

1 in the capital asset pricing model is to measure  
2 the risk of the railroad industry relative to  
3 that of the market. If we do something else and  
4 set it equal to market, we are violating the  
5 fundamentals of the capital asset pricing model.  
6 So I would strongly recommend against any such  
7 thing. Similarly, should we decide to use the  
8 S&P 500 as a proxy for the market, again, that  
9 could be fundamentally wrong because we are  
10 trying to measure the relative risk of the  
11 railroad industry. The S&P 500 has many  
12 different types of companies, and it's currently  
13 quite dominated by financial institutions whose  
14 risk profile is very different from that of the  
15 railroads. The railroads are capital intensive,  
16 financial institutions are not.

17 And just following up on some of the  
18 comments that was coming up earlier where, I  
19 think it was Mr. Levine, who was suggesting that  
20 we should look into the BNSF. Well, while BNSF  
21 clearly is a railroad, using any beta from  
22 Berkshire Hathaway would be wrong because

1 Berkshire Hathaway is obviously a conglomerate  
2 consisting of many different types of businesses,  
3 including insurance and other financial  
4 institutions that has characteristics very  
5 different from that of the railroad industry.

6 Turning now to something that seems to concern  
7 the board: adjustments, betas, and adjustment of  
8 betas. As I explained in my report to the  
9 Canadian Transportation Agency, if we are going  
10 to adjust betas, using a Vasicek adjustment is  
11 far preferable because the Vasicek adjustments  
12 take into account the relative procession by  
13 which we have estimated the beta of the industry  
14 and the beta of whatever we're adjusting it  
15 towards. In other words, it looks at how sure  
16 are we about our estimates. That is preferable  
17 to using the Blume Adjustment. I should also say  
18 we've heard that everybody publishes Blume  
19 adjusted betas. Bloomberg actually publishes  
20 both Blume adjusted and unadjusted betas so  
21 that's not a waste.

22 Looking to the number of railroads,

1 which was also a question raised by the board,  
2 the current industry beta, and we estimated under  
3 the forced methodology that using a portfolio of  
4 whatever railroads classify as class one  
5 railroads. That's the way its currently done.  
6 It's one preferable to do it as portfolio  
7 compared to anything else because it would use an  
8 estimation error. Second, that portfolio  
9 includes the majority of the revenue that's  
10 generated by freight railroads in the U.S. and  
11 the majority of the freight volumes in the U.S.  
12 So it is representative of the industry. Lastly,  
13 I will address something that was raised again by  
14 both the AECC and the Western Coal Traffic League  
15 in their presentation, that somehow betas change  
16 if the market concentration of the industry  
17 increases. There's a good amount of academic  
18 literature looking to the relationship between  
19 betas and market concentration. There is no  
20 evidence that beta increases if the market  
21 concentration increases. Rather, the opposite.  
22 If there's a relationship, if market

1 concentration increases, beta stays high,  
2 although I would say the majority of the studies  
3 find that they can't statistically find any  
4 result at all. I would also state there could be  
5 many reasons why betas have increased. We know  
6 that the volatility in the railroad returns have  
7 changed over time, and especially they have  
8 increased relative to that of the market.

9 There's also been a significant change in the  
10 conversation of load that the railroad carries.  
11 I have not studied that in detail, but that is  
12 the areas I would focus on if I were to explain  
13 the increase in betas.

14 Looking next to the other aspects of  
15 the capital asset pricing model that we had  
16 talked about. We've heard quotes from Professor  
17 Myers before, and I will also provide you one.  
18 Professor Myers has cautiously noted that with  
19 extremely low current interest rates would change  
20 applications as a pricing model are likely to  
21 result in too low estimates. I'm showing you  
22 here a chart that shows you the square of the

1 difference between corporate bonds and government  
2 bonds. They're all twenty years, so they have  
3 the same maturity. What we can see from this  
4 chart is the difference on the return on a  
5 corporate bond and a government bond increased  
6 dramatically during the financial crisis from  
7 2008 and lasted until, say, 2012/2013. That was  
8 an elevated increase. What does that mean? It  
9 means that the return investors expected to  
10 receive by investing in corporate securities  
11 relative to treasuries of government securities  
12 increased during that period of time. In other  
13 words, it's an indication that the market risk  
14 premium was increased, because remember, the  
15 market risk premium is the difference between the  
16 return on equities and the return on risky rates  
17 of treasuries. So that's an indication.

18 Another chart here, we've heard much  
19 about the market risk premium, and this chart  
20 shows you first the middle column is simply the  
21 annual historical market risk premium as  
22 calculated by the board. And there are many ways

1 to look at the market risk premium, but on the  
2 left-hand side, what I look at here is the market  
3 risk premium that Bloomberg estimates, it's a  
4 forward looking methodology, so it changes day by  
5 day and is estimated as a forward looking  
6 methodology. I also estimate that my own, that's  
7 on the right-hand side. But the thing I want to  
8 point to here is that if we look at this period,  
9 throughout the period the forward looking market  
10 risk premium is higher than the historical market  
11 risk premium used by the board. And it's  
12 especially elevated in 2012. You can see the  
13 difference, it's 8.86, 12.52, and Ableson data  
14 has 6.7. So it was elevated in that period.  
15 That is a forward looking and contemporaneous  
16 estimate of what investors inspect. What this  
17 shows me is that while the Western Coal League  
18 will have you believe that a market risk premium  
19 on top of five percent is excessive. Well, what  
20 this shows is certainly there are other estimates  
21 that are significantly higher than that. I am  
22 not recommending that you go to any of these

1 forward looking methodologies because they change  
2 quite dramatically over time. Instead, what I do  
3 believe is that an historical agnatic MRP is  
4 reasonable, reliable, and very commonly used.  
5 This also, and I'm going you back here to my  
6 chart that shows you the elevated scrap back in  
7 2008 to '12, that shows you that risk premiums as  
8 looking forward were elevated in 2008, also  
9 through '12. That might also indicate that the  
10 problem is not the multi-stage DCF, but the  
11 capital asset pricing mode is underestimated in  
12 these periods.

13           Lastly, let me turn to the question of  
14 multiple models. The academic literature agrees  
15 that the use of more than one model is  
16 preferable, and the chart we just showed you will  
17 illustrate why it is that that is. Here is a  
18 quote from Professor Myers, I think. I will end  
19 on that, that use more than one model when you  
20 can because estimating the opportunity cost of  
21 capital is difficult, and only a fool throws away  
22 useful information. I think we all would agree.

1           MR. ATKINS: Chairman Elliott, I have  
2 a couple of concluding remarks if you would  
3 indulge me.

4           MR. ELLIOTT: Of course.

5           MR. ATKINS: Thank you. I'll try to  
6 kick myself along. So the AR submits that the  
7 record makes three things fairly clear. First,  
8 that using multiple models is the soundest  
9 approach, and the one preferred by numerous  
10 academics and regulators. Second, that the use  
11 of this historical approach to estimate the  
12 market risk premium is sound, it actually falls  
13 below current independent forward looking  
14 estimates of the market risk premium. And  
15 finally, perhaps most fundamentally is no  
16 indication that the multi-stage DCF model is  
17 biasing the results. As I talked about earlier,  
18 it's frustrating, you can never actually look  
19 backward to determine how well a model predicts  
20 the cost of equity, but for the multi-stage DCF  
21 model, the key input does reveal itself. That's  
22 the total cash flows that Dr. Valladsen showed

1 you. So what we can do is we can look back and  
2 say if Western Coal Traffic League is right, the  
3 board's model should be predicting total cash  
4 flows that are well in excess of what you  
5 actually, what were actually realized. And when  
6 we do that, we actually can empirically test  
7 whether or not there's a disconnect in the key  
8 input in the multi-stage DCF model, and when we  
9 do that, it shows that Western Coal Traffic  
10 league was wrong, and not just a little wrong,  
11 that they were significantly wrong. But Western  
12 Coal Traffic League clearly disagrees with the  
13 position the AAR is taking, but I would note,  
14 that I was going to say, their members take  
15 different positions before their state  
16 regulators. We submitted testimony in November  
17 about how they were extolling the virtues of  
18 multi-stage DCF, about how they are warning  
19 against relying on a single model, and how they  
20 advocated market risk premium well above five  
21 percent. Well, since November we thought we'd  
22 canvas the literature to see have they made any

1 such statements more recently in 2015, and low  
2 and behold they have. So what are they telling  
3 their own regulators about using multiple models?  
4 I can't see power and light, just telling their  
5 regulator. It's prudent and appropriate to use  
6 multiple models in order to mitigate the effects  
7 associated with any single model. Or you can  
8 look at Kansas City Power and Light. It's  
9 essential to employ a variety of techniques. Or  
10 we can look at Entergy who says that no single  
11 approach can be relied upon as wholly reliable.  
12 Now, they, Western Coal Traffic League says,  
13 well, that maybe the markets there are different,  
14 and somehow the utilities are a little bit  
15 different than railroads and we can take  
16 inconsistent positions. But what are they  
17 telling their regulators about the market risk  
18 premium? Here there is no plausible argument  
19 that the market risk premium should be different  
20 for utilities than it is for the railroads. It's  
21 the market risk premium. It's the market risk  
22 premium for the whole market. Well, what are

1 they recently telling them? Well, that just two  
2 months ago, Kansas City Power and Light was  
3 advocating a future forward looking market risk  
4 premium of 10 percent. Wisconsin Public Service,  
5 just two months ago, in seven or eight percent.  
6 Entergy nine percent. Mid America seven percent,  
7 Ameren nine percent. Yet Western Coal Traffic  
8 League is telling you that the market risk  
9 premium in the current environment cannot  
10 possibly exceed 4.7 percent. Now, ultimately,  
11 the board will have to judge the credibility of  
12 the witnesses that come before you, but the AAR  
13 submits that the credibility of Western Coal  
14 Traffic League is severely undermined by its own  
15 members. We would submit they speak the truth to  
16 their own regulators while asking you to set  
17 aside best practices in the hopes of driving down  
18 the cost of equity. With that, we would be  
19 pleased to answer any of your questions.

20 MR. ELLIOTT: I just had one quick  
21 question that was related to a question that I  
22 asked earlier, and that I think that you touched

1 on in your testimony about increasing the number  
2 of railroads, and my question before to Western  
3 Coal Traffic League regarded the Canadian  
4 railroads and adding them into the mix, and if  
5 that would be helpful or not, and also I think  
6 this would be more to Mr. Atkins whether our  
7 present regulations would permit that.

8 MR. ATKINS: Well, I'll ask Dr.  
9 Villadsen, first to talk about the need, and then  
10 I'll speak to the legality.

11 DR. VILLADSEN: Well, first, I will  
12 note that we do have the majority of the freight  
13 volume and the majority of the railroads, which  
14 is a key point to me. You must have the majority  
15 of the industry. Second, that's a problematic  
16 issue with the Canadian railroads, and I have not  
17 studied them in enough detail lately to be fully  
18 coherent on this. But they face a different kind  
19 of regulation, and that might be problematic in  
20 that they might not be completely comparable, so  
21 we might have to make some adjustments if we were  
22 to include those. So, I would say at this

1 environment we currently have the majority of the  
2 freight volume, so that probably is a reasonable  
3 approach at this for environment.

4 MR. ATKINS: And I'd think that our  
5 position would be is it would be a mistake both  
6 on matter of policy and law to be including the  
7 Canadian side of it. You're trying to determine  
8 the risk profile of the American Railroad  
9 Network, and so including the risk profile of the  
10 Mexican railroad is different than the risk  
11 profile of the American railroads. The risk  
12 profile of the Canadian railroads is different.  
13 They live in different environments, they face  
14 different financial considerations, they have  
15 different marketplaces. And so to import the  
16 cost of equity from Canada or Mexico, or you  
17 could look in Europe at railroads overseas. We  
18 feel that there's no need to expand the portfolio  
19 of railroads that you looked at to include the  
20 Canadians and as Dr. Villadsen notes, we don't  
21 think it actually would have a material outcome  
22 on the estimates even if you were to travel down

1 that path.

2 MS. MILLER: Wouldn't it be possible,  
3 though, to look at the Canadian railroad just in  
4 terms of their U.S. operations? I mean, they say  
5 they operate separately in the U.S. from Canada,  
6 they filed taxes in both countries and separate  
7 out their operations, so why is it not possible  
8 to look? We look at KCS in this country, but not  
9 in Mexico.

10 DR. VILLADSEN: On forth noting, what  
11 we do when we estimate the cost of equity we look  
12 at the market data. So we need to have something  
13 that's traded like the stock prices trading  
14 issue, and the Canadian railroads have only one  
15 stock to trade, so they don't have one in each  
16 country, so we can't do that.

17 MR. ATKINS: It's a very good  
18 question, if they were separately trading the  
19 American portion of it, and it had separate stock  
20 price, then we could easily add them into the  
21 group, but they don't, it gets woven into a  
22 single stock price for the whole company.

1 MS. MILLER: Could you say a bit more  
2 about why you're not concerned about the small  
3 number of railroads? And let me play this back  
4 and be sure I'm getting it correctly. You're  
5 saying that even without BNSF relying on the  
6 other three, four railroads, you have the  
7 majority of freight movement and majority of  
8 revenue or cost, I can't remember how you were  
9 saying it, is that correct even when you take  
10 BNSF out?

11 DR. VILLADSEN: That's correct. So  
12 you have the majority of the industry even when  
13 you take BNSF out. As it's in --

14 MS. MILLER: It's an awfully big  
15 player to take out, though, don't you think?

16 DR. VILLADSEN: Yeah, and if it --

17 MS. MILLER: And, you know, one of the  
18 things WCTL said, and you know, maybe this is  
19 just a snapshot in time, and maybe in some ways  
20 it doesn't go into this calculation, but BNSF  
21 accounted for something like forty-three percent  
22 of the capital investment in railroads. I mean,

1 that's almost fifty percent of the capital  
2 investment is coming from the one railroad we're  
3 not even counting. And, excuse me, and I really  
4 will give you a chance to answer. And then on  
5 top of that I think, you know, one of the  
6 concerns isn't just without BNSF in it, can we  
7 move forward, but what would happen if we lost  
8 another railroad, which is certainly not like a  
9 crazy scenario that's likely to never happen,  
10 it's a reasonable concern and a reasonable  
11 scenario.

12 DR. VILLADSEN: So let me address  
13 first the capital expenditures.

14 MS. MILLER: Uh huh.

15 DR. VILLADSEN: That is true that PNSF  
16 has accounted for the majority of that, which  
17 probably, if anything, would lead us to have an  
18 under estimation of the MSDCF numbers because  
19 they have had a higher growth relative to the  
20 other railroad. So we have tightened that out.  
21 We also have taken it out of the capital as a  
22 pricing model for most of these purposes. My

1 real concern is to make sure I have enough of the  
2 industry. I want to have the majority of the  
3 industry. That's my number one concern. If you  
4 ask me as a statistician, I would love to have  
5 twenty railroads to do my estimation on. That's  
6 not going to happen. So my concern then becomes  
7 what is the best alternative, and my alternative  
8 currently is to go for some very small line haul  
9 railroads, go to the Canadian, or go to the  
10 Mexican railroad. That's my alternative  
11 currently, because I do need a company that is  
12 properly traded so I can do any estimation on it.  
13 And I'm not sure that the Canadian railroad's  
14 regulation, or that even worse, the Mexican  
15 railroad regulation is such that you accurately  
16 can compare it to the U.S. railroad industry.  
17 And if you look specifically at the Canadian  
18 railroad it wouldn't make much of a change  
19 actually in the beta estimates. The betas are  
20 very close to that of the U.S. Their growth  
21 rates are actually slightly higher.

22 MS. MILLER: So say more about why you

1 reject the idea of the S&P 500. I mean, I  
2 appreciate it's a, you know, it's a broad index  
3 of the market and railroads are very capital  
4 intensive and everything and S&P 500 isn't  
5 capital intensive, but it certainly seems that  
6 there are other elements of it that would make  
7 excellent sense.

8 DR. VILLADSEN: We have to remember  
9 here that what we really are trying to estimate  
10 is what is the inherent risk in the assets we are  
11 regulating or the assets we are trying to  
12 estimate our cost of capital for. So if I am  
13 looking at the S&P 500 I am seeing an awful lot  
14 of financial institutions who I would consider to  
15 be very, very different from the railroads. If  
16 you were to look at some other industries, you  
17 would try to look for some industries that were  
18 comparable to railroads in some sense. You would  
19 look for capital intensive industries, industries  
20 where high volatility in their revenues,  
21 industries that have similar features to the  
22 railroads. That would be what we would be

1 looking for, not for a broad --

2 MS. MILLER: Revenue, railroads have  
3 a high volatility in their revenues?

4 DR. VILLADSEN: They have had a high  
5 volatility.

6 MS. MILLER: Over what period of time?

7 DR. VILLADSEN: If you look back to  
8 the financial crisis.

9 MS. MILLER: Well, everybody had a  
10 high volatility during the financial crisis,  
11 didn't they? Well, I'm sure not everybody, but  
12 broadly across the market there was high  
13 volatility.

14 DR. VILLADSEN: And the number one  
15 thing, if you look at the catalyst pricing model,  
16 you will look to is also the volatility and the  
17 returns to investors. That of the railroad was  
18 quite a bit higher than the market in general,  
19 and it was extreme if you look at some of the  
20 financial institutions, and I don't think neither  
21 the ones who had no volatility, neither the  
22 financial institutions who saw volatility of

1 extreme amounts would be representative for the  
2 railroads. So if I were to do something  
3 differently, I would look for companies that for  
4 some are characteristically similar to the  
5 railroad, not for a broad cue of the S&P 500.

6 MS. MILLER: In WCTL's testimony, one  
7 of their areas of emphasis was that CAPM was  
8 broadly used by players in the market, not DCF  
9 models. You really didn't address that. Do you  
10 disagree with that? I mean, the impression given  
11 was that by and large, most, I don't know  
12 businesses, I guess, is what I should say, who  
13 utilize one of the models are going to go to the  
14 CAPM.

15 DR. VILLADSEN: I don't disagree that  
16 if you go and ask businesses what model do you  
17 estimate, they will say the capital asset pricing  
18 model, by far, the most frequently. I also work  
19 with a lot businesses, and what they do is they  
20 make adjustments to the capital asset pricing  
21 model, especially during the most recent period  
22 of time when they don't think it actually fits

1 what they call that hurdle weight, at which  
2 weight would they invest. If they come up with a  
3 number that's too low, they will subjectively  
4 adjust it to fit something they need. Another  
5 interesting point I want to make on that is that  
6 it is true that very few companies go out and  
7 estimate the discounted cash flow, or any version  
8 of that, to make specific investment decisions.  
9 However, if you look at a textbook, Ellsberg and  
10 Demasso, which is a fairly common financial  
11 textbook, they show you that, yes, most companies  
12 estimate the capital asset pricing model and then  
13 most companies look to other factors, whatever  
14 that might be.

15 MS. MILLER: So one of the other  
16 things WCTL suggested this morning in their  
17 testimony is that we might want to think about  
18 some benchmarking. What do you think about that?

19 DR. VILLADSEN: A lot of that would  
20 depend on exactly how you implement that. That  
21 is a case where it would all be in the details.  
22 So until we have a concrete proposal, and I don't

1 think the WCTL has brought one forward, I don't  
2 think I have specific comments on that. I am  
3 not, in principle, opposed to benchmarking, it  
4 depends on how we implement it.

5 MR. ATKINS: And Commissioner Miller,  
6 two additional points. One is when I mentioned  
7 the FCC report that went out and canvassed the  
8 literature, they came back and what they found  
9 was that, yes, CAPM is the most widely used model  
10 in the business community, but the multi-stage  
11 DCF model is the most widely used model by  
12 regulators, and they came to the conclusion that  
13 using a balance of the two of them is preferable  
14 to using either one.

15 MS. MILLER: Uh huh.

16 MR. ATKINS: And I think that a little  
17 bit of the reason is, the multi-stage, you can't,  
18 you couldn't just subjectively adjust the CAPM  
19 model if you thought it wasn't quite forward  
20 looking enough. You'd have to explain that  
21 subjective modification. But if you take a model  
22 that's got, based largely on historical

1 information like CAPM and weave in a multi-stage  
2 DCF model you're going to get a range and use an  
3 average of the two as being rather reasonable.

4 Second point I'd like to emphasize is, you know,  
5 I think it's a broader question of what standard  
6 should this board impose on Western Coal Traffic  
7 League or the AAR, or even its own staff in terms  
8 of when you're going to tinker with the approach  
9 that you currently use. Because the one lesson  
10 that everybody learned from those prior rule  
11 makings was that it's just a huge variety of  
12 models and a huge variety of input that can go  
13 into those models. So if we don't have a  
14 compelling standard and historically you've  
15 actually held all the parties to a high bar, you  
16 said show me compelling evidence that what we're  
17 doing is flawed. If you don't have that high bar  
18 then we're going to have two problems. We're  
19 going to be here every couple of years with this  
20 debate, which I don't think is in the board's  
21 interest, and it's not in our interest, plus also  
22 you interject into the community unnecessary

1       uncertainty, which I don't think is in the  
2       interest of the community.  Some stability in the  
3       estimate, I think, is appropriate.  Now, take as  
4       an illustration, if we lost UP, if UP became a  
5       private company and we could no longer perform  
6       our approach, we've lost the whole western side,  
7       that might be enough to trigger a need to  
8       reexamine, you know, do we have to change the  
9       model, but I know we lost DNSF, but it wasn't the  
10      majority of the industry and AAR feels that we  
11      can, you can continue to use the two approaches  
12      that you've got.

13                 MS. MILLER:  And then could you say a  
14      little more about, see, now I'm not going to get  
15      it right again, Vasicek?  Why you've recommended  
16      that.  I mean, you know, even with my butchering  
17      of the pronunciation, still, I got such a blank  
18      stare from the finance professor that it makes me  
19      wonder how common this adjustment is over the  
20      Blume adjustment.

21                 DR. VILLADSEN:  Vasicek, and I think  
22      that's the right pronunciation.

1 MS. MILLER: Vasicek, I'm sure you're  
2 saying it correctly.

3 DR. VILLADSEN: The reason that I  
4 think that's a better adjustment is that if it's  
5 based on a statistical analysis of what is the  
6 persistence in which you estimate your beta for  
7 the railroad industry for which you estimate  
8 position of any other beta you try to adjust to  
9 what. I like that approach, while instead of  
10 saying  $2/3$ ,  $1/3$ , that's based on data that was  
11 estimated from 1926 to 1960, and I'm not sure it  
12 still holds. In terms of how useful it is,  
13 there's not a whole lot of North American  
14 regulators who have used it. It's fairly commonly  
15 used in Europe. It's used by the Dutch  
16 regulator, it's used by the Italian regulator, it  
17 has, until recently, been used by the Spanish  
18 regulator, and unfortunately I was unable to read  
19 Spanish enough to figure out what the accurate  
20 number is.

21 MR. ATKINS: And another point to make  
22 about is my understanding of beta, and Dr.

1 Villadsen hopefully will interject if I'm wrong,  
2 is it all comes around concerns that your  
3 estimate of the beta isn't sufficiently accurate.  
4 So that there's uncertainty in your estimate of  
5 the beta and so they believe that if you're going  
6 to use, if you're going to estimate the beta and  
7 then you're actually going to use it to set rates  
8 for, like, the next five years going out, you  
9 might need to put in this adjustment to bring it  
10 down towards one because that's what you might  
11 think would happen. The more solid you are about  
12 your estimate of beta, the less you need to do  
13 some sort of arbitrary 1/3, 2/3 adjustment, but  
14 also importantly the more frequently you're  
15 calculating the beta, you're just going to  
16 instantaneously capture changes in beta over  
17 time. So you're not being asked to estimate beta  
18 today and then hold it constant for the next five  
19 years, which is what a lot of utility regulators  
20 do when they do their rate process. You're  
21 actually calculating beta every year, and it's  
22 not just for individual railroads. You calculate

1 this on a portfolio basis so you have more  
2 observations and your estimate is therefore more  
3 precise, and the Vasicek, and I'm almost exhaust  
4 my knowledge of it by saying it, is the reason  
5 it's a little more precise is it doesn't take  
6 this arbitrary 1/3, 2/3 number, it actually tries  
7 to determine how much precision is your beta  
8 estimate. What's your confidence interval? The  
9 more imprecise your beta estimate is, the more it  
10 will adjust it down towards one, but the tighter  
11 your estimate of beta actually is, the less,  
12 it'll leave it alone because the model is, we  
13 think its predicting the beta most accurately.  
14 So, end of the day, because you're using a  
15 portfolio and you're estimating beta every year,  
16 AAR submits there is no reason to be introducing  
17 this complexity, and I end on one last note.  
18 They site a lot of survey literature, and they  
19 say while the surveys show that everybody uses  
20 beta, a Blume adjustment, that's actually not  
21 what their survey showed. If you look at our  
22 reply of 28, we noted that the surveys say that

1 fifty percent of those who responded use  
2 unadjusted betas. So it's not like it's the  
3 predominant approach to use. You know, half use  
4 it, half don't. We think you're on solid ground  
5 sticking with the actual estimate of betas.

6 MS. MILLER: What about the  
7 recommendation to go to the fifty years, not back  
8 to 1926? Maybe I missed it, but I don't think in  
9 your testimony you mentioned that this morning.

10 DR. VILLADSEN: No, but I'm happy to  
11 address that. I believe you should use data as  
12 far back as you have reliable data. That's the  
13 best estimate. And the reason for that is that  
14 if you choose some period you are inherently  
15 going to have to make a decision on a cutoff.  
16 It's fifty years, it's forty years, it's sixty  
17 years. I would also like to point out that if  
18 you, for example, were to say okay, so the first  
19 period, the 20's and 30's were a little bit  
20 unreliable, as was World War II, and you go to,  
21 say 1947, which is right after World War II, and  
22 say let's use from 1947 till today, you would

1       come up with an estimate of 6.8 percent, very  
2       close to what we currently have. If you chose to  
3       go in a different direction, which is what a  
4       publication by credit twists or the Professor  
5       Stimson Martin Staunton do, they go back to 1900,  
6       you come up with an estimate that's 6.75 for the  
7       U.S. So you can extend it a little bit in either  
8       direction, and you are very close to what we  
9       currently have. So I would not recommend that  
10      you choose fifty years or some other. I would  
11      commend to choose some specific date where it  
12      says, well, I believe it's as far back as we have  
13      reliable data. I believe after World War II, but  
14      I think that's what the criteria should be based  
15      on. And there's also the simple thing that a  
16      friend of mine or colleague, Professor Myers used  
17      to say, well, history tends to repeat itself. So  
18      whatever historic information we have is useful.

19                   MS. MILLER: And then a final  
20      question. Is this a correct assumption on my  
21      part, I thought based on something that you said,  
22      that you've done some work before the Canadian

1 regulators?

2 DR. VILLADSEN: I've done quite a bit  
3 of work before the Canadian regulators. I have  
4 prepared reports for the Canadian transportation  
5 agency that was primarily a survey of what  
6 methods are used around the globe, and a  
7 description of what is the pros and cons of each  
8 of these methods. I've prepared testimony, also  
9 a report for the British Columbia Utilities  
10 Commission, which by the way decided to use fifty  
11 percent CAPM and fifty percent discounted cash  
12 flow in its decision, and, again, it was partly a  
13 description of what methodologies are being used  
14 and partly a description of what are pros and  
15 cons of the methodology. We did not, I did not,  
16 and my coworkers did not recommend this specific  
17 cost of equity in those reports.

18 MS. MILLER: One of the things I'm  
19 wondering, and maybe there isn't an analog in the  
20 way the Canadians regulate railroads, but on this  
21 issue of for revenue adequacy, whether or not  
22 we're using actual revenues, what the heck is the

1 term that we've been debating back and forth?  
2 Replacement costs. Replacement costs, is there  
3 an analog in the Canadian approach?

4 DR. VILLADSEN: The Canadian regulator  
5 does not use replacement costs. I don't think I  
6 can speak to whether they do anything of analog,  
7 I have not studied that issue, so I'm afraid I'll  
8 say something that's inaccurate.

9 MS. MILLER: Okay, thank you.

10 MR. ELLIOTT: That's it, thank you  
11 very much. Okay, we're going to take a half hour  
12 break, so we'll be back here around 12:40 for  
13 lunch. Thank you.

14 OFF THE RECORD

15 ON THE RECORD

16 MR. ELLIOTT: All right, why don't we  
17 continue with the third panel. You may begin.

18 MR. MORENO: Good morning. On behalf  
19 of the Concerned Shipper Associations comprised  
20 of the American Chemistry Counsel, the Fertilizer  
21 Institute, the Chlorine Institute, and the  
22 National Industrial Transportation League I want

1 to first thank the board for initiating this  
2 proceeding and scheduling this hearing. As has  
3 been the case without written comments in this  
4 proceeding, our testimony today will focus upon  
5 the revenue adequacy questions and docket Ex  
6 Parte 722. Over the course of our testimony, we  
7 will address the following questions from the  
8 board's hearing notice: What is the appropriate  
9 time period for measuring revenue adequacy, and  
10 what is an appropriate definition for a business  
11 cycle? Should the board require a revenue  
12 adequate railroad to justify rate increases for  
13 complaining shippers, and would this be  
14 consistent with the statute in a relevant law?  
15 Should a revenue adequate railroad's ability to  
16 differentially price be limited for all catted  
17 shippers or for a subset most likely to be  
18 subject to railroad market power, and is there a  
19 way to identify those shippers, most likely to be  
20 subject to market powers such as RSAM, RBC's, or  
21 the maximum markup methodology? Finally, we will  
22 discuss the impact of our revenue adequacy

1 proposals on the railroads in light of recent  
2 service issues facing the rail industry.

3 As we have watched the rail industry  
4 achieve or come close to achieving revenue  
5 adequacy through its unprecedented financial  
6 success, it is clear that the revenue adequacy  
7 goals of the Staggers Act have been, or very soon  
8 will be met. As the ICC recognized and coal rate  
9 guidelines, the achievement of revenue adequacy  
10 opens the door for alternative methods for  
11 determining whether the rates charged to carted  
12 shippers are reasonable because, "carted shippers  
13 should not be required to continue to pay  
14 differentially higher rates than other shippers  
15 when some or all of that differential is no  
16 longer necessary to ensure a financially sound  
17 carrier capable of meeting its current and future  
18 service needs." The revenue adequacy constraint,  
19 thus, is a long awaited and economically  
20 supportable and judicially supported alternative  
21 to standalone costs, or SAC. As demonstrated at  
22 the end of yesterday's testimony, SAC has proven

1 to be too costly, too complex, and too lengthy to  
2 be a practical use to all but a handful of cafted  
3 shippers. The entire constrained market pricing  
4 construct designed by the ICC and coal rate  
5 guidelines was to determine the proper level of  
6 differential pricing. None of the four rate  
7 constraints and guidelines including revenue  
8 adequacy is predicated upon rate of return or  
9 earning type regulation. The assertions to the  
10 contrary in yesterday's railroad testimony are  
11 simply an exercise in misdirection.

12 Specifically, coal rate guidelines states that  
13 the constraints in CMP represent different means  
14 of approaching the same basic issue, i.e., the  
15 extent of unattributable costs to be covered  
16 through differential pricing and the portion that  
17 can be charged to the shipper involved.

18 Moreover, each constraint was designed  
19 to approach this question from a different  
20 perspective. The ICC, again, specifically stated  
21 that our guidelines offer the flexibility to  
22 approach the rate analysis from various

1 perspectives. Number one, appropriate level and  
2 minimum cost of efficient service to cafted  
3 shippers in the SAC analysis. Number two, the  
4 appropriate level of carrier revenue needs in the  
5 revenue adequacy examination, three, other  
6 available means of meeting or eliminating those  
7 revenue needs through the scrutiny of the  
8 carrier's efficiency, as in the management  
9 efficiency constraint, and finally, the phasing  
10 constraint, which was the public interest in  
11 minimizing economic destructions. Although SAC  
12 and revenue adequacy are both constraints upon  
13 differential pricing, they were never intended to  
14 operate the same way or to produce the same  
15 results. Indeed, in guidelines, the ICC stated  
16 that the various constraints contained in CMP may  
17 be used individually or in combination to analyze  
18 whether the rated issue is unreasonably high.

19 The overarching objective of the  
20 concerned shippers in this proceeding has been to  
21 provide the board with concrete proposals for  
22 implementing the revenue adequacy constraint.

1 Our guidelines for developing proposals that we  
2 will present today have been to make them  
3 practical, cost effective, economically  
4 supportable, and within the existing statutory  
5 parameters. Consistent with guidelines, our  
6 focus throughout has been on regulating the level  
7 of differential pricing, not rate of return or  
8 earnings regulations. Through specific examples  
9 today, we will illustrate how our proposals could  
10 work and prove that they do not constitute rate  
11 of return regulation. Specifically, we will show  
12 that the parade of horrors caused by  
13 yesterday's railroad economic witnesses cannot  
14 come to pass because our proposals protect  
15 competitive traffics contribution to revenue  
16 adequacy, and do not impose an upper limit on  
17 railroad earnings. Our testimony will cover four  
18 principle subjects. The critical role of revenue  
19 adequacy and implementing Ramsey Pricing  
20 Principles in the coal rate guidelines. The  
21 proper time period for measuring revenue  
22 adequacy, methods by which the board could

1 implement the revenue adequacy constraint, and  
2 the impact of those proposals upon rail service  
3 and investment.

4           Although our focus is on Ex Parte 722,  
5 that should not be construed as disinterest on  
6 our part in Ex Parte 664. We are very much  
7 interested in that proceeding because how the  
8 board measures revenue and adequacy is a  
9 predicate to determining the applicability of  
10 whatever methodologies the board eventually  
11 adopts for implementing the revenue adequacy  
12 constraint. We had deferred the Western Coal  
13 Traffic League to argue the issues in Ex Parte  
14 664 so that we can devote our resources to  
15 developing proposals for properly implementing  
16 the revenue adequacy constraint upon rail pricing  
17 of catted traffic. We nevertheless desire to  
18 express our support for the WCTL petition and the  
19 positions that they have advocated in this  
20 proceeding, which demonstrate that if anything  
21 the board's existing measure of revenue adequacy  
22 has established a conservatively high bar.

1           The Concerned Shipper Associations are  
2 represented today by the five witnesses at this  
3 table. Together with Paul Donovan, I am counsel  
4 to the Concerned Shipper Associations, and we are  
5 here to address the legal questions. We are  
6 accompanied by three economic witnesses. To my  
7 left is Dr. Kevin Caves who will address the role  
8 of revenue adequacy in developing more efficient  
9 rail pricing, conceptual approaches for applying  
10 the revenue adequacy constraint, and the impact  
11 of those approaches upon rail investment. To my  
12 right is Thomas Crowley, who will provide a  
13 practical illustration of how to determine if a  
14 rail carrier is revenue adequate for purposes of  
15 applying a revenue adequacy constraint. Mr.  
16 Crowley also will provide practical illustrations  
17 of how to apply the conceptual approaches  
18 described by Dr. Caves. To my far right is Jay  
19 Roman, who will review key financial metrics for  
20 the rail industry, to demonstrate why adoption of  
21 a revenue adequacy constraint is unlikely to have  
22 any impact upon rail service or investment.

1 Because each witness covers multiple interrelated  
2 topics, our presentation format today will be a  
3 little different from your typical testimony.  
4 Instead of going down the table with each witness  
5 speaking one at a time, we will have a moderated  
6 format that rotates among the witnesses according  
7 to the topics at hand. Mr. Donovan and Mr. Roman  
8 together will begin this testimony by addressing  
9 why revenue adequacy constraint will not impact  
10 rail service or investment.

11 MR. DONOVAN: Thank you. I would like  
12 to invite the board's attention to page three of  
13 its order in this proceeding, and I'll just quote  
14 that to you. It's very brief. "Some comments  
15 argue that any proposal that would limit the  
16 railroad's return on investment would negatively  
17 impact the railroad's ability to invest in their  
18 networks and expand capacity. Please discuss the  
19 impact of your revenue adequacy proposals on the  
20 railroads. Again, in light of the recent service  
21 issues faced by the industry." I'm going to ask  
22 Mr. Roman to present information to you that will

1 demonstrate, I think to your satisfaction, that  
2 the railroad industry is not facing service  
3 problems. The railroad industry is creating  
4 service problems. With that, Jay?

5 MR. ROMAN: Okay, thanks Paul. My name  
6 is Jay Roman. Pleasure to be with you this  
7 afternoon. As Mr. Donovan said, I am going to be  
8 going over both the operational and commercial  
9 results of the four major class I railroads.  
10 We're going to do this for the last ten years,  
11 starting in 2005 and ending in 2014. And  
12 whenever you're looking at the railroads, one of  
13 the first things you want to do is start out with  
14 car loads. The illustration on the screen has  
15 annual car loads each year between 2005 and 2014.  
16 When you say that the car loads varied quite a  
17 bit over this time frame, but they ended up  
18 pretty much where they began. In the year of  
19 2005 we were looking at 34.7 million car loads on  
20 the four major class I railroads. The only year  
21 where we exceeded that number of car loads was  
22 2006. After 2006, car loads plummeted. With the

1 recessionary years of 2008 and 2009, they hit a  
2 low point, and then after 2009, car loads were  
3 increasing each year. But in 2014, we still have  
4 34.5 million car loads, which is virtually, you  
5 know, almost the same as it was in 2005. So when  
6 you're looking at the car load information, based  
7 upon all the money that the railroads are saying  
8 they're putting into the system, you would expect  
9 that service has really improved because the car  
10 loads are the same in 2014 as they are in 2005.  
11 If lots of money is invested in the system, you  
12 would expect service to be a lot better, but  
13 unfortunately that's not the case.

14           The service metrics that we're looking  
15 at, first off, we're looking at dwell time.  
16 Between 2005 and 2014, dwell time is the amount  
17 of time it takes a car to get out of the yard,  
18 and dwell time increased by 6.1 percent. Okay,  
19 that is not a positive for service. Train speed,  
20 between 2005 and '14 increased slightly, and  
21 chairs has increased slightly here. Am I falling  
22 down?

1 MS. MILLER: That's one of our trick  
2 chairs.

3 MR. ROMAN: Maybe I have this. Okay,  
4 train speed has increased slightly over this time  
5 frame, but it's not too different from what it  
6 was in 2005. Total car loads, which you just  
7 looked at on the previous illustration, is down.  
8 So when we're looking at operation results of the  
9 railroads, they haven't really improved over the  
10 last 10 years. Now, what this is demonstrating  
11 is that shippers are frequently complaining about  
12 what is happening with their service and these  
13 metrics give you an example of why. Based upon  
14 the rate increases the railroads have had over  
15 this time, service really hasn't improved, and  
16 you're faced with a dichotomy at the board. You  
17 have the railroads coming in and they're saying  
18 we're investing all this money in our system, and  
19 you have the shippers which are saying, gee,  
20 we're not really receiving the benefits of that.  
21 We don't see our service improving, and some  
22 shippers are complaining that their service is

1 going down. So to try to get to the bottom of  
2 why this dichotomy exists between what the  
3 railroads are saying and what the shippers say  
4 they're actually getting from the railroads, we  
5 looked at what has happened to the change in the  
6 railroad's operating profits. We wanted to see  
7 where those operating profits were going to, and  
8 for that we looked at the primary destination for  
9 operating profits, which was capital expenditures  
10 and payout to stockholders. And first off, we're  
11 looking at the year of 2005. Payout to  
12 stockholders includes three things. It includes  
13 dividends, it includes stock repurchases, and  
14 when we get to 2010 and thereafter it includes  
15 the BN's disbursement to the parent company.  
16 So if we look at 2005 we see that payout to stock  
17 holders was 1.67 billion dollars. Capital  
18 expenditures were a little over six billion  
19 dollars. It's kind of a twenty-two percent  
20 versus seventy-eight percent split between payout  
21 to stockholders and capital expenditures. When  
22 we then look at the second pie on the chart on

1 the right, that is for the year of 2014, and we  
2 have a very different picture. And one of the  
3 reasons we have a different picture is the  
4 railroads made a lot of additional profit.

5 Between 2005 and 2014 railroads operating revenue  
6 increased about sixty-four percent, while their  
7 operating expenses increased about 38 percent.

8 We're dealing with a twenty-six percent

9 difference. So even though the car loads the

10 railroads moved were pretty much the same in 2005

11 versus '14, twenty-six percent additional revenue

12 generates a lot of additional profit. And there

13 was a lot more that was spent by the railroads on

14 both capital expenditures and payout to

15 stockholders. The pie for payout to stockholders

16 increases dramatically more in 2014 from where it

17 was in 2005. And the reason for that is there

18 was about a five hundred thirty percent increase

19 in payout to stockholders over this time frame.

20 So it caused payout to stockholders to represent

21 a much larger portion of the pie between capital

22 expenditures and what went to the stockholders.

1 Now, capital expenditures also increased over  
2 this time. They went from six billion dollars in  
3 2005 to a little over fourteen billion dollars in  
4 2014. But what this is demonstrating is that the  
5 money that has been going to the stockholders is  
6 actually increasing dollar values more than  
7 capital expenditures. The increase in payout to  
8 stockholders was about 8.8 billion dollars here  
9 where capital expenditures were just about at  
10 eight billion dollars. Well, this is just  
11 looking at one slice of time between 2005 and  
12 2014. So we also looked at this over a longer  
13 time period. And this illustration is showing  
14 what happened to payout to stockholders versus  
15 capital expenditures over the time period of 2005  
16 to 2009 in the left pie, and then the more recent  
17 time frame is what happened in the 2010 to 2014  
18 time frame. Now what you find in 2005 to 2009  
19 there were 61-1/2 billion dollars that went to  
20 one of these two categories, and there was about  
21 payout to stockholders was about thirty-five  
22 percent of the pie during this time frame, and

1 the capital expenditures were about sixty-five  
2 percent. When we go out to the more current time  
3 frame, 2010 to 2014, our pie looks very  
4 different, and we're getting pretty close to a  
5 50/50 split. And the reason for that is there  
6 was much more money that was put into both of  
7 these categories, 103.9 billion dollars, but in  
8 the payout to stockholders it increased by 25.5  
9 billion dollars while capital expenditures  
10 increased by 16.9 billion dollars. So what this  
11 information is demonstrating is that stockholders  
12 made out very well from the increase in rail  
13 profits. And I'll demonstrate that on the next  
14 illustration.

15 This bar chart is showing, the second  
16 bar down is showing the increase in operating  
17 profit between 2005 and 2014. Operating profit  
18 increased one hundred seventy-three percent.  
19 Well, with this increase in profit, railroads  
20 were able to give a five hundred thirty percent  
21 increase in payout to stockholders. Both of  
22 these things cause a dramatic increase in the

1 value of railroad stock, and the four publicly  
2 traded railroads UP, NS, and CSX, the average  
3 price of their stock between 2005 and 2014  
4 increased about three hundred forty-five percent.

5 Now, in my written testimony I have a number in  
6 there that the railroad stock price only  
7 increased one hundred sixty-eight percent, and  
8 that's because I made an error. But the reason  
9 for the error is pretty important. Because of  
10 the big increase in railroad profits, their stock  
11 price was soaring. It was going up rapidly, and  
12 there were a number of different stock splits  
13 that the railroads initiated. In my earlier  
14 number, I didn't catch all of the stock splits of  
15 the railroad. When you consider all the times  
16 that the railroad stock split over the time  
17 frame, the increase was three hundred forty-five  
18 percent in the value of their stock. So  
19 shareholders have obviously benefitted greatly  
20 from increased rail profit. The rest of the  
21 measures on this bar chart have to do with  
22 railroad operations. The next two bars down,

1 miles of earned track and revenue ton miles were  
2 owned by all of the track. These are a little  
3 bit different than other things we're looking at.  
4 These are AAR numbers. These are not numbers for  
5 just the four major railroads, the Association of  
6 American Railroads only puts this data out for  
7 all the class I railroads, and we didn't have  
8 this data available for 2014, so these present  
9 changes stop in 2013, but they're pretty  
10 instructive.

11           When we looked at miles of owned  
12 track, between 2005 and 2013 time frame, it was  
13 down 1.4 percent. So there's less track that the  
14 railroads own. When we look at the revenue ton  
15 miles, it shows that there's greater congestion  
16 because there's more revenue ton miles going  
17 across the track they own because that's  
18 increased 4.1 percent. The other bars on this  
19 chart are things that I've already discussed.  
20 Average dwell time is increased 6.2 percent,  
21 which means the cars are staying in yards longer.  
22 Average train speed was pretty similar in 2015 to

1 what it was, excuse me, 2014 to what it was in  
2 2005, and car loads were pretty much the same.  
3 What this is demonstrating, that the increase in  
4 rail profit has not improved operations for  
5 shippers. Now, when we look at this data it  
6 needs to be considered that there are two  
7 different types of capital expenditures that the  
8 railroads make. One type of capital expenditure  
9 is to maintain the existing infrastructure of the  
10 system. There is a different type of capital  
11 expenditure that can be made, which is to improve  
12 capacity of the system. What these numbers  
13 demonstrate is that the capital expenditures the  
14 railroads are making are more for capital  
15 expenditures to maintain the existing  
16 infrastructure of the system. Because service  
17 hadn't improved over this time frame, even though  
18 the number of car loads that the railroads move  
19 is virtually the same in both 2005 and 2014.

20 Now, I'd like to conclude my testimony  
21 here with just saying that the purpose of doing  
22 this analysis was trying to explain the dichotomy

1 between what you're hearing from railroads versus  
2 what you're hearing from shippers. And what the  
3 results of the analysis show is that rate  
4 increases are not necessarily the answer to  
5 getting better service. And what the analysis  
6 shows is that in order for you to properly  
7 control service, it will be very difficult  
8 without being able to institute some type of  
9 control over how much of the increase in the  
10 railroads profit caused by rate increases are put  
11 back into the rail system. And that concludes my  
12 testimony.

13 MR. DONOVAN: Thank you. Dr. Caves  
14 will now address the role of revenue adequacy in  
15 Ramsey pricing, and explain why revenue adequacy  
16 constraint provides a more efficient pricing  
17 structure than standalone costs for regulating  
18 rail rates.

19 DR. CAVES: Thank you and good  
20 afternoon to everybody. I'll first start off by  
21 talking about standalone costs. The standalone  
22 cost is the hypothetical cost to a railroad,

1 providing service to only a subset of its full  
2 network. By definition, a standalone cost  
3 provider is less efficient than the incumbent  
4 provider because it has fewer efficiencies  
5 available to it in terms of scale and scope  
6 economies. The first problem with trying to  
7 apply a standalone cost regulation to the rail  
8 industry is that its actually designed to solve a  
9 problem that doesn't exist in the rail industry  
10 in the first place. In particular, and this  
11 slide is for later, actually. In particular, the  
12 standalone cost framework was developed for use  
13 in a fully regulated monopoly, in which  
14 regulators set all the prices that the fully  
15 regulated monopoly is allowed to charge. Under  
16 these specialized conditions, standalone costs  
17 will prevent cross-subsidization among different  
18 groups of customers. That is the purpose for  
19 which the standalone cost test was designed. Of  
20 course, that simply doesn't apply here. The  
21 majority of rates, as we all know, are fully  
22 deregulated. You don't have to take my word for

1 it. The original author of the SAC test, Jerry  
2 Faulhaber, has already submitted a verified  
3 statement in which he has debunked the railroad's  
4 claims that the standalone cost test is well  
5 designed for the rail industry. But just to  
6 reiterate, because I've heard these claims  
7 repeated by the railroads yesterday, I'll just  
8 read a few key passages from Professor  
9 Faulhaber's verified statement.

10 He begins on page one by repeating  
11 some of the rather grandiose claims that have  
12 been made about the standalone cost test by the  
13 railroads, such as the standalone cost tests rest  
14 on a sound economic foundation, the standalone  
15 cost test is the most accurate procedure for  
16 determining rail rates, the standalone cost test  
17 is widely and consistently recognized by  
18 economists as the gold standard, etc., etc.

19 Professor Faulhaber's response to this is, "As  
20 the original author of standalone costs, I would  
21 be quite flattered by all of this if any of it  
22 were true." And he goes on to explain why it's

1 not and why it's not accurate. He also goes on  
2 to explain that the standalone cost framework  
3 "simply does not fit the STB regulated firms. It  
4 is not even close. This provides no economic  
5 justification for imposing standalone cost  
6 regulation. None." That's the first problem  
7 with applying standalone cost regulation. The  
8 second problem with applying it to the rail  
9 industry is that it's not designed to prevent  
10 prices to captive shippers from rising above  
11 competitive levels. There is nothing in the SAC  
12 standard that will prevent prices to captive  
13 shippers from rising well above competitive  
14 levels right up to the fully monopolistic pricing  
15 level.

16 The SAC standard, in fact, focuses the  
17 regular on the inefficiently high cost of the  
18 hypothetical network, and inappropriately rewards  
19 railroads for their incumbent position by linking  
20 their prices to those of a less efficient  
21 hypothetical rival. So now I'd like to talk  
22 about the alternative, which is, of course, a

1 revenue adequacy standard. The first thing to  
2 clarify about revenue adequacy is that under this  
3 standard, by definition, the railroads would  
4 always be able to cover all of their costs, all  
5 their fixed costs, all their variable costs, and  
6 all of their costs of attracting capital. By  
7 definition that would be true. And this may well  
8 require, this will, in fact, tend to require that  
9 the railroad exercise some degree of market power  
10 with respect to its captive shippers. However,  
11 after revenue adequacy is achieved, the railroad  
12 should also face some constraint on the exercise  
13 of market power with respect to its captive  
14 shippers. Why is this? Well, it's just basic  
15 economics. Unconstrained monopoly pricing causes  
16 economic efficiency or dead weight loss, and you  
17 will find this in any Econ 101 textbook, I can  
18 guarantee you.

19 This brings us to Ramsey Pricing Principles,  
20 which are very closely related to revenue  
21 adequacy. According to Ramsey Pricing  
22 Principles, the objective of an economically

1 efficient pricing structure should be to minimize  
2 the deadweight loss of monopoly pricing subject  
3 to the constraint that the railroad must earn  
4 sufficient returns to cover all of its costs,  
5 including the cost of attracting sufficient  
6 capital. In other words, the Ramsey Pricing  
7 Framework is an exercise in constrained  
8 optimization, and revenue adequacy defines the  
9 constraint to the Ramsey problem. And I'll try  
10 to go over this in a little more detail and  
11 illustrate it in the next slide. Sorry, the  
12 previous slide. Yes. So, the idea motivating  
13 Ramsey Pricing is very simple. Economic  
14 efficiency, according to the very basic  
15 principles in economics, is promoted all else  
16 equal, by setting price equal to marginal costs.  
17 However, when you have an industry with economies  
18 of scale and high fixed cost as you do in the  
19 railroad industry, marginal costs will tend to  
20 lie below average costs, and that means strict  
21 marginal cost pricing is not feasible. Any  
22 entity that attempted to set all its prices equal

1 to those marginal costs would go out of business.

2 So how do you solve this dilemma?

3 Well, there's the profit maximizing solution,  
4 which is simple. You set prices high as possible  
5 above marginal costs, and just charge whatever  
6 the market will bear. The problem with this is  
7 what we've already mentioned earlier. If you  
8 have a monopoly exercising market power you're  
9 going to get monopoly pricing and you're going to  
10 get dead weight lost, and that's economically  
11 inefficient. So Ramsey Pricing Principles  
12 provide a better, more efficient solution to the  
13 problem, and it's a very intuitive solution. The  
14 idea is, yes, go ahead and set price above  
15 marginal costs, that has to be true, but only by  
16 enough to cover all of the costs, all of the  
17 fixed costs, all the variable costs, all the  
18 necessary investment returns. So, again, it's an  
19 exercising constrained optimization in which the  
20 idea is to move price as close to marginal cost  
21 as possible without violating the revenue  
22 adequacy constraint. However, as long as that

1 constraint is satisfied, as long as the railroad  
2 is earning sufficient returns, any rate  
3 adjustment closing the gap between price and  
4 marginal cost is economically efficient. That's  
5 what Ramsey Pricing tells us. Any adjustment.  
6 Even if the full Ramsey optimum is never  
7 achieved.

8 So suppose we have a shipment and the exact  
9 Ramsey price is a hundred dollars, and we have a  
10 monopolistic railroad that's charging a thousand  
11 dollars. If we move that rate from a thousand to  
12 five hundred that would still involve a very  
13 substantial improvement in economic efficiency,  
14 even if we never get it down to one hundred. So  
15 in conclusion, Ramsey Pricing Principles imply a  
16 substantial scope for efficiency improvement in  
17 railroad rate structures with respect to captive  
18 shippers, and these improvements can be realized  
19 by lowering prices below the levels implied by  
20 SAC and closer to the Ramsey levels, even if the  
21 exact Ramsey price is never actually reached.

22 MR. MORENO: This brings us to the

1 question of how do you actually implement the  
2 revenue adequacy constraint in practice. Dr.  
3 Caves, Mr. Crowley, and I have given extensive  
4 consideration to how the board might apply the  
5 revenue adequacy constraint in a manner that is  
6 practical, cost effective, economically  
7 supportable, and consistent with the statute.  
8 The first step in developing any methodology for  
9 implementing the revenue adequacy constraint is  
10 to identify the proper time period for assessing  
11 the revenue adequacy of a rail carrier, which is  
12 a question that the board has posed in its  
13 hearing notice. Dr. Caves will address this  
14 predicate question, and he will be followed by  
15 Mr. Crowley, who will illustrate how to determine  
16 the extent to which a railroad is revenue  
17 adequate consistent with Dr. Caves' testimony.

18 DR. CAVES: Thank you. The ICC has  
19 previously suggested measuring revenue adequacy  
20 over the course of a business cycle, and that is,  
21 in fact, an economically valid and supportable  
22 approach, essentially because it adopts a

1 reasonable investor perspective. Investors care  
2 about future returns and they face the problem of  
3 trying to gauge future performance based on past  
4 performance. Of course, the economy is  
5 procyclical, it goes through business cycles, it  
6 goes through ups and downs. So the railroads  
7 profits at the peak of the business cycle are  
8 going to tend to over predict its future returns,  
9 and their profits at the trough of the business  
10 cycle will tend to under predict future returns,  
11 obviously. So you don't want to pick one single  
12 year if you're an investor trying to figure out  
13 whether to invest in the railroad, so if we just  
14 take the average performance over the course of  
15 the business cycle, that will give a better, more  
16 reasonable estimate of expected future returns.  
17 Over the post war period, if you looked at the  
18 NBR website, the NBR is the official body that  
19 dates business cycles. The average business  
20 cycle has lasted for about sixty-nine months, so  
21 about six years. So this is a reasonable time  
22 frame for measuring revenue adequacy. Notably,

1 the most recent US business cycle includes the  
2 great recession of 2007 through 2009. This is  
3 universally recognized among economists as the  
4 most severe economic down turn in the post war  
5 period. In other words, the most severe  
6 recession we've had since the Great Depression.  
7 It's been more severe in terms of duration and in  
8 terms of losses in employment and in output. I  
9 bring this up because the railroad's robust  
10 financial performance during and since the great  
11 recession can and should be seen as powerful  
12 evidence of the long-term financial viability and  
13 of their ability to compete with other industries  
14 for capital in the equity markets.

15 In fact, if we were to just look at  
16 the railroad's returns since the end of the  
17 recession, we would find that railroad stocks  
18 have gone up since mid-2009 by about two hundred  
19 thirty-nine percent. The Dow Jones Industrial  
20 Average has gone up by less than half that  
21 amount, one hundred ten percent. The S&P has  
22 gone up by one hundred twenty-five percent.

1       Trucking stocks have only gone up by seventy-six  
2       percent.  Yet, according to the railroads, they  
3       can't even earn enough to cover their cost of  
4       capital and they're a bad investment.  So by that  
5       logic, I think they would advise you not to buy  
6       their stock in 2009.  I think you should have  
7       bought it personally.  And the other point we'll  
8       get into later is if the railroads are not, in  
9       fact, earning enough to cover their cost of  
10      capital, how, in fact, have they made the  
11      investments that they've rightly been proud of  
12      and have been reporting to you?  For example,  
13      since the end of the great recession, they have  
14      invested one hundred sixty-eight billion.  In the  
15      past ten years they've invested two hundred  
16      forty-four billion, and in the past twenty years,  
17      since 1995, they've invested three hundred  
18      ninety-four billion.

19               Now, over the vast majority of this  
20      time period, by the board's own metrics, they  
21      were revenue inadequate.  And what that tells us  
22      is that that revenue adequacy measures that we're

1 using are a very conservative measure that  
2 understates the railroad's true ability to  
3 attract capital, and I think it's important to  
4 keep that in mind.

5 MR. CROWLEY: Using actual UP data as  
6 the example, plus the six year business cycle  
7 that Dr. Caves was talking about, I demonstrate  
8 in this analysis how to measure the shortfalls  
9 and surpluses related to revenue adequacy on a  
10 year by year basis. Column one identifies each  
11 of the years in the analysis. Column two  
12 identifies the STB's determination of the  
13 railroad industry cost of capital for each of the  
14 six years in the business cycle. Problem three  
15 shows the UP's tax adjusted revenue shortfalls  
16 and surpluses by year over the same six years as  
17 determined by the STB in its calculation of UP's  
18 revenue shortfall allocation method, or RSAM  
19 ratios. Specifically, column three shows that UP  
20 has generated tax adjusted surplus every year  
21 except for 2009 when the country experienced the  
22 largest economic down turn in the post-World War

1 II period. Column four calculates the value of  
2 each year's surplus or shortfall in 2014 dollars,  
3 using the railroad cost of capital appearing in  
4 column two to calculate each value. Line seven,  
5 column four shows the sum of the surpluses and  
6 shortfalls over the six-year business cycle, and  
7 line eight, column four shows the average surplus  
8 which was used in later slides.

9 MR. MORENO: So once a rail carrier is  
10 determined to be revenue adequate, as this  
11 example demonstrates for Union Pacific over the  
12 most recent six year period available, based on  
13 the board's revenue adequacy determinations. The  
14 revenue adequacy constraint can then be applied  
15 to determine the reasonableness of the challenged  
16 rate. Dr. Caves has identified two potential  
17 approaches for implementing the revenue adequacy  
18 constraint, which he calls the yardstick approach  
19 and the rebate approach. Dr. Caves will first  
20 discuss the conceptual underpinnings and  
21 practical application of the yardstick approach,  
22 and then we'll turn to the rebate approach after

1 that.

2 DR. CAVES: Thank you. So, the all  
3 right, we'll stay there for now. So the  
4 yardstick approach, the basic idea is to use  
5 statistical methods to predict the rates that  
6 captive shippers would pay under more competitive  
7 conditions, so in essence, you take a sample of  
8 comparable competitive rates and you compare it  
9 to what shippers are paying and see if there is a  
10 significant difference. This appeared to be what  
11 some of the railroad's own economists were  
12 endorsing during their testimony yesterday.  
13 Specifically, I think it was Professor Kalt. In  
14 any case, the idea would be to, when you're  
15 drawing this sample of competitive shipments to  
16 obtain the rates of the competitive shipments,  
17 and then to obtain relevant characteristics of  
18 these competitive shipments, such as the  
19 commodity type, the distance of the shipment, the  
20 size of the shipment, cost variables from ERC's,  
21 perhaps, that influence the cost of making the  
22 shipment and so forth. Once we have this

1 variable we can build a model that quantifies the  
2 relationship between the characteristics of the  
3 shipment on the one hand and the actual rates  
4 paid on the other. Once the model has been  
5 developed, shippers in captive markets could, in  
6 effect, take the characteristics of their  
7 shipments, plug them into their model, and see  
8 what the comparable competitive rate is for their  
9 shipments, perhaps through an interactive  
10 website. If the shipper's actual rates  
11 sufficiently exceeds the predictive competitive  
12 rate, then the shipper would have a basis for  
13 relief. Of course, if the shippers were already  
14 paying something close to the predicted  
15 competitive rate, close to the predictive  
16 competitive rate, then they would have no basis.  
17 The TRB has already endorsed this approach and  
18 constructed a prototype model that does exactly  
19 this, and you can read about in their full  
20 report. They use the Carload Waybill sample to  
21 do so.  
22 I will give a highly simplified example in what

1 follows that sort of follows the broad contours  
2 of the TRB while hopefully giving a more  
3 intuitive explanation of how the benchmark  
4 approach would work. And when I say benchmark,  
5 we're going to use benchmark and yardstick  
6 interchangeably here. Okay. So here we have a  
7 very, very simplified version of what the model  
8 would look like for illustrative purposes. On  
9 the horizontal axis we have the distance of the  
10 shipment measured in miles. On the vertical axis  
11 we have the rate of the shipment measured in  
12 cents for ton mile, and you can see we have a  
13 scattering of blue diamonds that represent a  
14 sample of competitive rates. So this would be  
15 the blue diamonds are a benchmark sample. And  
16 according to this simple model, the actual rate  
17 is a linear function of the distance of the  
18 shipment. You can see there's a straight line  
19 going through the blue dots. In particular, the  
20 slope of the line is negative because we would  
21 expect that for longer distances shippers would  
22 tend to pay lower rates per ton mile, and in

1 fact, that's what the TRB itself has found in its  
2 own work. So once you have the sample and once  
3 you've estimated the model, in this case, just a  
4 straight line, the potentially captive shippers  
5 can compare their rates.

6 So I have three hypothetical  
7 potentially captive shippers here, shipper A,  
8 shipper B, and shipper C all paying potentially  
9 anticompetitive rates. So let's perform the  
10 comparison first for shipper A. You can see that  
11 here. Shipper A would first, well, obviously it  
12 would know its actual rate. We could just read  
13 over to the vertical axis, 14 cents per ton mile,  
14 and that's being shipped over a distance, if you  
15 read it down to the horizontal axis over roughly  
16 700 miles, and according to the benchmark model,  
17 comparable shippers shipping over a distance of  
18 seven hundred miles are paying a competitive rate  
19 of approximately seven cents per ton mile. So,  
20 shipper A appears to be paying about twice as  
21 much as what comparable competitive shippers are  
22 paying.

1                   Same exercise I'll go through for  
2 shipper B. Shipper B is shipping over a longer  
3 distance, about a thousand miles. Its actual  
4 rate is ten cents per ton mile, and comparable  
5 competitive shippers are paying about six cents  
6 per ton mile for shipping over the same distance.  
7 And once again, for shipper C it's the same  
8 exercise, nine cents per ton mile being the  
9 actual rate, and four cents per ton mile being  
10 the competitive benchmark rate. The other thing  
11 to note about shipper C is you can see clearly in  
12 the model that there are competitive benchmark  
13 shipments that are paying rates higher than what  
14 C is paying, right? So if you look over to the  
15 left-hand side those two blue diamonds there are  
16 both above the red dotted line. So those are  
17 competitive shippers who are paying more than ten  
18 cents per ton mile, where shipper C is paying  
19 over nine cents per ton mile. But, of course,  
20 they're shipping over a much shorter distance, so  
21 you would expect them to be paying a higher rate.  
22                   So now that we've done this comparison

1 for shippers A, B, and, C we can compute a very  
2 simple statistic, which is simply for each  
3 shipper the ratio of the rate it actually pays to  
4 the rate its predicted to pay under more  
5 competitive conditions. So, for shipper A  
6 recalled that they were paying fourteen cents per  
7 ton mile. The predicted competitive rate was  
8 seven cents per ton mile. You divide one by the  
9 other and you get a ratio of two. So they're  
10 paying twice as much as what the competitive  
11 benchmark says. Shipper B, on the other hand, is  
12 only paying 1.67 times as much as the competitive  
13 benchmark. Shipper C is paying 2.25 times as  
14 much, so this ratio is useful because it tells us  
15 which shippers are facing the steepest over  
16 charges relative to the competitive benchmark.  
17 The next step in this method is to select an  
18 allowable differential, a maximum value for R  
19 that we're going to allow. And this can be  
20 calibrated to protect revenue adequacy. When we  
21 set the RMAX, when we set the allowable  
22 differential, it tells us two things. First, it

1 tells us how many shippers are going to get  
2 relief, and second, it tells us how much relief  
3 they're going to get, assuming that they qualify.  
4 So, for example, it's very intuitive. If we  
5 started out with a low level of our max, such as  
6 1.6, well, it's clear that all three of these  
7 shippers would qualify for at least some degree  
8 of rate relief because they're all starting out  
9 with the ratio above 1.6.

10 In particular, shipper B would qualify  
11 for a modest amount of relief because it would  
12 only take a small adjustment in its rate to put  
13 it right back down to 1.6. It's starting out at  
14 1.67. Shipper C would qualify for a lot more  
15 relief because it's starting out at 2.25.

16 Alternatively, we can select an RMAX equal to  
17 1.9. In this case, only two out of the three  
18 shippers would qualify for any rate relief at all  
19 because shipper B's ratio is already below 1.9.

20 Shippers A and C would both qualify for rate  
21 relief, although they would qualify for less rate  
22 relief than they would have qualified for if the

1 RMAX were 1.6 instead of 1.9. And the same  
2 exercise goes through for an RMAX of 2.1. In  
3 that case, only shipper C qualifies for rate  
4 relief, and it qualifies for less rate relief  
5 than it would have qualified for under the other  
6 two scenarios. The point of this is, whatever  
7 the results of the regression model ultimately  
8 adopted by the STB, and we don't know what those  
9 are going to be, it would be a much more  
10 complicated model. RMAX could always be  
11 calibrated to target rate relief to a fixed  
12 percentage of potentially captive shippers. As  
13 the TRB observed, when it endorsed the benchmark  
14 method, the benchmark method "should not threaten  
15 revenue adequacy because regulators would be able  
16 to set the strictness of the screen, that is, the  
17 amount by which a rate can exceed its predicted  
18 competitive level before being subject to a  
19 challenge."

20 One approach that the STB could think about  
21 taking would be setting a relatively high, so a  
22 relatively conservative value of RMAX initially,

1 engaging the effect, if any, of this rate relief  
2 on revenue adequacy, and then gradually relaxing  
3 it over time. In conclusion, what the yardstick  
4 approach accomplishes is to A, preserve  
5 differential pricing to captive shippers because  
6 you'll notice no matter where we set our max  
7 there is still differential pricing literally  
8 built into the system. Everyone is going to be  
9 paying more than what a comparable competitive  
10 shipper pays for any are greater than one.

11 So we preserve differential pricing  
12 and we also target rate relief to the shippers  
13 that face the steepest over charges relative to  
14 competitive levels, because, again, no matter  
15 where we pick our max the shippers that are  
16 facing the steepest over charges are the most  
17 likely to qualify for relief, and are going to  
18 qualify for a higher level of relief than other  
19 shippers. And now I'll turn it back to Mr.  
20 Moreno.

21 MR. MORENO: We believe that the  
22 yardstick approach is probably the preferred

1 approach that we are going to present this  
2 afternoon, but the key to the yardstick approach  
3 is to be able to identify railed shipments that  
4 face meaningful competition because those are the  
5 benchmarks in which we're inputting into this  
6 regression analysis. That's probably also the  
7 most challenging aspect of implementing this  
8 approach. The TRB has identified certain fields  
9 in the Costed Waybill Sample that are indicators  
10 of meaningful competition, and they also link  
11 some of those fields to outside data sources to  
12 bring in additional information, but that's  
13 probably only a start. More information is  
14 likely to be useful and necessary to implement  
15 this approach. The board itself could expand  
16 data needed in the Costed Waybill Sample to  
17 capture some of the additional fields or  
18 information that would be needed to implement  
19 this approach. It also could be appropriate for  
20 the STB to conduct studies through formal  
21 proceedings, somewhat of a blend of a market  
22 dominance determination and a commodity exemption

1 proceeding, for example. To identify the  
2 attributes of affected competition for specific  
3 types of commodities that could be applied in an  
4 objective manner to declassify the Costed Waybill  
5 Sample as either captive or competitive to give  
6 you a pretty solid determination of what those  
7 are.

8           The yardstick approach, although it  
9 would require substantial initial investment of  
10 time and resources by the board and it's  
11 stakeholders. The process would be relatively  
12 easy to implement and update thereafter. An  
13 alternative to the yardstick approach that could  
14 be implemented more immediately is the rebate  
15 approach that you've heard so much maligned  
16 yesterday. Dr. Caves will begin by addressing  
17 the conceptual underpinnings of the rebate  
18 approach, and Mr. Crowley would then illustrate  
19 two potential ways to implement the rebate  
20 approach that are based upon methodologies  
21 already familiar to the board and upheld by the  
22 courts. Mr. Crowley will refer to these two

1 rebate alternatives as the proportional reduction  
2 method or of the MMM, maximum markup method.

3 DR. CAVES: Thank you. The rebate  
4 approach, the objective of the rebate approach is  
5 to combine the efficiency properties of  
6 differential pricing with some limitation on the  
7 railroad's ability to exploit its monopoly  
8 position vis a vie captive shippers. The idea of  
9 the rebate approach is to take a portion of the  
10 railroad surplus revenue, only a portion, and put  
11 it in a pool that is potentially subject to  
12 rebating to captive shippers in the form of lower  
13 rates. So just to clarify, by surplus revenue,  
14 we mean revenue above and beyond what the  
15 railroad requires to remain revenue adequate. So  
16 the rebate approach takes only a portion of that  
17 surplus and protects the contribution made to  
18 surplus revenue by any presumptively competitive  
19 traffic. There are two approaches, two  
20 variations that we'll talk about as to how the  
21 rebate approach could be implemented. The first  
22 we'll call the proportionality approach. This

1 one adheres most closely to Ramsey Principles in  
2 the sense that shippers with lower demand  
3 elasticities should pay higher rates, according  
4 to Ramsey Principles. So the proportionality  
5 approach attempts to adhere to that.

6 The maximum market method, on the  
7 other hand, targets shippers paying the highest  
8 rates, and this is more consistent with what I  
9 understand to be the long cannon factors in this  
10 statute. At the same time, the maximum markup  
11 method is still very much consistent with Ramsey  
12 Pricing Principles because, as we saw earlier,  
13 any adjustment of price towards marginal costs  
14 will increase the efficiency of the pricing  
15 system, according to Ramsey pricing. And with  
16 that, I'll turn it over to Mr. Crowley.

17 MR. CROWLEY: Continuing with the fact  
18 that actual data shows that UP is revenue  
19 adequate over the six year business cycle from  
20 2009 through 2014 I developed the example on the  
21 screen to show how the rate reduction would be  
22 applied to captive traffic following the

1 proportional reduction approach. The example  
2 begins with actual UP 2014 revenues on line one.  
3 The actual average UP revenue surplus over the  
4 six year business cycle that I discussed earlier  
5 is shown on line two. Line three identifies the  
6 percent of aggregate excess surpluses provided by  
7 captive shippers. This allocation to captive  
8 shippers is calculated as follows: Using the  
9 traffic and revenue data from either the  
10 railroad's records or the STB's confidential  
11 Waybill sample, each movement will be arrayed  
12 from highest to lowest based on its RVC ratio.  
13 Using one hundred eighty percent RBC as the  
14 demarcation point, all movements with RBC ratios  
15 less than one hundred eighty percent would be  
16 considered competitive, and all movements with  
17 RBC ratios equal to or greater than one hundred  
18 eighty percent would be considered captive.  
19 Using the ERC's based costing approach, the  
20 railroad's fixed cost will then be allocated to  
21 each movement to develop total cost per movement.  
22 The excess revenue per movement will next be

1 developed by subtracting each movement's total  
2 cost from its revenues, and then summed across  
3 the competitive and potentially captive groups to  
4 calculate net excess revenues for each of the two  
5 groups. The potentially captive excess return  
6 share will then be calculated by dividing the  
7 potentially captive shippers aggregate net  
8 access, net excess revenues by the sum of the net  
9 excess revenues for potentially captive and  
10 presumptively competitive group. For purposes of  
11 this example, I have assumed that the mix of  
12 traffic handled by UP, ninety percent of excess  
13 revenues from captive traffic as shown on line  
14 three.

15 Line four identifies the excess revenues that are  
16 available to captive shippers by multiplying line  
17 two times line three. Line five shows the 2014  
18 aggregate UP required revenues, assuming the  
19 captive excess revenue is line four. I  
20 subtracted from the total UP 2014 revenues. The  
21 margin adjustment factor is shown on line six.  
22 The margin adjustment factors calculated using an

1 iterative process which reduces all rates above  
2 one hundred eighty percent in relative proportion  
3 until aggregate UP revenues showed on line 14,  
4 column 11, equal UP target revenues shown on line  
5 five. In this example, the margin adjustment  
6 factor equals 95.1 percent. I next assume that  
7 UP handled the seven shippers shown or identified  
8 in column one. For each shipper I assumed a  
9 column two rate, a column three variable cost,  
10 and a column four annual volume. The aggregate  
11 revenues in column five for each shipper equal  
12 the rate in column two times the annual volume in  
13 column four. The total on line 14, column five  
14 equals the line one UP total 2014 revenues. The  
15 RBC ratio for each movement is shown in column  
16 six and is calculated by dividing column two rate  
17 by the column three variable cost.

18 The elasticity margin or the price cost margin is  
19 shown in column seven. The first adjustment is  
20 made to the column seven elasticity or price cost  
21 margin ratios through application of the margin  
22 adjustment factor appearing on line six. The

1 margin adjustment factor reduced the base  
2 elasticity margin, column seven, to the adjusted  
3 elasticity margin, column eight. By applying the  
4 same margin adjustment factor to all above one  
5 hundred eighty percent shippers, the elasticity  
6 margins remain in relative proportion to each  
7 other. Once the column eight adjusted elasticity  
8 margin are identified, the adjusted rates, RBC  
9 ratios, and total revenues can be calculated as  
10 shown in columns nine, 10, and 11. Also note  
11 that the total adjusted revenues on line 14,  
12 column 11 equal the UP required revenues  
13 calculated on line five above. In this example,  
14 shipper A is the complaining shipper, and  
15 therefore, the only movement whose rate is  
16 subject to relief. This is reflected in column 12  
17 with only the revenues for shipper A reflects a  
18 revenue reduction. The total surplus revenue  
19 subject to rebate, line four, would be exhausted  
20 only if shippers B, C, and D also filed  
21 complaints and could prove market dominance.  
22 Otherwise, UP would retain that revenue for

1       itself. In addition, UP retains all the surplus  
2       revenue attributed to the below one hundred  
3       eighty percent traffic, shippers E, F, and G in  
4       this example, which means that UP's revenue would  
5       never be kept at the revenue adequacy level,  
6       which is line one minus line two.

7                 The second example following the  
8       rebate approach is the maximum markup  
9       methodology, the example is similar to the  
10      example we just discussed from an input  
11      standpoint. The primary difference appears in  
12      columns six where the MMM approach that the STB  
13      has developed in its standalone or simplified  
14      standalone models is used to allocate the  
15      surpluses. Otherwise, all of the facts that I  
16      just discussed would apply equally here. For  
17      time reasons we'll pass it back to Mr. Moreno.

18                MR. MORENO: In developing both  
19      variations of the rebate approach, we wanted to  
20      respond to railroad concerns that a revenue  
21      adequacy constraint would be tantamount to rate  
22      of return regulation, that deprives them of

1 incentives to invest in their infrastructure.  
2 Dr. Caves will explain how our proposals are  
3 different from rate of return regulation, and  
4 also discuss the impact of our proposals on the  
5 railroad's ability to invest and expand capacity  
6 in response to this specific question which was  
7 raised in the board's hearing notice.

8 DR. CAVES: Thank you. Under rate of  
9 return regulation, the regulator adjusts all of  
10 the prices that the utility or the regulated  
11 entity is allowed to charge, to guarantee a fixed  
12 return on the utilities assets. This is not what  
13 either of the methods we are doing proposes, just  
14 to be very clear. The yardstick approach, or the  
15 benchmark approach clearly doesn't do this. It  
16 makes no reference to returns of any kind. It's  
17 simply a method for setting competitive rates in  
18 areas where competition does not appear to be  
19 present. Economists would call that price cap  
20 regulation, which is not the same at all as rate  
21 of return regulation, and it's generally  
22 preferred by most economists as doing a better

1 job of preserving railroads incentives or the  
2 regulated entities incentives to achieve  
3 profitability and efficiency.

4 So that covers the benchmark approach. The  
5 rebate approach is also not equivalent to rate of  
6 return regulation. Most fundamentally because  
7 the rebates only include surplus revenue that can  
8 be attributed to potentially captive shipments.

9 All of the railroad's surplus revenue, as we've  
10 just reviewed, all of the railroad's surplus  
11 revenue attributable to competitive traffic is  
12 completely off limits under the rebate approach.

13 So we just want to make that absolutely clear.

14 Therefore, the more profit the railroad can earn  
15 from its presumptively competitive routes, the  
16 less there will be available for rebate under  
17 that approach. In addition, of course, under the  
18 rebate approach, all rebates would remain purely  
19 hypothetical unless and until a shipper  
20 successfully brought a case before the STB. And  
21 similarly, for the yardstick approach, no shipper  
22 would be able to actually receive any rate relief

1       until it proved that it was paying rates  
2       substantially above the competitive level and it  
3       would also have to show market dominance as well,  
4       of course.

5                       So just to wrap up, the other  
6       fundamental reason why our proposals would not  
7       limit returns and would not discourage investment  
8       is that, again, by definition, the revenue  
9       adequacy standard protects a railroad's ability  
10      to remain profitable and attract investment. And  
11      it does this in a conservative way because as I  
12      alluded to before, the STB's revenue adequacy  
13      determinations are themselves conservative. We  
14      can see this very clearly, because according to  
15      the STB's revenue adequacy determinations, the  
16      industry should not have been able to attract the  
17      billions of dollars in investment in capital.  
18      But it has, in fact, attracted over the recent  
19      decades.

20                      The economist for the AAO yesterday  
21      made this point fairly clearly. When Dr. Brenner  
22      pointed out in his testimony that the railroads,

1 as rational firms, would not and should not make  
2 investments in which the rate of return is less  
3 than the cost of capital, and if I could continue  
4 just for one more moment to finish my thought.  
5 Thank you. So Dr. Brenner pointed out that the  
6 railroads would not make investments in which the  
7 rate of return is less than the cost of capital.  
8 I most certainly agree with that. That is very  
9 much consistent with basic principles and  
10 economics. The railroads and their investors  
11 should only be willing to make investment for  
12 which the rate of return exceeds the cost of  
13 capital. But guess what? As the railroads have  
14 reminded us, they have, in recent years and  
15 decades, made enormous multi-billion dollar  
16 investments. So while telling us all about these  
17 investments, the railroads and our economists  
18 want us to believe that they've also consistently  
19 failed to earn sufficient returns to cover their  
20 cost of capital over the same time frame. If  
21 that's true, then why in the world did the  
22 railroads keep making these billions and billions

1 of dollars in investment year after year, decade  
2 after decade? Again, I'll just give you the  
3 figures, one hundred sixty-eight billion since  
4 the great recession, two hundred forty-four  
5 billion in the last ten years, and three hundred  
6 ninety-four billion in the past twenty years.

7 The vast majority of that time they would have  
8 been found revenue inadequate. So why did the  
9 railroad's project manager keep recommending  
10 projects that didn't return enough to cover their  
11 weighted average cost of capital, and why on  
12 earth did the executives keep approving these  
13 multi-billion dollar boondoggle investments? And  
14 how on earth did the railroads manage to keep  
15 going back to the capital markets year after year  
16 raising billions of dollars to fund these  
17 supposedly awful investments? Well, the reality  
18 has to be that the railroads and their economists  
19 are either underestimating the true returns to  
20 investment, over estimating the true cost of  
21 capital, or both. And the reality also has to be  
22 that the STB's revenue adequacy determinations

1 are very conservative, they tend to understate  
2 the railroad's ability to attract capital,  
3 historical data prove that. Therefore, the STB  
4 should have greater confidence in adopting this  
5 highly conservative standard if it decides to  
6 regulate based on revenue adequacy.

7 MR. MORENO: In the interest of time,  
8 I'll just mention very quickly that we also have  
9 proposed an alternative for shippers to contest  
10 just the rate increase. This is essentially the  
11 same alternative that Western Coal Traffic League  
12 proposed yesterday. Once a captive shipper  
13 demonstrates market dominance and revenue  
14 adequacy at current levels, the STB may  
15 reasonably conclude that further increases in the  
16 differential pricing are presumptively  
17 unreasonable. Chairman Elliott, yesterday you  
18 asked the question about are rebuttable  
19 presumptions consistent with the APA. If you're  
20 still interested in that I invite you to ask me  
21 the question. I won't take up more time on that  
22 at the moment, and I would just quickly wrap up

1 by noting that prior to this hearing we submitted  
2 a more detailed and written explanation in a  
3 narrative on today's testimony into the record.  
4 This was submitted, I believe, on Monday. That  
5 narrative contains a further detailed explanation  
6 to help you work through the examples we've done  
7 today, and our proposals for implementing, and we  
8 encourage the board to consult that narrative to  
9 better understand what we have proposed. With  
10 that, I'll defer to the board to any questions  
11 you may have.

12 MR. ELLIOTT: Thank you very much.

13 MS. BEGEMAN: First, thank you for the  
14 effort that you went to to respond to the board's  
15 request for ideas and comments and testimony.  
16 Certainly, what you supplied earlier this week is  
17 helpful in understanding your creative proposal.

18 MR. MORENO: I'm sorry, could I ask  
19 you to speak more directly into the microphone.  
20 I'm having a little difficulty.

21 MS. BEGEMAN: Okay. I'm not sure if  
22 this is for Mr. Crowley or for you, sir, but I

1 think that in your testimony, with respect to the  
2 rebate reduction approach, really, whichever  
3 version I think the question applies to, but I  
4 think that you said that the board would have the  
5 ability to determine what portion of revenues  
6 would be included in the rebate reduction  
7 approach. So you could, rather the board could,  
8 sort of control how much of the excess revenues  
9 would be at risk or at issue, but then, I think  
10 Mr. Crowley when you walked us through your  
11 proposals it seemed like it was a pretty clear  
12 number based on mathematics, and so I'm not  
13 really sure which I should believe.

14 DR. CAVES: Yes, I think I can clear  
15 that up. The situation in which the board would  
16 be able to sort of calibrate the RMAX, I believe  
17 that's what you're referring to. That was  
18 actually referring to the yardstick approach. So  
19 under the yardstick approach, the RMAX that the  
20 board is able to set, that defines the extent to  
21 which a shipper's rate, captive shipper's rate is  
22 allowed to exceed the competitive benchmark.

1 That only applies to the yardstick model.

2 MS. BEGEMAN: Okay.

3 DR. CAVES: So the other percentage,  
4 you're quite right, is based on a calculation  
5 that Mr. Crowley can describe in more detail.

6 MS. BEGEMAN: It's more firm?

7 DR. CAVES: It's, well, Yes, the data  
8 tells you what it is, Yes.

9 MR. MORENO: Tom, do you want to add  
10 anything in terms of how the rebate approach,  
11 which is more quantitative?

12 MR. CROWLEY: In the example we had  
13 ninety percent as the factor, and obviously that  
14 was an estimate. We don't have the data to make  
15 the actual calculation, but the idea is you could  
16 make the actual calculation based on the  
17 assumptions that we outline in our testimony. We  
18 start with one hundred eighty percent is the  
19 demarcation point and anything to the left of one  
20 hundred eighty percent or anything with RVC  
21 ratios less than that would be presumptively  
22 competitive traffic, and anything to the right of

1 that or greater than one hundred eighty percent  
2 would be presumptively captive. And you can  
3 calculate for each one of those movements the  
4 amount of revenue over total cost per movement  
5 that exists, and by summing those up and each of  
6 those two parts, you get two parts of money and  
7 captive divided by the sum of the two parts  
8 equals the ninety percent I was explaining to  
9 you, so that could be done each year for each  
10 carrier and apply to the surplus revenues  
11 resulting from revenue adequacy calculations.

12 MS. BEGEMAN: So it's a limit or a cap  
13 ultimately?

14 MR. CROWLEY: It's kind of a floor.  
15 In other words, through this methodology, we will  
16 not assign any revenues that were contributed by  
17 competitive traffic to captive traffic through  
18 this application.

19 MR. MORENO: And if I can go back to  
20 one of the examples that we were using I think  
21 it's important to note Mr. Crowley identified to  
22 types of money, the below one hundred eighty,

1 which we're calling the presumptively captive  
2 traffic because of the jurisdictional threshold,  
3 and the, or excuse me, presumptively competitive  
4 traffic, and the above one hundred eighty, which  
5 we are describing as the potentially captive  
6 traffic, same phrase the board has repeatedly  
7 used to describe it. We are not touching the pot  
8 of money in the presumptively competitive group  
9 at all. And when we're looking at the, so none  
10 of that gets redistributed. And when we were  
11 looking at the above one hundred eighty group we  
12 are allocating, we're taking the contribution to  
13 unattributable costs from just that group and  
14 then spreading it back by one of the two methods,  
15 proportional or the MMM method across all of the  
16 one hundred eighty traffic, so to take this  
17 example that we have up here, let's assume that  
18 get shippers A, B, C, and D, if you look at  
19 column 11 you see, and you compare that to column  
20 five, the approach distributes the excess revenue  
21 back to all of shippers A, B, C, and D. Now, but  
22 first of all, we only have one complaint in this

1 example, A, so in the example, A is the only one  
2 who gets any relief. Number two, let's assume  
3 that B, C, and D --

4 MS. BEGEMAN: Don't you think the  
5 other letters will pay attention?

6 MR. MORENO: I'm sorry?

7 MS. BEGEMAN: Don't you think the  
8 other letters will pay attention?

9 MR. MORENO: Yes, yes, so that's where  
10 I'm going now. Now, assume B, C, and D also file  
11 complaints. Well, first of all, each one of them  
12 has to prove market dominance. Let's say B filed  
13 its complaint and it cannot prove market  
14 dominance. The railroad contains that excess  
15 revenue that's otherwise allocated to shipper B.  
16 And let's say, but if C files a complaint and it  
17 prevails and by showing market dominance it would  
18 be entitled to its allocated share here. The  
19 point being that shippers who don't bring  
20 complaints and shippers who don't prove market  
21 dominance above the one hundred eighty group, the  
22 railroad keeps that revenue because we have made

1 sure that the entire pot of money is at least  
2 hypothetically distributed across every above one  
3 hundred eighty shipper. And only those who  
4 prevail on a complaint get their allocated  
5 portion of that. So there's no way we can drain  
6 the swamp unless every single above one hundred  
7 eighty shipper files a complaint and proves  
8 market dominance. And in that case, the swamp  
9 should be drained, under an example, but that's  
10 unlikely to happen.

11 MS. BEGEMAN: Could you help me  
12 understand dead weight loss?

13 DR. CAVES: Dead weight loss, oh,  
14 sure. I could really use another slide now.

15 MS. BEGEMAN: That's okay, I mean, I  
16 have them all here.

17 DR. CAVES: Okay. No, I mean, it's  
18 just easier if you draw it on a white board. But  
19 the basic idea when economists talk about  
20 efficiency, the idea is you're trying to figure  
21 out that you have a market for any good, right?  
22 You've got an upward sloping supply curve, you've

1 got a downward sloping demand curve. If nothing  
2 interferes with supply and demand, then wherever  
3 those two intersect is going to be where you find  
4 an equilibrium, and that's going to tell you the  
5 price and the quantity. The price at which the  
6 good will be sold and the quantity is sold. And  
7 as long as supply is meeting demand, then there's  
8 no dead weight lost in the system. And the  
9 reason is every single unit of the product is  
10 produced as long as the value to society of  
11 producing that unit is greater than the cost to  
12 society of supplying the unit. So that's the  
13 basic way to measure efficiency in economics. If  
14 the benefit is bigger than the cost it's  
15 efficient for that thing to be produced, for that  
16 item to be brought to market. So the problem  
17 that comes up with monopoly pricing is that the  
18 monopolist does not want to charge a competitive  
19 price. The monopolist wants to charge the  
20 monopoly price, which is significantly higher.  
21 Why? Because that'll maximize the monopolist  
22 profits. And the reason economists don't like

1 monopoly pricing is not so much that the  
2 monopolist gets a "unfair amount of profit." The  
3 problem is that the only way the monopolists can  
4 earn that profit is by restricting the quantity  
5 supplied below the competitive level, right?

6 That's how you get prices higher, you've got to  
7 restrict supply. And as soon as you start  
8 restricting supply you're going to be producing  
9 fewer unit than you would under a competitive  
10 situation. And that means there are going to be  
11 a whole bunch of people that don't get to buy the  
12 unit, even though they value it more than it  
13 costs society to provide it. It's sometimes  
14 referred to as, I wish I had a whiteboard. You  
15 refer to --

16 MS. BEGEMAN: I'm glad you don't.

17 DR. CAVES: But I can assure you, if  
18 you look, if you talk to any of the economists in  
19 this room or if you look in any economics  
20 textbook, that's a very fundamental premise of  
21 microeconomics.

22 MS. BEGEMAN: Mr. Roman, I don't mean

1 to put you on the spot, but the last sentence of  
2 your testimony -- I don't know if you were  
3 reading from a written testimony, but could you  
4 repeat what you said, or maybe you were just  
5 going off the top of your head, but --

6 MR. ROMAN: No, the last sentence I  
7 said in order for the board to control service  
8 it's going to need to have some type of control  
9 over how much of the increase in profit the  
10 railroads are making from rate increases go back  
11 into the system. My testimony demonstrated that  
12 there was a very large portion of operating  
13 profits that the railroads made, which were going  
14 to the stockholders, leaving the rail system, and  
15 there isn't any, as far as I know, isn't any  
16 regulation to try to regulate that. I think the  
17 railroads are --

18 MS. BEGEMAN: I think that's probably  
19 a good thing.

20 MR. ROMAN: I'm sorry?

21 MS. BEGEMAN: That there's not  
22 regulation to regulate that. But back to some of

1 your pie charts. I know you were trying to make  
2 a point, but to say a car load is a car load  
3 doesn't seem like a fair statement. I think you  
4 used BNSF as the example, what car loads they  
5 were moving, although the number may be very  
6 comparable to 2005 to 2014. The makeup of those  
7 car loads are very different in the type of  
8 investment or the type of service. I mean, with  
9 the crude oil in North Dakota, all that they've  
10 had to do to accommodate those requests for  
11 service. Certainly, there's a lot more to it, I  
12 think, than just what you were showing on your  
13 pie charts.

14 MR. ROMAN: Well, actually, the line  
15 graph, we've had the annual car loads each year  
16 with the railroad. I mean, your point is if a  
17 car load is not a car load in 2014, even though  
18 the car loads were the same, very similar to  
19 2005.

20 MS. BEGEMAN: In number.

21 MR. ROMAN: Different distribution on  
22 the railroad system, it could be more intermodal

1 or less intermodal. It could be a lot of  
2 different things. The point being raised is that  
3 the railroad's capital investments appear to be  
4 maintained in existing systems. Specifically  
5 when you get into the crude oil and you get into  
6 the frac sand movements, which are probably more  
7 important to rail than the crude as we go out  
8 into the future. Investments could have been  
9 made for that years before all these movements  
10 actually started. They knew a lot of this was  
11 going to happen, but the railroads held back  
12 investing capital in a lot of areas. And that  
13 was the reason that you had service issues out  
14 there. It didn't have the infrastructure to  
15 support it. So it's a question of are the  
16 railroads investing to maintain the existing  
17 system, or are they investing to increase the  
18 capacity of the system for what could be  
19 happening next year or the year after, or five  
20 years from now. And the service parameters that  
21 we looked at there demonstrated that service  
22 isn't improving and those capital expenditures

1 appear to be going in the direction of just  
2 maintaining the existing system.

3 MS. BEGEMAN: Well, maybe you could  
4 help me understand it if I ask it a different way  
5 because I'm not quite following. But I think  
6 that the advertisement on WTOP is that the  
7 railroad industry is putting in twenty-nine  
8 billion dollars this year of investment, and  
9 you're saying that the board should ultimately  
10 control and dictate even more for investment  
11 purposes rather than it going to the  
12 shareholders?

13 MR. DONOVAN: No, that's not the  
14 position of the concerned shippers. Sorry, Jay.

15 MS. BEGEMAN: Okay, because that was  
16 actually the message I was getting.

17 MR. DONOVAN: I understand that last  
18 sentence in this testimony I hadn't heard before.

19 MS. BEGEMAN: Okay.

20 MR. DONOVAN: I think Dr. Caves just  
21 gave you the economic reality of what happens  
22 with dead weight loss. And the point that he

1 made there is that when monopolists go up to the  
2 monopoly price they do not want to increase  
3 supply. In the railroad industry that means they  
4 do not want to increase their capacity to move  
5 more traffic. So, Jay Roman's data reflects, I  
6 think clearly, that the railroads have not  
7 expanded their capacity over the last ten years  
8 even though they've made a lot of money. They  
9 have put twenty-nine billion, whatever the number  
10 is, into maintaining new tunnels --

11 MS. BEGEMAN: That's just for this  
12 year.

13 MR. DONOVAN: Well, whatever, but new  
14 tunnels, you heard two hundred fifty million  
15 dollar tunnel. Well, the tunnel is going to fall  
16 down. Of course they had to replace the tunnel,  
17 or whatever other infrastructure investment you  
18 need to make to keep the system running. That  
19 could be a lot of money. The railroad is highly  
20 capital intensive. We know that. That doesn't  
21 mean that the railroad industry is going to  
22 expand its capacity. Now, we're not here to tell

1 you that you should regulate how the railroads  
2 invest their money. That's not what we're doing  
3 here.

4 MS. BEGEMAN: Okay, good.

5 MR. DONOVAN: What we are doing here  
6 is saying we saw a parade of economic witnesses  
7 and others come in yesterday and say oh, my god,  
8 don't reduce our rates because if you do we will  
9 not have money to expand our system, and what Mr.  
10 Roman's numbers show you is that they're not  
11 expanding their system, and what Dr. Caves tells  
12 you is they won't expand their system. There is  
13 no economic incentive for these four effectively  
14 monopoly railroads to expand their systems. So  
15 don't think that by putting in a revenue adequacy  
16 test or restraint or constraint that somehow or  
17 another you're going to prevent the railroads  
18 from expanding their systems because they're not  
19 going to expand their systems.

20 MS. BEGEMAN: But by expansion do you  
21 mean that they have to have more miles in  
22 operation? Technology, I think, is one of the

1 reasons that they haven't had to expand.

2 MR. DONOVAN: That may be true, but  
3 you're having service problems. How are you  
4 having service problems when they've got all this  
5 money? The fact is, they're not interested in  
6 expanding. Even the TRB report says they don't  
7 understand why the railroads aren't putting more  
8 money into their system so they can serve all the  
9 profitable traffic. They're not doing that  
10 because they don't want to do that. Dr. Caves  
11 explained why they won't do that. They're  
12 monopoly pricing. They love that dead weight  
13 loss, but the shipper, i.e., the society, i.e.  
14 our economy, doesn't love that loss. That's the  
15 point we're trying to make. We're not telling  
16 you to regulate investment, no. But we are  
17 telling you is don't think that you should not  
18 put in a revenue adequacy constraint because  
19 somehow it's going to prohibit the railroads from  
20 investing money that they're not going to invest  
21 anyway.

22 MS. BEGEMAN: I'll turn it over to you

1 at this point.

2 MS. MILLER: So, Dr. Caves, I want to  
3 go back and make sure I was understanding this  
4 correctly. I thought, if I get on my right page,  
5 that the point you made when you said the total  
6 amount that railroads had invested since the  
7 recession, 168 million over two years, two  
8 hundred forty over twenty years, three-hundred  
9 ninety-four --

10 DR. CAVES: Oh, Yes.

11 MS. MILLER: Is what you were saying,  
12 is the sheer fact that those numbers are out  
13 there tells you that they must be revenue  
14 adequate because they wouldn't do that if they  
15 weren't revenue adequate? Is that what I  
16 understood you to say?

17 DR. CAVES: Yes, it tells me that a  
18 measure of revenue adequacy that says that the  
19 railroad is revenue inadequate, and therefore  
20 unable to attract capital must be conservative if  
21 the railroad were, in fact, attracting sufficient  
22 capital to make these investments over that time

1 frame.

2 MS. MILLER: And if it's not possible  
3 it's not a big, can you go back to one of those  
4 charts, one of Dr. Crowley's charts? On the  
5 rebate approach. Okay, so this one. Is line  
6 number five, are you saying that's the amount  
7 that they would have charged to their competitive  
8 traffic, and as a consequence that's an amount  
9 that should clearly be retained and not a part of  
10 the calculation?

11 MR. CROWLEY: On line five?

12 MS. MILLER: It's called UP required  
13 revenues.

14 MR. CROWLEY: That's the amount after  
15 you strip out the contribution to the surplus by  
16 the competitive traffic. So that's amounts that  
17 --

18 MS. MILLER: You're saying that what  
19 you're calling the surplus came from competitive  
20 traffic, not from captive traffic?

21 MR. CROWLEY: No, the surplus in total  
22 is shown on line two.

1 MS. MILLER: Line two.

2 MR. CROWLEY: And what we want to do  
3 is take out of line two that portion that was  
4 contributed by competitive traffic, so we strip  
5 that out.

6 MS. MILLER: But is that line five?

7 MR. CROWLEY: And that is line five.

8 MS. MILLER: Okay, so you'd say that  
9 that amount in this case, 22.7 --

10 MR. MORENO: Yes, mathematically,  
11 those lines actually follow one another. You  
12 start with UP's total revenues of 23.8 million in  
13 line one. We've calculated the surplus as 1.273  
14 million dollars. Now, and what we've now taken  
15 is line three takes ninety percent of line two to  
16 generate line four. And line one minus line four  
17 equals line five. So what that ninety percent  
18 represents, and this is a hypothetical, the  
19 ninety percent is the portion of line two that  
20 was contributed by above one hundred eighty  
21 shippers.

22 MS. MILLER: Okay.

1 MR. MORENO: So that creates the above  
2 one hundred eighty pod of money.

3 MS. MILLER: Okay.

4 MR. MORENO: And everything that's  
5 left over is the below one hundred eighty.

6 MS. MILLER: Okay.

7 MR. MORENO: Now, whether ninety is  
8 the true number or not, we don't know, that's a  
9 number we picked out of the air.

10 MS. MILLER: Yes, okay. So, one of  
11 the things that I'm curious about, going back to  
12 the TRB study and the way you've looked at doing  
13 this, they also said that URCS is desperately  
14 flawed and you shouldn't try to fix it, but the  
15 one hundred eighty comes out of URCS, correct?  
16 So are you uncomfortable with the notion that our  
17 current way of figuring out who's above and below  
18 one hundred eighty is coming from a system that,  
19 at least, you know, some set of researchers?

20 MR. MORENO: I would add at the  
21 beginning, the pretext or the guidelines that we  
22 used for calculating this, one of those

1 guidelines enumerated up front is consistent with  
2 current statute.

3 MS. MILLER: Yes, true.

4 MR. MORENO: What the board can do  
5 today. You know, what the TRB is concerned about  
6 is a policy debate that can be had down the road,  
7 but we need to deal with what we have in front of  
8 us right now and the tools that we have, and  
9 that's how we come up with this approach.

10 MS. MILLER: And then, particularly,  
11 I guess, it would be on the benchmarking  
12 approach. In order to do that, I mean, the way I  
13 understood what TRB did was they used the  
14 information that could be derived from the  
15 waybill sample.

16 DR. CAVES: Combined with some other  
17 data, Yes.

18 MS. MILLER: And if we were truly  
19 going to use this as our method for regulation,  
20 is the information available through the waybill  
21 sufficient to create this kind of statistical  
22 model to predict what a competitive rate would

1 have been?

2 DR. CAVES: No, it'll get you most of  
3 the way there, but the TRB had to go outside the  
4 waybill, and they were able to go outside the  
5 waybill. They obtained information to try to  
6 approximate the availability of competitive  
7 alternatives from external data set. So they  
8 would take the location of a station, they would  
9 map it to a latitude and longitude from some  
10 other database and then figure out, okay, they  
11 basically constructed a crude metric. How many  
12 class one railroads are within ten miles? How  
13 many ports are within twenty miles? Mr. Moreno  
14 earlier was making the point that that's where  
15 you would probably want to consider something a  
16 little more precise. After all, the TRB was  
17 doing it illustratively.

18 MS. MILLER: Yes.

19 DR. CAVES: But that should be  
20 feasible. There would be some up front cost to  
21 it for sure. But supplementing the CWS with some  
22 reliable indicator of effective competition

1 should not be insurmountable. And we have more  
2 details on that in our written testimony.

3 MS. MILLER: So if one were interested  
4 in pursuing this sort of an approach, part of  
5 what it would require is, you know, sort of then  
6 figuring out where your comparable traffic is so  
7 you're comparing the rates back to comparable  
8 traffic?

9 DR. CAVES: Are there complications to  
10 that, you know, just sort of knowing what you  
11 really could call comparable and not comparable?  
12 Is that something that could be debated for  
13 years?

14 MR. MORENO: It's similar to a market  
15 dominance determination that you do in a rate  
16 case. It's similar to commodity exemption.

17 DR. CAVES: Oh, but it's more  
18 transparent than that, right? Sorry to  
19 interrupt. But at least, if you estimate a  
20 reliable model then you have a very transparent  
21 way of determining what traffic is comparable,  
22 right? Because the model tells you how the

1 different shipment characteristics relate to the  
2 rates.

3 MS. MILLER: Yes, so you would know  
4 what the characteristics are?

5 DR. CAVES: Yes.

6 MS. MILLER: So you're saying it's  
7 transparent because you can make a judgment call  
8 if you felt like, in fact, those characteristics  
9 were the same?

10 DR. CAVES: Well, and the model will  
11 tell you. You know, if there's some  
12 characteristic that doesn't matter, the model  
13 will tell you, hey, this coefficient is  
14 insignificant. Drop it out of the model, we  
15 don't need it. That's an objective standard that  
16 you can get. Sorry to interrupt.

17 MR. MORENO: And the illustrations  
18 that Dr. Caves used, he created very simplistic  
19 one that assumed there's just one variable of  
20 distance. Obviously, when we get into this  
21 you're going to have to come up with several  
22 variables.

1 MS. MILLER: Yes, so it was, I thought  
2 it was great that Vice Chairman Begeman asked  
3 about dead weight loss because I had that on my  
4 list too, but unlike her I wish you did have a  
5 whiteboard because, again, I'm pretty sure I  
6 would have understood it better if you were  
7 drawing on a whiteboard and by the time Mr.  
8 Donovan was finished with us I concluded that  
9 actually was a fairly important thing to  
10 understand.

11 MR. MORENO: He's creating his own  
12 whiteboard right now.

13 MS. MILLER: I know, I see that.

14 MS. BEGEMAN: I didn't wish to imply  
15 that I didn't think it was important to  
16 understand.

17 MR. CAVES: Is there a projector or  
18 something I can use? I can just kind of hold it  
19 up.

20 MR. MORENO: We don't have an opaque  
21 projector, but.

22 MS. MILLER: You can just come up

1 here.

2 MS. BEGEMAN: You can approach the  
3 bench.

4 DR. CAVES: All right, I can approach  
5 the bench? Okay. All right, so here's the way  
6 it works.

7 MS. MILLER: Do you want a microphone?

8 DR. CAVES: So I'm showing a supply  
9 and demand graft here. You've got upward sloping  
10 supply which shows the marginal cost of producing  
11 some product, it doesn't matter what it is,  
12 you've got demand, which shows how much people,  
13 consumers, society value the product, right? The  
14 more of the product that's produced, generally,  
15 the more it costs to produce it.

16 MS. MILLER: The more that's produced  
17 the more it costs to produce it?

18 DR. CAVES: Right, so marginal cost  
19 tends to increase. At some point, for example,  
20 the railroad just hits capacity and can't accept  
21 anymore shipments on this railroad, so the cost  
22 goes up. The cost curve could look different,

1 but that wouldn't materially affect it. Because  
2 you're right, the marginal cost tends to go  
3 downward, but this will make it more concrete.  
4 The demand curve slopes downward because the more  
5 you sell the lower the price you can sell it at  
6 is the basic idea.

7 MS. MILLER: Yes.

8 DR. CAVES: If we produced only this  
9 much, so suppose we're way back here at this  
10 quantity level, the demand would be very high.  
11 People would be willing to pay a very high price  
12 because it's in such short supply. On the other  
13 hand, the cost of producing that much is  
14 relatively low. So that tells us it's not  
15 efficient to be at this production level. You  
16 need to keep on moving to the right here until  
17 you get to this level, because when you're at  
18 this level you know that you've gotten to the  
19 point where it's the value that someone places on  
20 buying that product is just equal to the cost of  
21 producing that product. And the problem with  
22 monopoly pricing or any, you know, distortionary

1       taxation can do the same thing is that it will  
2       move you away from this optimal quantity, and  
3       there will be all this output that never gets  
4       produced, even though the benefits of producing  
5       it are greater than the cost of supplying it. So  
6       that's it.

7                   MS. MILLER: Thank you.

8                   DR. CAVES: Yes.

9                   MS. MILLER: Okay, I'm done. Thank  
10       you.

11                   MR. ELLIOTT: I think we'll probably  
12       have to enter that into evidence just because it  
13       was described and, I mean, take your time. I  
14       don't think it'll be controversial because you  
15       were explaining, I think, a basic economic  
16       principle.

17                   DR. CAVES: That should be very  
18       uncontroversial, yes.

19                   MR. ELLIOT: But I think just because  
20       it was a little unorthodox that we should at  
21       least have the exhibit in evidence for reference  
22       of the other parties. I just had a few

1 questions. First, with respect to the rebate.  
2 Yesterday we were discussing similar rebate  
3 proposals with the carriers and the carriers' one  
4 concern was it would have an asymmetric problem.  
5 Do you agree with that statement that you're only  
6 going to be recovering on the high end above  
7 revenue adequacy, but what are you going to do  
8 below it?

9 DR. CAVES: Is there going to be a  
10 problem? Which method were you asked about?

11 MR. ELLIOTT: The rebate.

12 DR. CAVES: The rebate method? So, of  
13 course, the issue here is that you will never, it  
14 doesn't really apply because regardless of  
15 whether you're on the upside or the downside you  
16 never go so far on the down side that you have a  
17 dis-incentive to invest. I think that's really  
18 the answer. The asymmetric regulation argument  
19 assumes that once you go on the downside, oh my  
20 gosh, your returns are so low that you're not  
21 earning it above your cost of capital, so why  
22 would we make a productive investment? But if

1 your returns never get that low it's a non-issue.

2 MR. MORENO: And under the rebate  
3 approach, the railroads can still earn above  
4 their cost to capital and retain that excess  
5 earning. All we're rebating here is the excess  
6 contribution from the captive shippers, the above  
7 one hundred eighty shippers. The railroad keeps  
8 the excess contribution from the below one  
9 hundred eighty shippers, and it also keeps the  
10 excess contribution from the above one hundred  
11 eighty shippers who aren't truly captive because  
12 they can't produce, or because they can't show  
13 market dominance. So to the extent the railroad  
14 is engaged in halves pricing of its competitive  
15 traffic, which is what UP, for example, in this  
16 proceeding, has attributed most of its financial  
17 success to. It keeps that revenue. We're not  
18 touching that. We're dealing with differential  
19 pricing of the truly captive market dominant  
20 shippers and refunding only their excess  
21 contribution.

22 MR. ELLIOTT: And back to the

1 benchmark model that you explained that was, I  
2 guess, also in reference to the TRB model,  
3 talking to the economists about -- I asked  
4 questions about that yesterday. With respect to  
5 their analysis they did not have a huge problem  
6 with it, the model itself, but their conclusion  
7 was that it would lead you back to something  
8 that's complex or similar to SAC. Do you agree  
9 with that, their analysis?

10 DR. CAVES: I don't agree. I don't  
11 agree and the TRB doesn't agree. The TRB had a  
12 long time to think about these issues and a long  
13 time to put that report together, and they had a  
14 various distinguished group of economists working  
15 in a, I think it was Dr. Colquitt in a non-  
16 disputatious environment, which is what he said  
17 he preferred, and they concluded that the  
18 yardstick approach was the way to go.

19 MR. ELLIOTT: Thanks. And also with  
20 respect to the yardstick approach, I know we're  
21 talking about it in the context of revenue  
22 adequacy, but were you looking to use that as a

1 broad measure or to be a trigger by revenue  
2 adequacy, just so I'm clear on that.

3 DR. CAVES: I mean, I think, well, I  
4 don't know what the official position is, but I  
5 think none of this stuff could be triggered until  
6 revenue adequacy were received, right?

7 MR. MORENO: Right, it would have to  
8 be revenue adequate in order to even employ the  
9 yardstick approach.

10 DR. CAVES: Yes.

11 MR. ELLIOTT: Okay, thank you.

12 DR. CAVES: And we would advocate  
13 using the methodology that Mr. Crowley  
14 demonstrated early on as to how you calculate  
15 revenue adequacy using the six year rolling  
16 average that you use the UP as an illustration.

17 MR. ELLIOTT: Final question, not  
18 completely on point, but we've been talking about  
19 the SAC test, and as you mentioned earlier in  
20 your testimony, I think you led off with it that  
21 it doesn't seem to be effective. You've been a  
22 very active practitioner on behalf of your

1 clients in these types of very complex chemical  
2 cases, and is there a reason why -- I can see  
3 that the SAC tests that you've brought are very,  
4 very complicated. Is there a reason why the  
5 shippers that you represent aren't bringing  
6 simplified SAC cases just to take some of the  
7 complexity out of it?

8 MR. MORENO: Yes, there's a couple  
9 reasons I can say about that. One is simplified  
10 SAC. The simplifications in simplified SAC tend to  
11 generate even higher rate levels simply because  
12 the primary simplification is the elimination and  
13 the opportunity to remove inefficiencies from the  
14 system for the SAC analysis. So, we start out  
15 probably at a higher rate level. Number two, the  
16 duration of the rate relief is only for five  
17 years as opposed to ten years in a SAC relief.  
18 Simplified SAC, although simplified, is still  
19 expensive. It's still over a million dollars,  
20 probably closer to two or three million dollars  
21 in actuality, and the Board recently made it more  
22 complex by even changing the road property

1 investment simplifications by making it more  
2 complex. So the amount the litigation costs of  
3 litigating simplified SAC for a return that is  
4 less for a short, that is a smaller return over a  
5 shorter period, it doesn't make the internal cost  
6 to capital from our client's perspective. I  
7 think it would be helpful if the board were to  
8 extend the duration and the remedy to ten years  
9 because I think it would make the economics of  
10 bringing a simplified SAC more attractive.

11 MR. ELLIOTT: Thank you, that's very  
12 helpful. Any other questions?

13 MS. BEGEMAN: Yes, could I?

14 MR. ELLIOTT: Sure.

15 MS. BEGEMAN: I might have two quick  
16 questions. A few times you mentioned the hurdle  
17 that each shipper would have to prove market  
18 dominance. I realize that it's not an automatic  
19 that a party is market dominant, but certainly  
20 the board has gone out of its way. I have not  
21 always agreed with what the board has done, but  
22 it has created a new limit price approach. Are

1       you suggesting that somehow the board's  
2       approaches for considering market dominance are  
3       overly restrictive? I mean --

4               MR. MORENO: No, I'm not here and I'm  
5       not intending to critique, in any sense, the  
6       Board's approaches to market dominance. I'm just  
7       making the point that market dominance must be  
8       proved before any shipper is entitled to their  
9       hypothetically allocated share of the rebate,  
10      otherwise the railroad retains that.

11              MS. BEGEMAN: Right, it's just that  
12      part of achieving that certain figure was that  
13      you'd already assumed they were within that  
14      captive traffic group, so --

15              MR. MORENO: Well, they were  
16      potentially captive.

17              MS. BEGEMAN: Right.

18              MR. MORENO: Right, above one hundred  
19      eighty is potentially captive, below one hundred  
20      eighty is presumptively competitive.

21              MS. BEGEMAN: Right.

22              MR. MORENO: There's probably captive

1 shippers below one hundred eighty too.

2 MS. BEGEMAN: Right.

3 MR. MORENO: We have to make some  
4 simplifications.

5 MS. BEGEMAN: And then just one last  
6 thing. With regard to the revenue adequacy  
7 constraint, from the very beginning of your  
8 testimony, I think you said that you supported  
9 Western Coal Traffic League's proposal?

10 MR. MORENO: We support Western Coal  
11 Traffic League's position in Ex Parte 664, and  
12 also that we had advocated a similar revenue  
13 adequacy constraint to Western Coal Traffic  
14 League as a constraint or limit upon rate  
15 increases once around.

16 MS. BEGEMAN: That's actually what I  
17 wanted to clarify, so you see it as a constraint  
18 on an increase?

19 MR. MORENO: Yes. And that would be  
20 an alternative. A shipper might decide, look, we  
21 don't want, it's still too complicated, too much  
22 time, we're not really interested in going and

1       trying a rebate approach or the market approach.  
2       We just want to keep our rates at a reasonable  
3       level and minimize the level of differential  
4       pricing.  If a carrier is already revenue  
5       adequate it should not be entitled to additional  
6       levels of differential pricing and that's the  
7       presumption that would come about as a result of  
8       this rate increase limitation.

9               MS. BEGEMAN:  Thanks for clarifying  
10       that.

11              MS. MILLER:  I wanted to go back  
12       because I'd meant to ask this earlier.  And so in  
13       terms of the time frame you would recommend six  
14       years and to do it as a rolling average as  
15       opposed to one of the parties yesterday was  
16       saying four years, but your recommendation says -  
17       -

18              MR. MORENO:  And I think we probably  
19       haven't made this point abundantly clear, but we  
20       believe measuring revenue adequacy should be  
21       based on a rolling six year basis because that's  
22       the average length of the business cycle in the

1 post-World War II area. We would then, on the  
2 flip side say that the rate prescription that  
3 comes from either the yardstick or the rebate  
4 approach would be for six years.

5 MS. MILLER: For two six years?

6 MR. MORENO: No, excuse me, would be  
7 six years.

8 MS. MILLER: Oh, thank you.

9 MR. ELLIOTT: Thank you very much for  
10 your testimony. Very much appreciated. Okay,  
11 why don't we begin with panel four?

12 MR. BISCHLER: Okay, great. Good  
13 afternoon, Chairman Elliott, Vice Chairman  
14 Begeman, and Commissioner Miller. My name is  
15 Paul Bischler, I'm the vice president of finance  
16 and the chief sourcing officer at BNSF Railway,  
17 and in my role I oversee the treasury group which  
18 handles the debt placements we do in both the  
19 private and public markets. I also oversee the  
20 risk management function, as well as the  
21 financial analysis that's done when we look at  
22 determining whether or not a project exceeds its

1 hurdle rate. Also, I've got the purchasing  
2 organization which supplies many of the resources  
3 we use to supply our capital infrastructure  
4 projects. So before I get started I did just  
5 want to comment on a few things. I appreciated,  
6 frankly, yesterday at the beginning of the  
7 testimony Chairman Elliott, you said that you  
8 wanted to make sure there was a thoughtful  
9 balance decision making in this proceeding, which  
10 I very much appreciated. Same thing to you,  
11 Commissioner, and Vice Chairman, and your  
12 comments around making sure we don't roll back  
13 the railroad industry. I've been in the industry  
14 now for twenty years and I can tell you during  
15 many times during that part of our career, some  
16 of our aspirational goals were to grow. We hope  
17 to grow, we hope to invest, and that's what we  
18 talked about. So my testimony today is really  
19 going to focus on two key points that we think  
20 are important. One, investment, and two,  
21 regulatory balance. So first, BNSF's investment  
22 has been unprecedented, and our customers have

1 responded by making their own investment of  
2 capital and volumes on our railroad. The current  
3 regulatory environment is generally working  
4 exactly as it should. We have a safe and  
5 reliable railroad that over time has been able to  
6 handle our customer's growth with improving  
7 operational efficiency. Second, the board must  
8 continue to strike the proper regulatory balance.  
9 We are very concerned with some of the proposals  
10 to adopt industry or commodity wide caps because  
11 we believe that will disrupt our business model  
12 which focuses on growth and investment.

13           However, we understand the board would  
14 have concerns about unlimited rate increases for  
15 certain shippers if and when railroads  
16 consistently earn revenues significantly in  
17 excess of a reasonable return. We believe the  
18 board should continue to address rates that are  
19 excessive through an individualized analysis. So  
20 I want to start by talking about investments, and  
21 up on the slide there you can see BNSF's business  
22 model. Frankly, it's focused on growing with our

1 customers. We will invest, if we're able to grow  
2 our business, improve our operational efficiency,  
3 and receive appropriate value for our services.

4 This enables us to earn appropriate returns,  
5 which creates an incentive for us to further  
6 expand and continue this virtuous investment  
7 cycle. BNSF has had a long history of investing  
8 to improve and expand our network to the benefit  
9 of our customers and the overall economy. Since  
10 2000, we have invested over fifty billion dollars  
11 in infrastructure and equipment. Since that  
12 time, we've replaced approximately forty-four  
13 million ties, over 11,000 miles of rail, and  
14 added more than thirty million tons of ballasts.

15 I did just want to pause here given  
16 the comments of the preceding panel. You know,  
17 one of the things that's important that I thought  
18 was overlooked, if you look at that blue line,  
19 that's growth. And when we talk about  
20 investment, that's why we've been investing a  
21 large portion of our funds. It's to help ensure  
22 we're able to be there as our customers are

1 growing. And Bystrum and Begeman, you correctly  
2 pointed out they arbitrarily picked 2005, which  
3 was one of the high points of car loads. The mix  
4 of business on a railroad has dramatically  
5 changed. A lot of our investment has gone into  
6 the northern corridor, which is where a lot of  
7 our newer volumes are moving now. And the last  
8 thing, they talked about service, and the fact  
9 that service isn't improving despite the  
10 investment we're making. The simple fact of the  
11 matter is when we look at our customer surveys  
12 across our broad base of customers, that's not  
13 what we hear. Over time, the marks we've gotten  
14 have improved. Now, I will say 2014 was a  
15 horrendous year and you certainly wouldn't have  
16 seen that from our customers, but prior to that  
17 time you saw consistent improving service marks.

18 With regard to adding new capacity,  
19 BNSF has added 536 miles of double and triple  
20 track, constructed 33 new passing sidings, and  
21 extended thirty-five sidings. These projects,  
22 along with targeted terminal expansion projects

1 and signal system upgrades have allowed BNSF to  
2 accommodate business growth on a continuing  
3 basis. As demonstrated by our plan to invest in  
4 industry records six billion dollars in 2015,  
5 following our record 5-1/2 billion dollar  
6 investment in 2014, we will reinvest in the  
7 business when we have a reasonable degree of  
8 certainty that will be able to achieve a  
9 reasonable return on our investment. Today, our  
10 2.9 billion dollar maintenance program is what  
11 our entire capital program was just ten years  
12 ago. Our customers are also investing in our  
13 future. My colleague, John Miller, appeared  
14 before the board last month in the grand  
15 proceeding. He talked about how BNSF's  
16 agricultural customers were responding to our  
17 level investment by making their own significant  
18 investments in BNSF served facilities. We  
19 believe that our customer's investments are  
20 indicative of their belief in our ability to  
21 provide excellent service over the long-term at  
22 market responsive rate levels. We see this kind

1 of investment from customers across all of our  
2 business units. Since 2000, we've increased the  
3 volume on our railroad by over 2.1 million units,  
4 and every year since 2010 our volumes have grown  
5 year over year.

6 The slide that's up now highlights our  
7 investments since 2010. Because of the  
8 anticipated growth of our customers, you've seen  
9 broad geographic investment across our entire  
10 network, this will benefit all of our customer's  
11 business. It is well known that most forecasts  
12 of future traffic trends so that there will be an  
13 ever increasing demand for rail services, and  
14 thus a need for additional rail infrastructure in  
15 the U.S. At BNSF we certainly believe demand for  
16 our services will continue to grow, and the  
17 strategic investments made by BNSF will enable us  
18 to meet this ever increasing demand for our  
19 services. But while our belief and our  
20 customer's future growth has driven us to invest,  
21 a critical factor allowing us to make these  
22 private sector investments is that we've had a

1 relatively stable economic regulatory environment  
2 that's been conducive to investment. I want to  
3 emphasize how important regulatory certainty is  
4 in our investment decisions. The principles  
5 embodied in the Staggers Act appropriately  
6 balance the needs of certain customers to access  
7 rate relief with the recognition that our  
8 industry must be permitted to earn revenue  
9 sufficient to justify reinvestment. Those  
10 principles have incubated the growth and  
11 investment we've experienced in the past decade  
12 and supported BNSF's model focused on growing  
13 with our customers.

14           The board is very familiar with the  
15 service deterioration experienced by BNSF  
16 customers at the end of 2014 and 2014 as a result  
17 of significant, unanticipated volume growth that  
18 exceeded available capacity in key areas of our  
19 network, combined with harsh winter operating  
20 conditions. The dramatic and persistent down  
21 turn in velocity across our network, in  
22 combination with growing volumes, left us with a

1 choice. Either we respond with investment to  
2 build the capacity that will restore and  
3 ultimately improve service for all our customers,  
4 or operate with insufficient capacity to serve  
5 all of our customers current, much less, their  
6 future demands. We chose to respond with massive  
7 investment, and that strategy is working. We've  
8 experienced notable performance improvements in  
9 all key measures.

10 As you can see in the attached slide,  
11 our overall train velocity, as measured in miles  
12 per hour, has improved by eleven percent since  
13 last summer. We have, in turn, seen a dramatic  
14 reduction in the average terminal dwell  
15 experienced on shipments moving across our  
16 system. Our customers have already begun to feel  
17 the positive impact of these investments in a  
18 form of improved service and increased  
19 reliability, but the benefit of these investments  
20 are not short-term. The investments we made in  
21 2014 and 2015 will benefit our customers and the  
22 U.S. supply chain for decades to come. However,

1 it is important for the board to understand that  
2 when we decided to make these large capital  
3 investments in 2014 and 2015 each individual  
4 project had to undergo a rigorous financial  
5 analysis. Will the projected returns justify  
6 making the investment? Unfortunately, when we  
7 perform these financial analyses, we don't have  
8 certainty into whether or not the estimates of  
9 future volumes, market conditions, and costs are  
10 accurate because of the long time horizon that  
11 requires they ultimately pay us back for these  
12 multi-million dollar projects. Many of our  
13 projects require decades to achieve a reasonable  
14 rate of return, and many of the markets we serve  
15 go through business cycles and are subject to  
16 disruption. The testimony I heard from the coal  
17 groups is a great example of long-term investment  
18 risks faced by BNSF.

19 A decade ago, when we began increasing  
20 our investment in our coal business no one could  
21 have predicted the down turn we are seeing now.  
22 Even as late as 2014, coal customers were

1 demanding that BNSF invest and add more capacity  
2 for coal. Yet, in the past year, BNSF has seen a  
3 structural change in the long-term outlook for  
4 our coal business. We expect that we will see a  
5 drop in these long-term investments. Coal is not  
6 the only market where we've seen the risk profile  
7 change. As we sit here today, it is already  
8 clear that many of those projects that we  
9 invested in during 2014 and 2015 will take longer  
10 than we anticipated to achieve a reasonable  
11 return. And there is no certainty that it will  
12 happen. That's frankly the challenge that we  
13 face when we make these long-term infrastructure  
14 decisions. When should I make it? Where should  
15 I make it? And can I count on the earnings to  
16 occur over a long period of time? Uncertainty  
17 about possible regulatory changes creates another  
18 layer of risk on top of those business risks I  
19 just described, and there is always a risk of  
20 regulatory processes such as environmental  
21 permitting causing unanticipated delays and  
22 getting those projects off the ground. As a

1 result, we have to make investment decisions  
2 based upon a risk adjusted threshold. The  
3 greater the risk the higher return we will  
4 require on the project. If the types of  
5 artificial rate caps now being proposed had been  
6 in place in 2013 and 2014, we simply would not  
7 have been able to respond to the service  
8 degradation that we experienced with the same  
9 level investment. We would have placed a higher  
10 degree of risk in our financial analysis, and  
11 that likely would have led to lower investment in  
12 those years.

13 It is important to note that despite  
14 being a subsidiary of Berkshire Hathaway, we are  
15 still subject to similar market forces to compete  
16 for capital. We must demonstrate our ability to  
17 generate returns and cash flows required to  
18 service our capital requirements. If we don't,  
19 our investors will find other alternatives for  
20 their capital. Keep in mind, our investors are  
21 not just Berkshire Hathaway. We also have  
22 investors in our public and private debt. Rating

1 agencies monitor BNSF's financial health,  
2 including cash flows and earnings relative to  
3 borrowing levels. If not managed properly, that  
4 can impact the cost of our debt, and ultimately  
5 our ability to find our investment. Therefore,  
6 BNSF's approach to our investment decision works  
7 exactly the way it did before the Berkshire  
8 Hathaway acquisition. Each capital projects,  
9 whether small or large, must undergo the same  
10 rigorous financial analysis. As I mentioned  
11 earlier, my team performs the analysis on all  
12 projects to ensure they provide for reasonable  
13 rate of return. Once complete, projects  
14 generally require approval by a cross-functional  
15 team of our executives. All of this ensures we  
16 make the best decision possible, given the facts  
17 and circumstances at that point in time.

18 In summary, I would just say every  
19 decision, whether or not we invest, is all about  
20 risk and returns. Because we are investing in  
21 long lived assets and spending is front end  
22 loaded, but the returns are earned over the life

1 of the asset, significant risk already exists  
2 when we invest in our infrastructure. As I  
3 mentioned earlier, one of the key aspects of our  
4 business model in this virtuous cycle of  
5 investment is ensuring we drive operational  
6 efficiencies. Operational efficiencies help us  
7 increase the value of our service to our  
8 customers and offset cost pressures and  
9 inflation. This has a significant impact on our  
10 ability to achieve reasonable returns. Each  
11 year, we analyze numerous investments geared  
12 toward generating operating savings out into the  
13 future. We assess those projects to ensure we  
14 will achieve a reasonable return on the capital  
15 spent. These type of projects are great for our  
16 customers, as they generally involve improving  
17 the fluidity and efficiency of our railroad.  
18 Another important aspect of incentivizing lower  
19 costs and innovation is it drives our suppliers  
20 to develop new and innovative products. As the  
21 railroad industry has grown, so have the  
22 resources and the capability of our supply base.

1 I see this firsthand today in my job the amount  
2 of innovation our supplier is doing is greater  
3 than it's ever been. Today, our suppliers  
4 understand we expect them to continually enhance  
5 their products to grow with us. As you can see  
6 from the slide, the number of rail equipment  
7 incidents and the reliability of our railroad has  
8 improved substantially in the last ten years.

9 The joint efforts of the railroad and rail supply  
10 industry to innovate has been a main driver of  
11 this improvement. From higher quality rail to  
12 railroad tie life extension, to improve methods  
13 to enhance the surfacing of our railroad to the  
14 massive technology that is being invested, all of  
15 it happens because we work together with our  
16 suppliers who drive improvement. Today's  
17 regulatory environment permits exactly the type  
18 of behavior the board and the railroad's  
19 customers would want to see from us. We  
20 constantly challenge ourselves, can we do better?

21 However, proposals that we have seen  
22 from participants in this proceeding represent

1 significant risks in our ability to continue the  
2 current level of investment. RBC based  
3 proposals, in particular, have very negative  
4 consequences that are contrary to the public  
5 interest and the interests of our customers, and  
6 have the unintended consequence of penalizing  
7 railroads who made efficiency investments. To  
8 conclude, I would like to take us back simply to  
9 our core message today about investment and  
10 regulatory balance. BNSF has heard the  
11 complaints from some shippers about their  
12 inability to access the board's existing rate  
13 review procedures and would support efforts to  
14 address those concerns. But BNSF strongly  
15 opposes the adoption of any company-wide or  
16 commodity wide cap on returns like those that  
17 have been proposed by several commenters in this  
18 proceeding. BNSF understands that the board  
19 might be concerned about the highest of the high  
20 rates charged by a revenue adequate carrier to  
21 certain shippers, but the board should not  
22 overreact with regulations through firm wide

1 constraints or rate caps. Those rates should  
2 continue to be addressed through an  
3 individualized analysis that does not disrupt the  
4 important regulatory balance that currently  
5 exists.

6 I will end by reiterating BNSF's  
7 business model is focused on growing with our  
8 customers. We have made unprecedented  
9 investments that have allowed us to grow and  
10 improve our service and efficiency. Our  
11 customers have responded with our own investments  
12 and increasing volumes on our network. This  
13 investment cycle is precisely what board policy  
14 should continue to encourage going forward.  
15 That's the end of my testimony and when we have  
16 questions Jill Mulligan will assist me.

17 MS. RINN: Jill, could you pass the  
18 clicker down please? Good afternoon, I'm Lou Ann  
19 Rinn, and we are very pleased, Union Pacific, to  
20 have the opportunity to address the very  
21 interesting and compelling topics that are the  
22 subject of this hearing. I am particularly

1 pleased to be able to introduce our two  
2 witnesses. The first is Professor Kevin Murphy,  
3 who is a professor of economics for the  
4 University of Chicago, and also affiliated with  
5 Charles River Associates. It's been a long two  
6 days, so I am not going to try to reprise his  
7 very extensive qualifications and credentials.  
8 I'll take a little bit longer, however, to  
9 introduce my colleague, John Panzer. John Panzer  
10 and I first began working with each other when we  
11 were investor relations together. He went on to  
12 other responsibilities in the finance department  
13 and then spent over a decade in interrole  
14 marketing and chemical marketing before returning  
15 to finance recently to take over as vice  
16 president of planning and analysis. John is  
17 going to discuss how Union Pacific addresses or  
18 deals with how we make investment decisions, and  
19 what the implications are for the issues that you  
20 are dealing with here. Professor Murphy is going  
21 to take a step back and look at some of the  
22 broader policy issues and address some of the

1 questions that you've been raising over the last  
2 two days. John?

3 MR. PANZER: Thank you, Lou Ann, and  
4 thank you for the opportunity to speak to you  
5 today. My responsibilities at Union Pacific  
6 include capital budgeting, which involves  
7 analyzing potential capital projects and  
8 determining which ones get funded and which ones  
9 do not. I understand that the board is  
10 considering proposals to impose new constraints  
11 on rail rates and revenues once railroads achieve  
12 so called revenue adequacy. If adopted, such  
13 proposals would impact our capital spending  
14 decisions and force us to reduce our capital  
15 investment, especially in projects involving new  
16 capacity. In my remarks, I'll describe Union  
17 Pacific's capital budgeting process and how  
18 demand for capital spending has changed over  
19 time. Then I'll explain how the types of rate  
20 constraints being considered by the board would  
21 affect our analysis of projects and force us to  
22 reduce investment. At Union Pacific, my team

1 analyzes proposed capital investments using the  
2 same valuation in capital budgeting techniques  
3 that are very common in those corporations.  
4 We're presented with a proposed project, we  
5 calculate the expected return on investment, or  
6 ROI, which is based on the size and timing of  
7 future expected financial benefits. We then  
8 consider where the ROI is sufficiently high to  
9 justify making the investment. The forward  
10 looking analysis we use in evaluating ROI's, and  
11 whether to make investments is very different  
12 from the backward looking historical analysis  
13 that the board uses in its annual revenue  
14 adequacy calculations. The board is measuring  
15 the rate of return generated by all existing  
16 assets in our entire enterprise, and we call that  
17 return on invest to capital, or ROIC, but it's a  
18 measure of past performance. New assets are  
19 added to our total investment base through our  
20 capital spending program to ensure that our ROIC  
21 remains above our cost to capital we have to  
22 ensure that each new investment that we make

1 generates an ROI that at least achieves our cost  
2 of capital. And at this point, I want to make a  
3 comment because it was discussed extensively the  
4 last couple of days about deferred taxes.

5           Deferred taxes are an outcome of what  
6 we call bonus depreciation, which is rules  
7 established by the IRS that encourages company to  
8 spend money or invest today by giving them tax  
9 benefits on those investments that occur sooner  
10 than they would otherwise. And that effect of  
11 all that is for bonus depreciation to increase  
12 the expected returns on projects and so by  
13 excluding deferred taxes from the ROIC  
14 calculation the board is effectively eliminating  
15 or reducing that incentive as created by the IRS  
16 to make near term investments. The distinction  
17 between the forward looking ROI and backward  
18 looking ROIC calculations is important to  
19 understand. In fact, it answers the question  
20 about how the railroads have been able to invest  
21 in projects, even before they became revenue  
22 adequate. And that's because future investments

1 are all based upon forward looking economics, not  
2 backward looking. Since ROIC is measured by the  
3 board as backward looking, it really provides no  
4 useful information about the prospects for  
5 earning a good return on future investments. And  
6 this difference helps explain why the board  
7 focusing on what is called revenue adequacy could  
8 depress returns on future capital investments and  
9 reduce the railroad's opportunity to meet  
10 customer's needs for capacity and service.  
11 Union Pacific generally classifies capital  
12 investments as either replacement or growth.  
13 Replacement capital projects are investments to  
14 replace worn or retired assets that continue to  
15 be needed for operation of the railroad. These  
16 projects carry relatively low risk because  
17 they're intended to allow us to continue to  
18 handle established traffic. Growth capital  
19 projects are investments to enable the railroad  
20 to grow the volume of business we handle, improve  
21 service for our customers, or increase  
22 efficiency. Most of my team's efforts are

1 dedicated to analyzing growth investments. These  
2 projects require more scrutiny because they're  
3 often associated with new sources of revenue or  
4 significant operating changes. This makes them  
5 inherently more risky than replacement projects  
6 and the potential future benefits are more  
7 difficult to analyze. To the extent that we have  
8 funds available to make investments, but there  
9 are not enough projects that will deliver  
10 adequate returns, our shareholders expect us to  
11 return cash back to them through dividends or  
12 shared buybacks. This allows them to invest in  
13 other activities that have greater prospects of  
14 generating higher market based returns. Union  
15 Pacific is experiencing high demand for  
16 investment and growth capital. In my job, the  
17 challenge is ensuring opportunities for growth,  
18 result in benefits that are sufficient to provide  
19 a return on those investments.

20 In the years following deregulation of  
21 the railroad industry, relatively few growth  
22 capital projects were undertaken. Railroads were

1 forced, instead, on increasing productivity by  
2 rationalizing their networks and eliminating  
3 unprofitable line segments. The need for growth  
4 capital increased following the UPSP merger, as  
5 we undertook new construction projects to connect  
6 the two railroads, and to support the then  
7 growing demand for powder river basin coal.  
8 Spending on growth capital then slowed until the  
9 mid-2000's, when rising demand supported  
10 increased rates, helping generate a level of  
11 expected returns that justified additional  
12 expenditures and growth capital. Since 2003,  
13 Union Pacific has spent over six billion dollars  
14 on growth projects such as adding new track,  
15 yard, and ramp capacity. I'll mention while our  
16 total volume since 2005 have not grown, our  
17 service has improved dramatically, and also the  
18 demand on our network has shifted. It started in  
19 the early 2000's to be more Midwest oriented, to  
20 support coal growth, and then more westerly to  
21 support intermodal, and now we're seeing  
22 increased demands in the southern part of our

1 railroad to support energy and chemical markets.

2 So the capacity has been added, it's just the

3 demand across the river has shifted.

4           But with these opportunities come  
5 challenges. The cost of adding capacity in our  
6 system is rising, we've constructed sightings,  
7 crossovers, and connections where they've had the  
8 biggest impact on through put, but to make  
9 equivalent impacts in the future we'll have to  
10 make even more extensive investments, like adding  
11 miles of double track. Investment requirements  
12 are also increasing because demand is rising in  
13 congested areas. For example, in Texas and  
14 Louisiana we face high land acquisition costs and  
15 other factors that make construction more  
16 challenging, including moving a large number of  
17 pipelines and dealing with environmental and  
18 permitting challenges. The challenge isn't  
19 finding investment and opportunities, but finding  
20 projects that generate sufficient return to  
21 justify these increasingly costly investments.  
22 The new rate constraints proposed in this

1 proceeding would increase the challenge in  
2 finding projects whose ROI would justify the  
3 investment. Such constraints with reduced  
4 capital expenditures in our rail network by  
5 reducing the number of projects that deliver  
6 adequate returns. As I've explained, when we're  
7 deciding whether to fund a project, the question  
8 isn't whether we have a particular system wide  
9 ROIC, however you measure it. The question is  
10 whether the project is expected to deliver  
11 sufficiently higher returns when looking only at  
12 the future investments that that project would  
13 generate.

14           When we invest in growing our network,  
15 we expect the investments will help us handle  
16 traffic, a sufficient level of profitability to  
17 make the investments worthwhile. If rates are  
18 subject to new constraints based on concepts of  
19 revenue of adequacy, fewer projects will produce  
20 sufficiently higher returns, and fewer projects  
21 will be funded. Again, this has nothing to do  
22 with our historical overall level of return or

1 our ability to access capital. It is probably  
2 easier to see how this is true for projects that  
3 would directly benefit traffic that is subject to  
4 rate regulation. For example, an investment that  
5 primarily benefits an exclusively served chemical  
6 facility might not be undertaken if rates were  
7 capped under revenue adequacy constraint and our  
8 expected return is too low to justify in the  
9 investment. But as I understand the proposals  
10 before the board, application of a revenue  
11 adequacy constraint would also reduce our  
12 investments in projects that would directly  
13 benefit exempt commodities or business under  
14 contract. If earnings from those investments are  
15 used to provide refunds or trigger rate caps for  
16 other traffic, then that regulatory tax would  
17 reduce our expected returns, and inevitably we  
18 would be left with fewer projects.

19 Most investment opportunities involve  
20 circumstances somewhere in between my two  
21 examples. They would directly benefit some  
22 traffic subject to regulation, and some that is

1 not. But in every case, the type of new  
2 constraints that are being proposed would reduce  
3 expected future benefits, and therefore force us  
4 to reduce investment. And even when we invest,  
5 the types of constraints being discussed could  
6 distort those decisions. If one project with  
7 otherwise high returns faces greater regulatory  
8 risk, then that project may not be undertaken in  
9 favor of another project with lower returns, but  
10 lower risk. In other words, new constraints  
11 would change the flow of capital dollars by  
12 overriding market signals. In summary, we  
13 believe that continued capital investment is  
14 critical to meeting the ever changing demand for  
15 rail service. Our capital spending increased  
16 substantially in the past decade in response to  
17 shippers demand for new capacity and improved  
18 service. But sustained high levels of investment  
19 are only possible if expected returns are  
20 sufficiently high to drive dollars back into our  
21 network. The types of new constraints being  
22 discussed in this proceeding are especially

1       troubling because they are focused on historical  
2       returns which have nothing to do with the forward  
3       looking analysis that we use to make investment  
4       decisions.

5                   Use of the concept of overall revenue  
6       adequacy would interfere with market signals that  
7       identify what would otherwise be sound  
8       investments. Interfering with the free flow of  
9       capital to the best projects will distort  
10      investment decisions and inevitably reduce  
11      capital investment in our network. Thank you for  
12      your attention.

13                   MR. MURPHY: Okay, sorry about that,  
14      I saw the light wasn't on, so I guess the light  
15      just doesn't work. Anyway, well, thank you very  
16      much for having me here today. It's really a  
17      pleasure to have the opportunity to talk. I'm  
18      going to try to go through much of what was in my  
19      written work, but also try to tailor it around  
20      answering some of the questions that have come up  
21      over the last few days. And if there are any  
22      additional questions or further clarification I'd

1 be happy to answer those after I'm done. Anyway,  
2 one of the things we've heard a lot about is,  
3 well, the railroads have had a lot of big  
4 improvement in their performance, haven't they?  
5 Don't they have plenty of money to make the  
6 investments that are needed? And I think it's  
7 important to do a couple of things. One is think  
8 about a little history and how we got here, and  
9 also to go back and review the underlying  
10 economics of investment, much of which John just  
11 talked about. So in terms of the history, the  
12 largest historical improvement for railroads came  
13 from rationalization of the network and improved  
14 operations that came after the Staggers Act in  
15 partial deregulation. Over time, excess capacity  
16 has been reduced, and many of the bottlenecks  
17 have been removed. This has led to higher  
18 productivity and lower rates to shippers. That's  
19 a history you're well familiar with.

20           However, there's a flip side to this.  
21 This has left the railroad industry in a  
22 situation where further progress cannot be

1       obtained simply by rationalizing what we have.  
2       Further progress requires that we make even  
3       larger investments going forward. That's, I  
4       think, what John just talked about here. And I  
5       have a chart that kind of illustrates that. This  
6       chart looks at the amount of expenditure per  
7       track mile over time for UP's network. And I  
8       think what you can see is that the amount of  
9       investment, the intensity of investment is much  
10      higher today because we're not just taking a  
11      network that had a lot of excess capacity and  
12      rationalizing it. In order to meet the ever  
13      changing nature of demand today, you have to  
14      build new things. You have to add new capacity  
15      in different places. And it's important to  
16      remember it's not just about total carloads. I  
17      think this came up earlier. When demand shifts,  
18      when we switch from Western Coal to Shell gas,  
19      that requires additional investment because they  
20      don't reutilize the exact same assets that were  
21      used before. And so you have to take this into  
22      account. So, you know, the fact that railroads

1 are revenue adequate doesn't mean that investment  
2 is insensitive to what you do, that somehow  
3 well, they're making enough money, returns are  
4 high enough, that's not a concern we have to  
5 have, okay?

6 So I'm going to go ahead. Another key  
7 point is that the improvement over time and  
8 investment is not just about meeting a specific  
9 customer's needs. One of the things that happens  
10 through investment is you're able to improve the  
11 overall efficiency of the network, make the  
12 network run better. And the charts I've put up  
13 here on the left actually measure two service  
14 quality metrics. One is slow order miles and  
15 slow order delay hours on the left, and how  
16 they've changed over time, and you can see that  
17 while they did take up in 2014, that followed a  
18 prolonged period of improvement in the slow order  
19 miles on the UP network. The one on the right is  
20 the customer satisfaction index. Again, I think  
21 that other railroads have referred to some of  
22 these same things. Again, those show

1 improvements. And what this means, and you have  
2 to remember, railroads are a network industry.  
3 So if you fail to make investments in one part of  
4 the network, or for one shipper, often that will  
5 spill over to affect other traffic. And that's  
6 an important thing to keep in mind. It's not,  
7 you know, that don't intend to have pretty broad  
8 effects on the networks.

9 So it's not about, when you think about  
10 investment, another important thing to remember,  
11 it's not about whether the railroad has the  
12 money. It's as John said, look at that's now how  
13 they make the investment. They don't say, god,  
14 we've got enough cash, let's make the investment.  
15 They look at it, what's the return? Is the  
16 return there? So when you think about  
17 regulations you want to think how was regulations  
18 going to affect the return in the allocation of  
19 investments? So that leads me to a second  
20 question. You've heard a lot from the railroads  
21 over the last couple days that many of the  
22 shipper proposals amount to some broad based rate

1 of return regulation, and you've heard other  
2 arguments to the contrary. And you also heard  
3 the fact, and this is a question I think was  
4 raised yesterday is, well, isn't this a small  
5 segment of the marketplace, and therefore not  
6 such as big of a concern as it might otherwise  
7 be? That is, is this regulated traffic very  
8 small? And the question you have is, well, which  
9 is the right way to think about it? Well, the  
10 key thing to remember about rate of return  
11 regulation, it's most pernicious effects come  
12 because you're monitoring the returns. You've  
13 now changed the company's incentives to not  
14 what's best for their business, but what fits  
15 best with the regulatory environment. That is,  
16 they tend to invest in things that are measured  
17 or even over measured in the measurement of  
18 returns, and they under invest in things that  
19 don't count. If you start linking things too  
20 tightly to RVC ratios, well, there's two parts of  
21 the RVC ratio, there's the cost and there's the  
22 revenue, and one way to make sure your RVC ratios

1 aren't too high is to make sure your costs are  
2 higher. Again, you've got to be careful about  
3 the incentives that are induced.

4 And the thing about a revenue adequacy based  
5 constraint, whether it's something that  
6 explicitly looks at the surplus over revenue  
7 adequacy, or something that's triggered by  
8 revenue adequacy is that revenue adequacy is a  
9 company-wide measure. And therefore, if you link  
10 something, you do something, you'll be regulated  
11 more heavily, you'll be subject to price caps,  
12 whatever it is, and you say that's linked to the  
13 attainment of revenue adequacy. That company's  
14 going to have an incentive to try to avoid  
15 revenue adequacy. And you can avoid revenue  
16 adequacy not just by changing what you do on  
17 captive traffic, but changing what you do on any  
18 traffic in your network, because that's how  
19 you're measuring revenue adequacy. And to me,  
20 that raises this issue. It says I've got this  
21 small segment, maybe it's five percent, maybe  
22 it's twenty percent, whatever you want to say it

1 is, I'm worried about that, but I'm going to link  
2 it up to this broad measure of revenue adequacy,  
3 and all those well documented and well understood  
4 adverse effects of rate of return regulation that  
5 have been, you know, we've seen them in other  
6 industries, they're well established in the  
7 economic literature, are then going to be present  
8 across the system, not just on the regulated  
9 fraction of the traffic.

10 Secondly, you have to take account of the fact  
11 that the regulated part of the traffic is not a  
12 constant. That is, there's going to be incentive  
13 effects. That is, more and more people, you make  
14 it attractive to be under the regulatory regime.  
15 More and more people are going to go there. So  
16 maybe it's five percent at one measure, it won't  
17 stay at five percent if you change the picture.

18 Let me make sure that covered what I wanted to  
19 say here. It's also important to remember that  
20 the impact of regulation is not about whether we  
21 will drive railroads below revenue adequacy, and  
22 that's an important point. That is, it's not

1 like there's revenue adequacy and then revenues  
2 above that are kind of this extra that really  
3 aren't needed to support investment. That's just  
4 not the right way to think about it. Think about  
5 what John talked about a minute ago, or what was  
6 brought up yesterday in Dr. Brenner's testimony.  
7 The way a company does its capital investment  
8 decisions is they have a hurdle rate. Let's just  
9 say it's eleven percent, just because that's what  
10 Dr. Brenner used yesterday. I'm going to stick  
11 with the eleven percent. You have eleven percent  
12 hurdle rate, you have an investment that has a  
13 return of thirteen percent, you'll do it. If you  
14 make changes to the regulations by taxing the  
15 returns implicitly through revenue adequacy  
16 constraint or lowering the rates that you can  
17 charge, then the shipper is served by that, and  
18 that falls to ten percent, that company will no  
19 longer make that investment.

20 That will be true even if the overall  
21 average return is still above revenue adequacy.  
22 That is, you will still lose investments, even

1       though overall you're above revenue adequacy.  
2       That's not how pros think about it. They don't  
3       say on average are we covering it? They ask for  
4       this project are we covering it, so you have to  
5       worry about that side of it as well. And I think  
6       that's an important thing to keep in mind when  
7       you think about the investments that, and the  
8       potential effect on investments. It's not about,  
9       well, they'll still be revenue adequate, we're  
10      not going to take it all away, so they'll still  
11      be above. That doesn't tell you you're not  
12      affecting investment. In fact, you will be  
13      affecting investment as long as you affect the  
14      returns on individual projects.

15                Again, the other side is, well, don't  
16      they have plenty of money they're paying out to  
17      shareholders? But, again, it's not in a health,  
18      well run business, investment is not determined  
19      by how much money you have, it's determined by  
20      the return on the investments you're examining.  
21      And so the fact that there's "plenty of money"  
22      doesn't mean you're not going to affect

1 investments. I think, now one thing you might  
2 ask yourself is, well, geez, you know, we heard a  
3 lot about SAC. People talked about SAC  
4 yesterday, talked about SAC today, and I think  
5 there's no question that the SAC process needs to  
6 be improved in some ways. I mean, it's a  
7 difficult process, it's a costly process. And  
8 the question is, well, aren't these other  
9 alternatives, aren't they a substitute for SAC?  
10 Aren't they an alternative way of doing what SAC  
11 tries to do? And in many ways these proposals  
12 aren't really a substitute for SAC, and I'll try  
13 to go through them and explain why.

14 First of all, SAC has two key economic  
15 features to it. First, it asked about, it tries  
16 to look at competition. What rates would  
17 competition generate? And in particular, it says  
18 if this were, if there were no barriers to entry,  
19 this was a contestable marketplace where anybody  
20 could come in and compete for the business by  
21 building the capacity, what would prices have to  
22 be? What would be a constraint on prices?

1 That's the nature of the SAC test. It's about a  
2 competitive stand. And one thing we've learned  
3 in economics is that competition of that type,  
4 real world type competition, that is competition  
5 that is focused on what would private  
6 enterprises, what would private individuals want  
7 to do is a great benchmark because it gets us  
8 away from kind of the tinkering that comes in  
9 when you try to be a social planner and decide,  
10 well, what would be a better thing to do than  
11 what a market would generate. Those are very,  
12 very difficult questions to ask. The second  
13 thing is SAC focuses on the rates being paid by  
14 an individual shipper. They ask is that shipper  
15 paying more or less than what would be that  
16 competitive benchmark?

17 Now, proposals that simply say to get  
18 a benefit, you just need to do two things. You  
19 need the railroad to be revenue adequate, and you  
20 need to be established market dominance, cut out  
21 both of those things. They don't ask about what  
22 the competitive price would be, they don't ask

1       whether your rates are above or below the  
2       competitive levels. And therefore, they're not  
3       really substitutes because they're not trying to  
4       establish the same results. Now, you might say,  
5       well, aren't they a close approximation? Isn't  
6       it really probably an okay assumption? Well,  
7       there's two implicit assumptions in those  
8       approaches. One is the achievement of revenue  
9       adequacy and the fact that railroads are revenue  
10      adequate tells us that somehow they've collected  
11      too much from the captive shippers. And  
12      secondly, that in so, let's think about that one  
13      first. So the fact is, well, what does the data  
14      say? Well, the data says that in fact, over  
15      time, and this is what we've talked about before,  
16      the biggest growth has actually been if you look  
17      at margins, the biggest growth in margins was  
18      actually on the exempt traffic. Much bigger than  
19      it was on the non-exempt traffic. So the fact  
20      that railroads have become as measured by the  
21      board, revenue adequate doesn't really tell you  
22      that there's been an overcharge to an individual

1 potentially captive shipper, or even to them as a  
2 group, and that's exacerbated by the fact that  
3 the vast volume of traffic and the vast amount of  
4 dollars is actually from those exempt and  
5 otherwise presumed competitive categories of  
6 business.

7           Secondly, if you look at the  
8 distribution of, for example, just RVC ratios,  
9 there's enormous overlap between the presumed  
10 competitive traffic and the competitive traffic  
11 or exempt traffic, and the what you might call  
12 potentially captive traffic. There's enormous  
13 overlap between those two things, which isn't  
14 that surprising, but what it means is  
15 establishing that you're somehow potentially  
16 market dominant isn't enough to say by in itself  
17 you're paying too high a rate. It's not a very  
18 close correlation between the two. Now, one set  
19 of proposals that tries to look at individual  
20 rates are the comparables approach. And that was  
21 what was talked about in the TRB paper. In  
22 principle, the comparable's approach is something

1 you could look at, and in fact, I have experience  
2 in other industries that use the comparables  
3 approach. And one thing I'll tell you based on  
4 that, it's not without its own sets of disputes  
5 and battles, and the battles get messy and it's  
6 not like oh, good, we just get from here and  
7 there's the answer, and guess what, we're done.  
8 It's not, doesn't tend to work that way. There's  
9 a lot of problems.

10 Secondly, when you think about it applied to this  
11 industry, there's some particular issues. One is  
12 the fact that you don't have competition means  
13 you're probably not in some fundamental sense  
14 comparably situated. That is, there's a reason  
15 why you're in a different market structure. You  
16 have a different cost to serve, you have  
17 different alternatives. There's just so many  
18 differences out there. Well, then the answer is  
19 well, can't I correct for those things? Well,  
20 but once you start correcting for those things,  
21 like, Professor Kalt said yesterday, you're sort  
22 of pushing yourself back in the SAC direction of

1 oh, I've got to take account of this additional  
2 cost because it's a low density market and I've  
3 got to take account of this additional cost for  
4 another reason, that really gets you back into  
5 almost the SAC type analysis and you've saved  
6 much less than you thought.

7 Secondly, and I think this also came  
8 up yesterday, and I want to reiterate it. There  
9 are incentive effects that come about when you  
10 have comparable regulation. In particular, if  
11 I'm a railroad and I'm asking do I want to give a  
12 low rate to this guy over here, oh, you better be  
13 careful if that's going to turn out to be the  
14 comparable that drives the rates that everybody  
15 else looks like they're going to try to get. So  
16 you've got to worry about that. Finally, and  
17 second to last thing I'd like to talk about, and  
18 this came up yesterday, is this question about  
19 replacement costs. First, I think there's a fair  
20 amount of confusion that's, and I don't think  
21 it's your fault, I think it's just everybody's  
22 talking about different things, and I think it's

1 led to some confusion. What do we mean by  
2 replacement costs? Take the example of a ten-  
3 year old locomotive. Moving to replacement cost  
4 doesn't mean substituting a brand new locomotive  
5 for a ten-year-old locomotive. It means valuing  
6 the ten-year-old locomotive at what it would be  
7 worth today. That's the opportunity cost of the  
8 asset if you think like an economist. That's  
9 what's really the amount that people have  
10 invested. It's what it's worth today, what those  
11 assets sell for in the marketplace today.  
12 Now, the second critique is that it's really hard  
13 to do. Okay, I'll just, can I have a couple  
14 minutes.

15 MR. ELLIOTT: Go ahead.

16 MR. MURPHY: It's really hard to do  
17 and the answer is depends on how you do it. If  
18 you do, there's an easy way to do it, a fairly  
19 straightforward way to do it and one is what you  
20 do is you do the same thing you do for historical  
21 cost calculations, it's just when you take those  
22 fast investments, the investment that happened

1 ten years ago, you bring it up to current value  
2 using a price index, so what would that same  
3 investment cost today? So how much would it cost  
4 and then depreciate it back reflecting its age.  
5 That will give you today's value of a ten-year-  
6 old locomotive, for example. So it doesn't  
7 inquire additional data beyond what you need to  
8 go in, other than the prices. Other than the  
9 price index, that's all you need. So if you have  
10 your assets divided by categories you can  
11 construct it, and Dr. Brenner kind of described  
12 that. It was also a discussion about well, geez,  
13 once you do that don't you have to use a real  
14 rate of return? And the answer again is no. The  
15 way you have to do it is just adjust the  
16 depreciation to reflect real depreciation as  
17 opposed to the nominal depreciation used in the  
18 original calculation. Once again, that's not a  
19 separate calculation. Once you've constructed  
20 the capital stack series you have the implied  
21 depreciation, just automatically, so you can  
22 correct the numerator in a way that's going to

1 actually generate a nominal return that can be  
2 then compared to the nominal return on capital.  
3 So it doesn't necessitate a whole new exercise to  
4 estimate real returns. I can put this together  
5 for you and describe all that if you're  
6 interested.

7 So finally, where does this leave us?

8 Well, I think it leaves us at a point that I  
9 would say it is important. You can't say that  
10 revenue adequacy is eliminating concerns over  
11 investment, using revenue adequacy as a trigger  
12 or as an element of a rebate or CAP program, is  
13 going to extend the adverse effects of rate of  
14 return type regulation across the company, and  
15 because of the fact that people make decisions on  
16 a project by project basis, you're going to  
17 affect investment even if overall the railroads  
18 remain revenue adequate. Thank you.

19 MR. ELLIOTT: Just to follow up on  
20 your replacement cost example, is that similar to  
21 the method that Department of Commerce uses that  
22 was being described yesterday in the testimony?

1 MR. MURPHY: That's essentially what  
2 they do.

3 MR. ELLIOTT: Okay.

4 MR. MURPHY: They're basically valuing  
5 past investments, they're getting the real value  
6 of past investments and depreciating those rather  
7 than a nominal value of past investments and  
8 depreciating those. And then that gives you your  
9 replacement capital stock today, and then the  
10 amount of depreciation that you've accumulated in  
11 there tells you how much depreciation to put into  
12 today to measure today's net return, net  
13 depreciation. And that can be compared to a  
14 nominal rate of return.

15 MR. ELLIOTT: Thanks.

16 MS. BEGEMAN: I thought his testimony  
17 was very complete.

18 MR. ELLIOTT: I have no further  
19 questions, so thank you very much. That was a  
20 very interesting testimony.

21 MS. MILLER: You guys got off easy.

22 MR. ELLIOTT: Why don't we bring up

1 the final panel, panel number five?

2 MR. MACDOUGALL: I hope there's no  
3 fire drill this time. I'm here on behalf of  
4 Samuel J. Nasca, who is the New York State  
5 legislative director for Smart, and he filed a  
6 statement on November 4th of last year, it's four  
7 pages, and I'm not going to repeat it. The main  
8 thing that the union is concerned about is the  
9 differential pricing. Also, I might say that  
10 whenever there's a congressional problem  
11 involving labor and management situations or a  
12 presidential review board, the issue of railroad  
13 adequacy always comes up. Can the railroads pay  
14 for what they're asking for? So there is an  
15 interest in the subject. I thought I might  
16 contribute to this by explaining, because I  
17 haven't heard it here, what the actual situation  
18 was and is now with respect to the way revenue  
19 adequacy is administered. It is, we all have a  
20 book, we got those out of what practitioners call  
21 reasonable freight rates, and I suggest it's a  
22 good handbook to have. It's the type of things

1 that ordinary practitioners, people from Montana  
2 have, I see you would get educated by it, and  
3 there's a section in there on how revenue  
4 adequacy is dealt with. And generally, it's just  
5 a policy situation. It is not something where,  
6 in fact, a general rule is that financial  
7 condition of the railroads is of little probative  
8 value in determining rate reasonableness.

9 There's an exception, and the exception is  
10 called, and even that is in reference to the  
11 entire system of railroads in a particular coal  
12 field. And it is not to be used in particular  
13 line segment reasonableness. And this is what  
14 it's been for years and years, and the book has  
15 about twenty cases in it. If you want to look at  
16 it you can see the way it's been administered.

17 And in the past, when the railroads were in  
18 trouble we had Ex Parte increases. And this  
19 agency or the old ICC put out a publication, one  
20 hundred pages, showing all the general rate  
21 increase adjustments since Lewis Brandize back in  
22 1914, all the way up to Ex Parte 267 in 1971.

1 And there's a date that is a page reference to  
2 the ICC reports, and even the tariff  
3 publications. And there were rate decreases, but  
4 they're always on a general basis. But for  
5 individual rates, the condition of the railroad  
6 because it's just not relevant. It's a policy  
7 directive. That's all. And it's worked for  
8 many, many years, and I suggest that they take a  
9 look at it, and I just don't think there is a  
10 policy to adopt a policy to get a used revenue  
11 adequacy in individual point to point rate  
12 adjustments. It has to be for the whole system  
13 or for the whole region, and involving more than  
14 one railroad.

15 The other quick subject I'd like to  
16 mention is what happened on June 10, and Ex Parte  
17 665 said one that was your great transportation,  
18 having all of a sudden we woke up and we came in  
19 and there is the TRB report, unannounced,  
20 presented, given all kinds of press releases to  
21 the public, and we've never had an opportunity to  
22 go into it. We've never had a hearing on it, but

1 it was actually this agency and its predecessor  
2 that caused the TRB report. And, in fact,  
3 initially we had Ex Parte 658, ten years ago, and  
4 Board Member Melvin gave six speeches on it.  
5 We've got to have a proceeding that's suggestive  
6 that the TRB should consider proceeding with this  
7 prior congressional experience.

8 He asked for a request of 1.8 million  
9 dollars to hire these professors to go and do a  
10 study, basically, of the Staggers Act, but they  
11 didn't turn out to be the Staggers Act because  
12 it's a general, I guess we all know what happened  
13 and came out. And a number of us filed comments  
14 in Ex Parte 658 questioning whether this was just  
15 going to be another executive branch attack on  
16 the STB. And that the government also did that  
17 when the ICC existed. There was a rivalry  
18 between one branch of government and the other  
19 branch of government, and they felt that the ICC  
20 was wrong and the current DOT felt the STB is  
21 wrong and the professors always think it's wrong.  
22 And the now retired vice president of the UTU

1 said this in a statement. His name is John  
2 Fitzgerald, which we filed in Ex Parte 658. It's  
3 only about five pages, and we predicted what had  
4 happened. All of a sudden we got hit with a big  
5 thing, not on grain transportation, but a big  
6 attack and I'm having a whole new system of  
7 giving wayward revenue accuracy, in fact,  
8 criticizing the STB's handling of rates. So I  
9 think it's an order you might want to think to  
10 allow comments on that TRB study, which is really  
11 a DOT finance study because it's come up in a  
12 number of your Ex Parte cases, including this  
13 one, and these economists don't have the last  
14 word, and I think they should be, we should have  
15 a hearing on that, or at least an opportunity to  
16 file comments on it because you people, Mr.  
17 Mulvey and also Chairman Norberg gave one talk  
18 saying let's have TRB, you know, give a study,  
19 give us some money. So you were really the  
20 major, in fact, Mulvey was a major force in  
21 getting that budget, 1.8 million dollars to study  
22 the Staggers Act. Thank you.

1                   MR. ELLIOTT: Thank you very much.  
2 All right, thank you, Mr. MacDougall, and thank  
3 you everyone for coming, for your testimony.  
4 Thank you staff for all your efforts to make this  
5 a successful hearing, and the hearing is now  
6 adjourned. Thank you.

7                   (Whereupon, the above-entitled matter  
8 went off the record at 3:27 p.m.)

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C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Railroad Revenue Adequacy

Before: Surface Transportation Board

Date: 07-23-15

Place: Washington, DC

was duly recorded and accurately transcribed under  
my direction; further, that said transcript is a  
true and accurate record of the proceedings.



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Court Reporter

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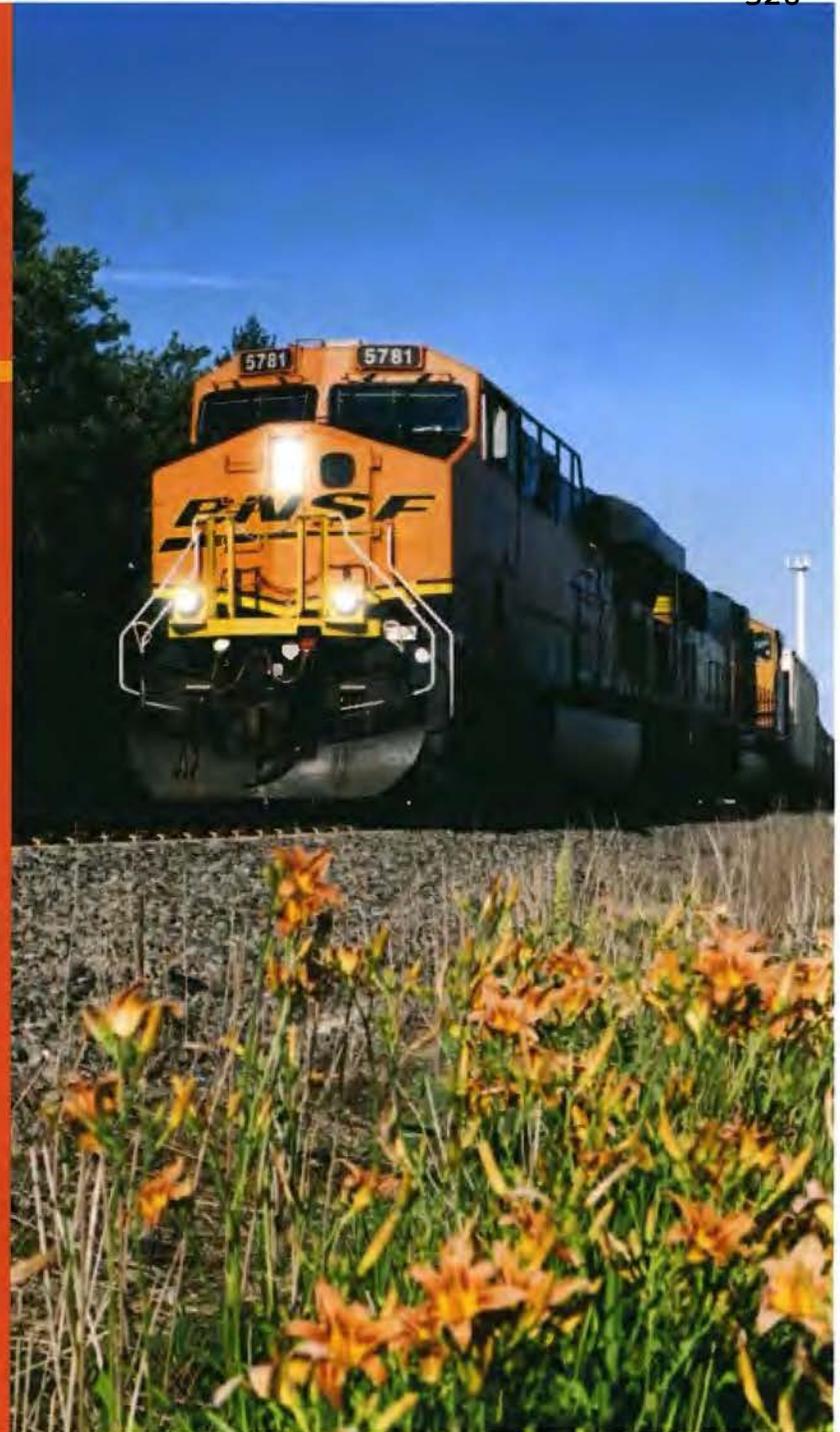
# *BNSF Railway*

Docket No. EP 722  
*Railroad Revenue Adequacy*

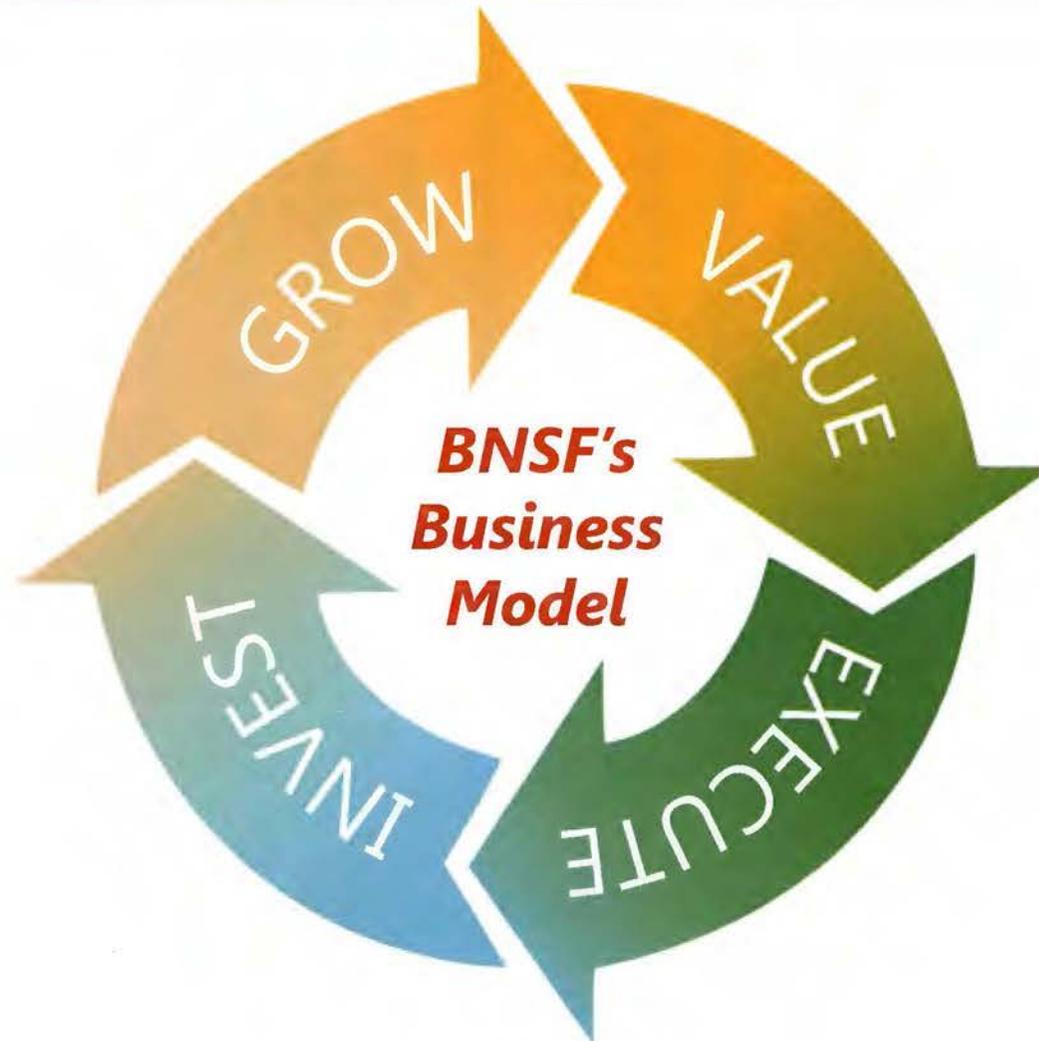
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*WCTL Petition – Cost of Capital*

July 22-23, 2015

**BNSF**  
RAILWAY

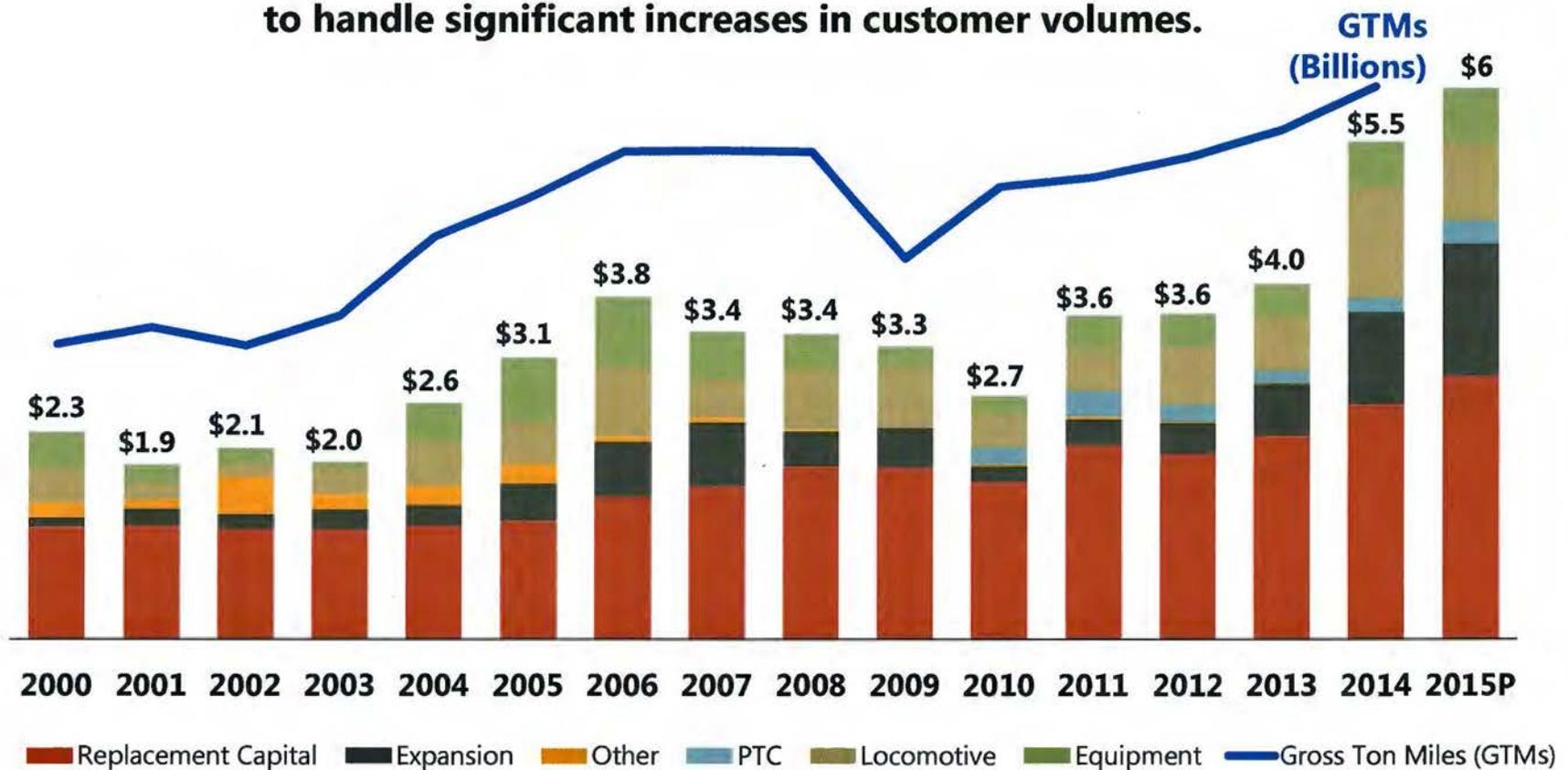


# BNSF's Business Model is Focused on Growing with our Customers

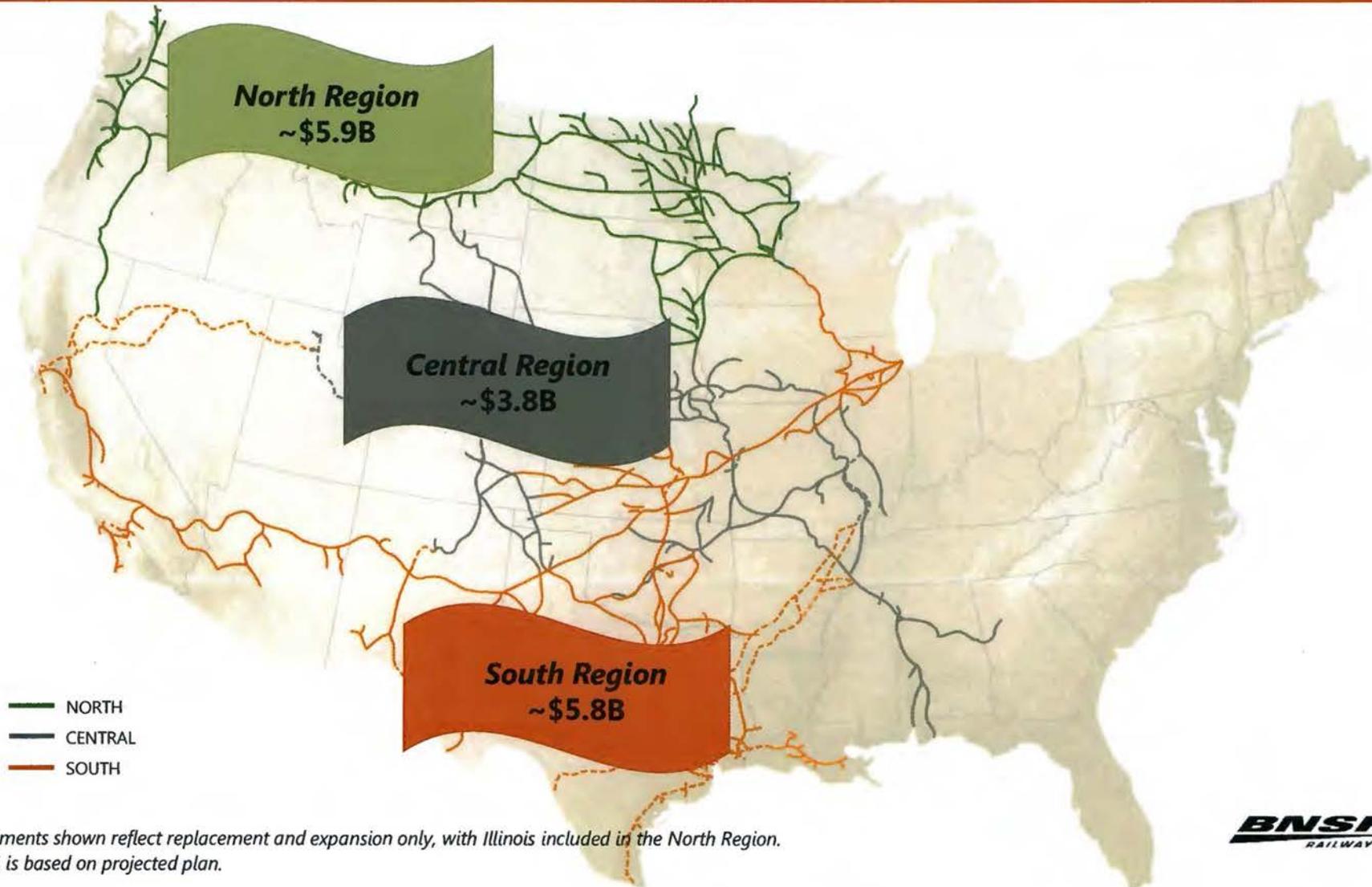


# BNSF is Investing for Growth

Since 2000, BNSF will have invested over \$50 billion to handle significant increases in customer volumes.

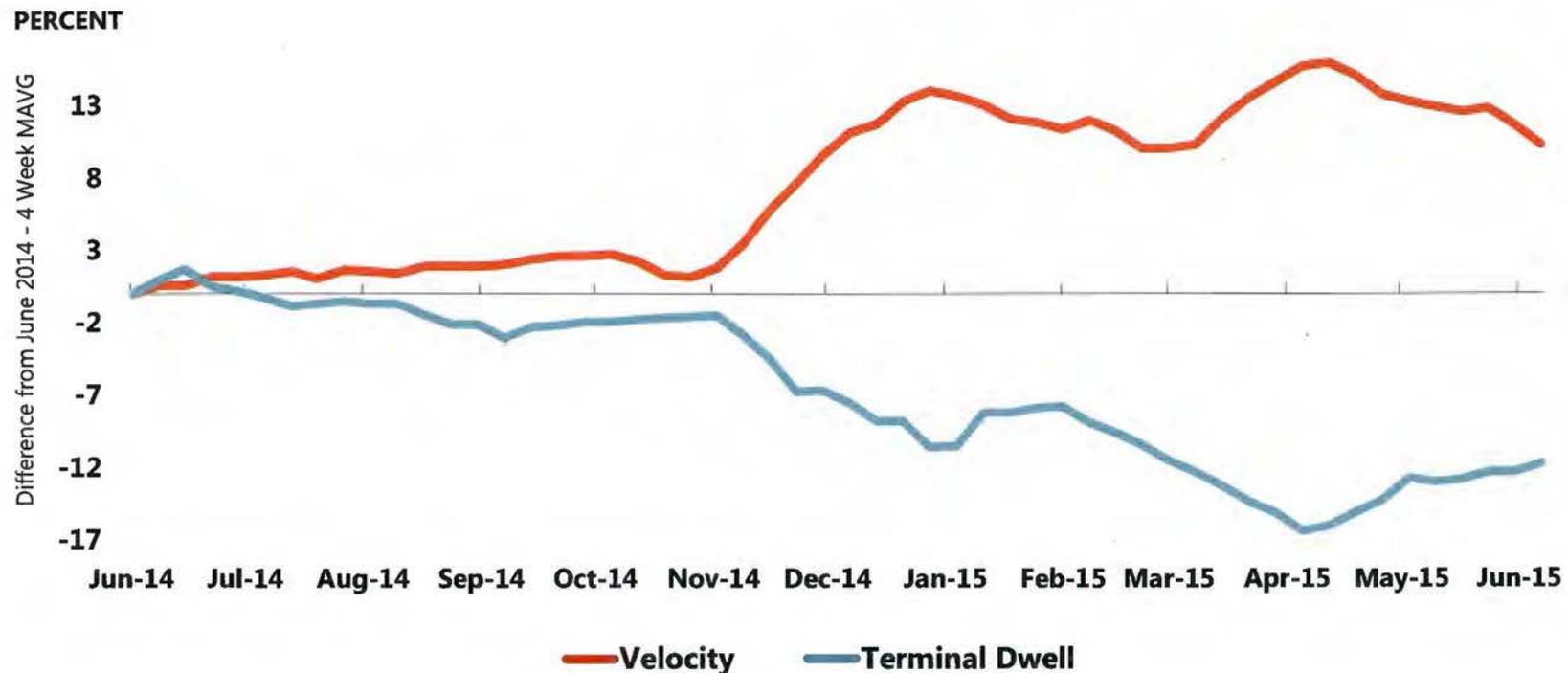


# 2010–2015P\* Capital Investments by Region



# With Added Capacity Comes Improved Performance

**BNSF Velocity (ALL TRAINS) and Weekly Average Terminal Dwell  
Indexed to June 2014\***



\*Four-week moving average [measured in miles per hour (velocity)/hours (terminal dwell)] ending on the dates shown versus the average train speed/average dwell hours recorded for the four-week period ending June 27, 2014

Source: AAR through July 3, 2015

# Capacity Expansion Decision

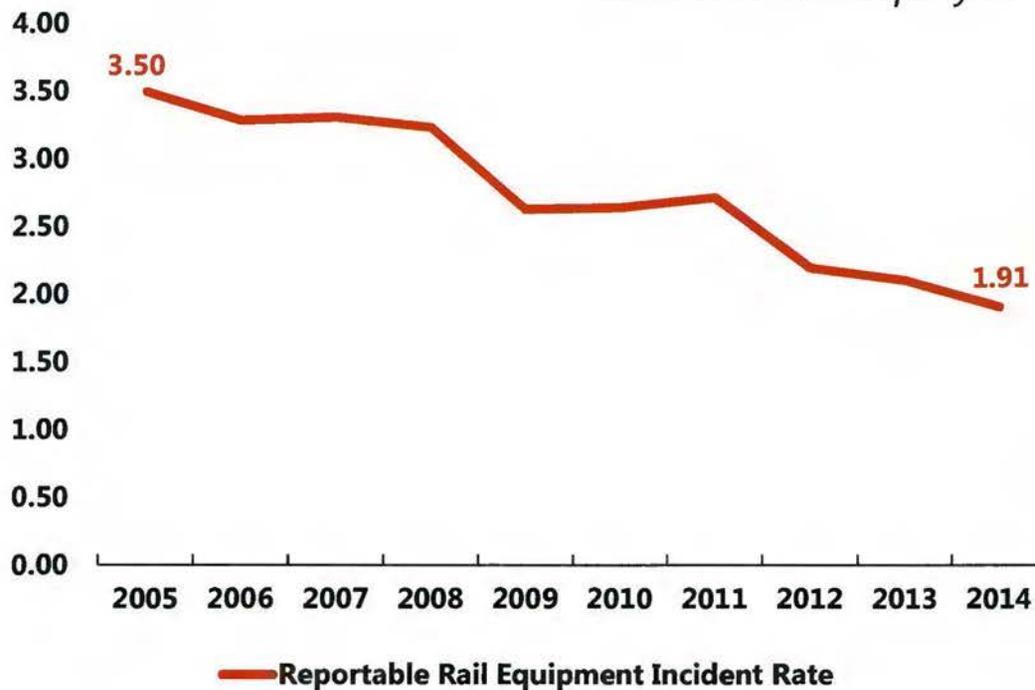


- Investments must earn adequate risk adjusted return
- Significant risk already exists
  - Regulatory process risk
  - Business risk
- Rail assets are long-lived
- Spending front-end loaded
- Returns earned over asset's life

# Investment Drives Innovation, Innovation Drives Improvement

**Capital investments are driving efficiency and reliability.  
BNSF reportable incidents are declining to record-low levels.**

Incidents per  
million train-miles



Source: FRA



# Any Changes in Regulatory Policy Should Not Threaten Investment and Growth

- 1) BNSF's investment is unprecedented.
- 2) Investment is driving improved service & efficiency for customers.
- 3) Customers are responding with investment and volumes on our railroad.
- 4) Stable regulatory environment allows investment & innovation. This incents the right behavior for railroads and suppliers.
- 5) Regulatory changes that disrupt the current balance will have unintended consequences & lower capital investment.
- 6) Any Board consideration of long term revenue adequacy should only occur within individualized rate review process.



**BNSF**<sup>®</sup>  
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# Presentation by Professor Kevin M. Murphy

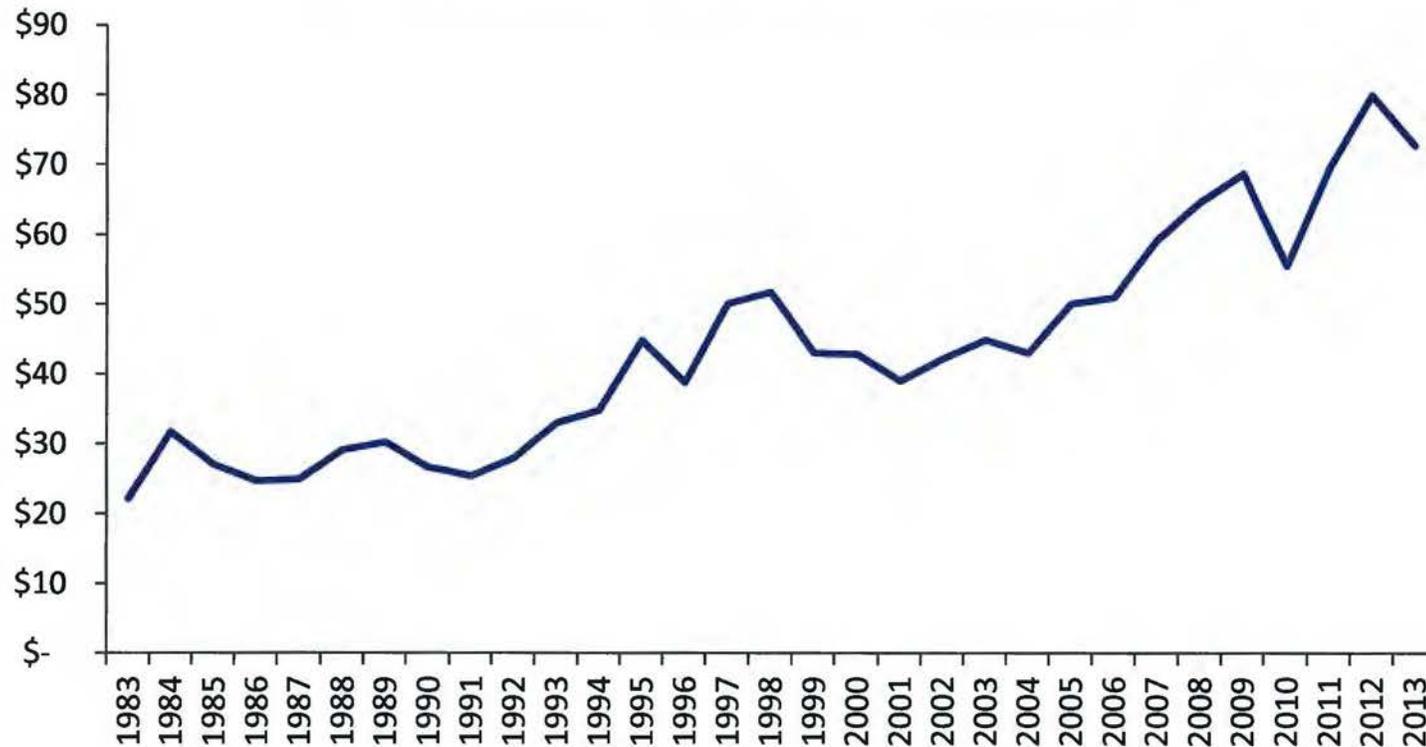
University of Chicago and Charles River Associates

On Behalf of  
Union Pacific Railroad Company

STB Ex Parte No. 722  
July 23, 2015

# UP Must Invest More Intensively to Continue to Improve Service

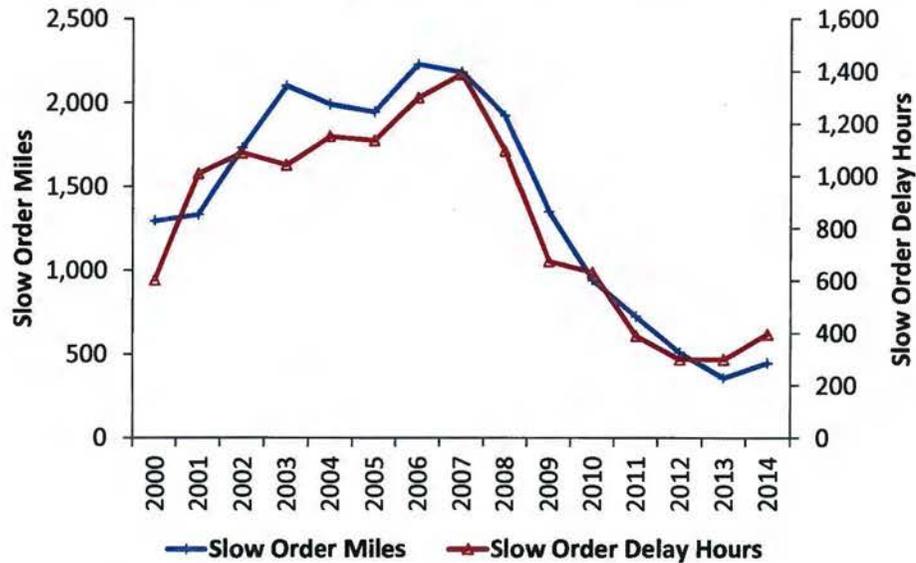
## UP Capital Expenditures Per Track Mile Operated (2013 Constant Dollars in Thousands)



Source: Figure KMM-10. AAR Analysis of Class I Railroads and UP Annual Report R-1 data; U.S. Department of Commerce, Bureau of Economic Analysis (GDP implicit price deflator). Historical data include railroads that later merged with UP.

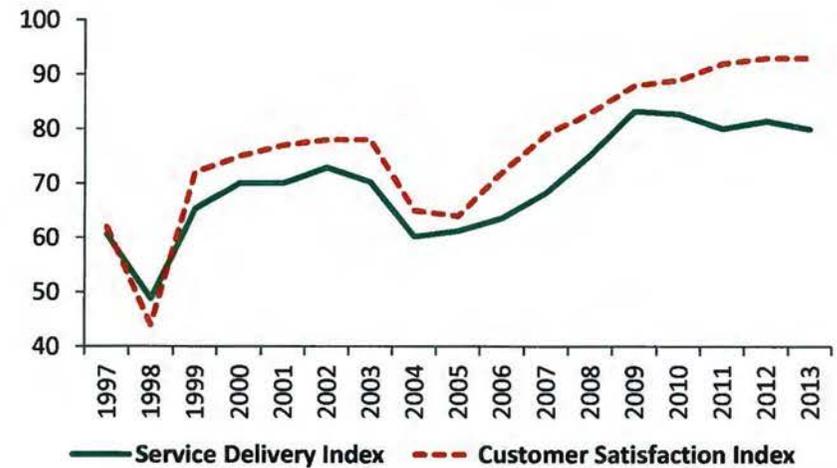
# UP's Investments Have Improved Its Service Quality and Benefited Shippers

**UP Slow Order Miles and Slow Order Delay Hours**



Source: Figure KMM-13. UP.

**UP Service Delivery Index and Customer Satisfaction Index**



Source: Figure KMM-15. UP.

## Rates on UP's Non-Exempt Traffic Have Not Increased Disproportionately Relative to Cost Changes

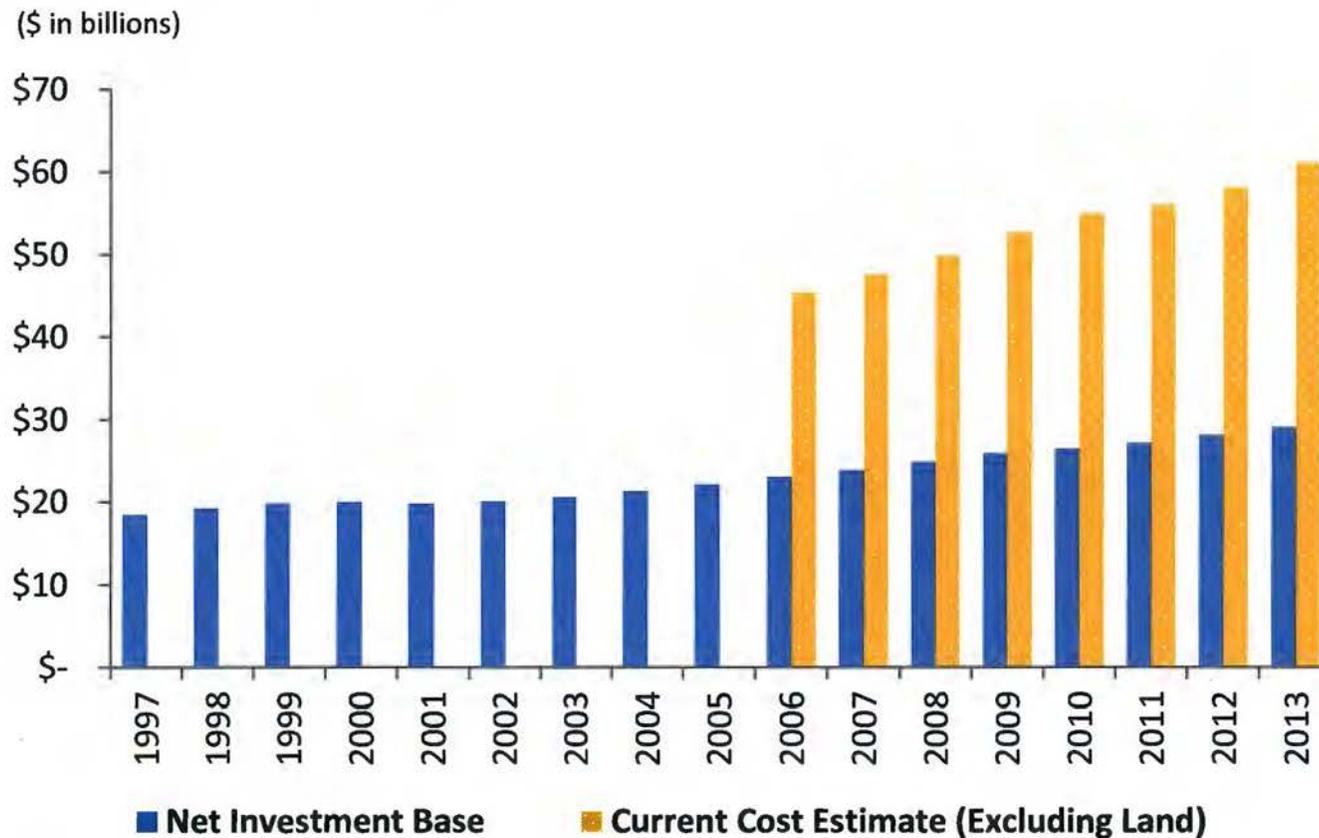
### UP Contribution Margin Change From 2004 to 2012 by Type of Traffic

<u>Type of Traffic</u>	<u>2004</u>	<u>2012</u>	<u>Percentage Point Difference</u>
Non-Exempt	33%	41%	8%
Exempt	20%	32%	12%

Source: Figure KMM-18. STB waybill sample data for UP.

# The STB Measure of UP's Net Investment Base Vastly Understates Replacement Costs

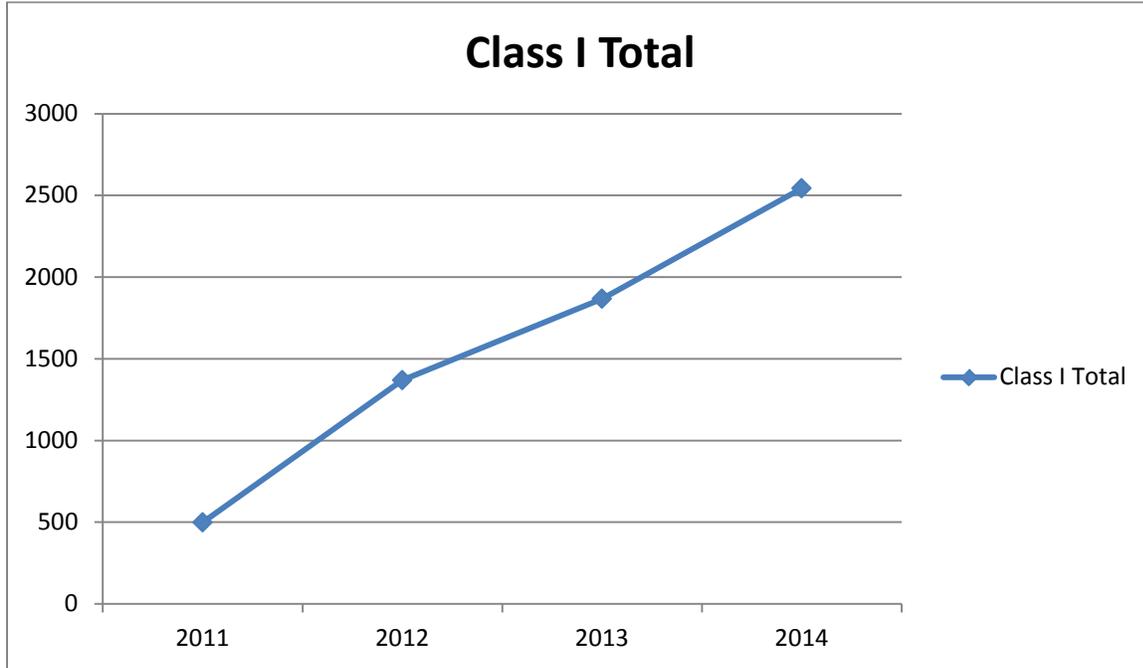
## UP's Net Investment Base and Current Cost Estimate



Source: Figure KMM-11. UP.

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Rail Industry Earnings Above Revenue Adequate Level, 2011-2014 (\$ Millions)



Source: 2011-2013 Opening Comments of AECC (9/5/2014), Appendix A, Table A-1

2014 STB Docket No. EP 558 (Sub-No. 18), Reply Comments of AECC (5/11/2015) at page 4, fn4

# Testimony of the Concerned Shipper Associations

The American Chemistry Council

The Fertilizer Institute

The Chlorine Institute

The National Industrial Transportation League

Submitted to the Surface Transportation Board

July 23, 2015

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# Caves EXHIBIT 1

## Ramsey pricing principles

- Economic efficiency  $\leftrightarrow$  Marginal cost pricing ( $P = MC$ )
- Economies of Scale (high fixed costs)  $\rightarrow MC < AC$ 
  - Marginal cost pricing not feasible
- Profit maximizing solution  $\rightarrow$  Set  $P$  as high as possible above  $MC$ 
  - Economically inefficient
- Ramsey Pricing Principles:
  - Set  $P > MC$ , but only by enough to cover all relevant costs (fixed, variable, investment returns)
  - Constrained optimization: Move  $P$  as close to  $MC$  as possible without violating the revenue adequacy constraint
  - Any rate adjustment closing gap between  $P$  and  $MC$  is economically efficient, even if the full Ramsey optimum is not achieved

## Union Pacific Net Revenue Adequacy -- 2009 to 2014 Business Cycle (\$ in 000)

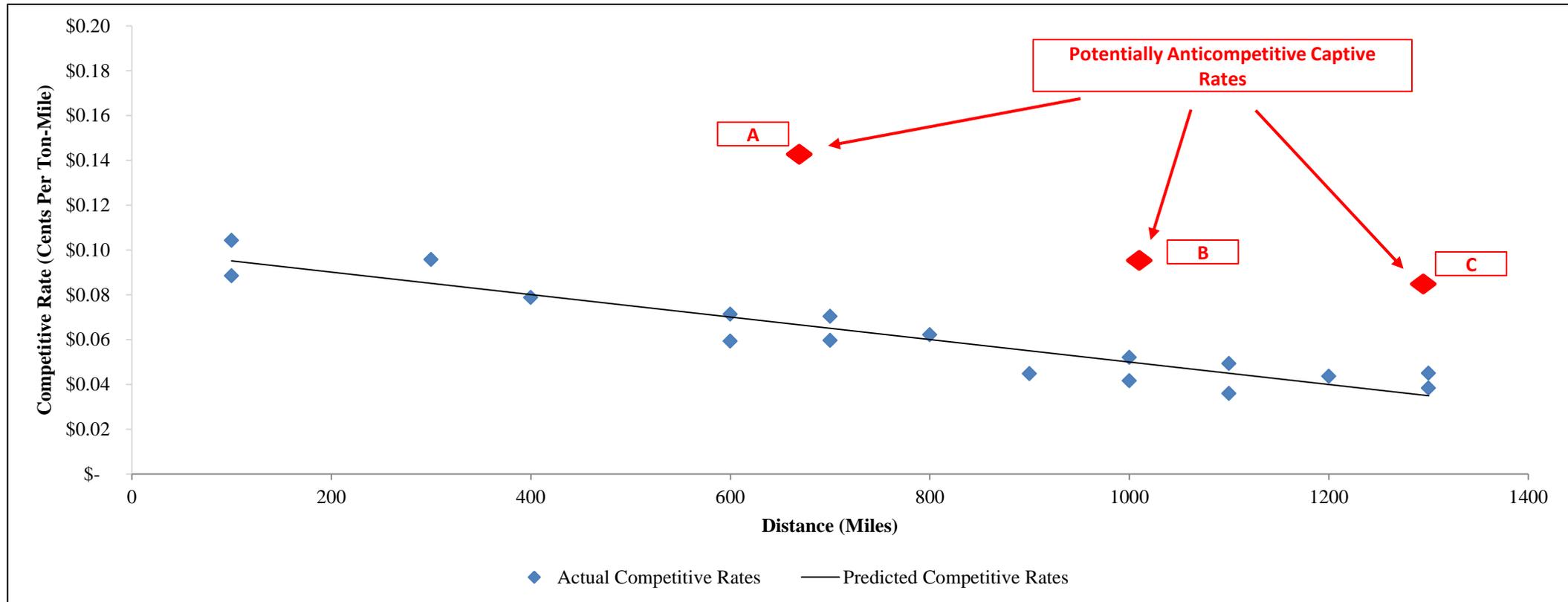
<u>Year</u>		<u>Cost of Capital</u>	<u>Tax Adjusted (shortfall)/surplus</u>	<u>Present Value of Tax Adjusted (shortfall)/surplus</u>
(1)		(2)	(3)	(4)
1.	2009	10.43%	-\$767,046	-\$1,259,671
2.	2010	11.03%	219,718	333,908
3.	2011	11.57%	682,782	948,254
4.	2012	11.12%	1,638,241	2,022,844
5.	2013	11.32%	2,027,153	2,256,626
6.	2014	10.65%	3,336,358	3,336,358
7.	Total	xxx	\$7,137,206	\$7,638,319
8.	Average	xxx	xxx	\$1,273,053

# Caves EXHIBIT 2

## Yardstick/Benchmark Method

– Predict competitive rate, given shipment characteristics:

$$Actual\_Rate_i = \beta_0 + \beta_1 Distance_i + \varepsilon_i$$

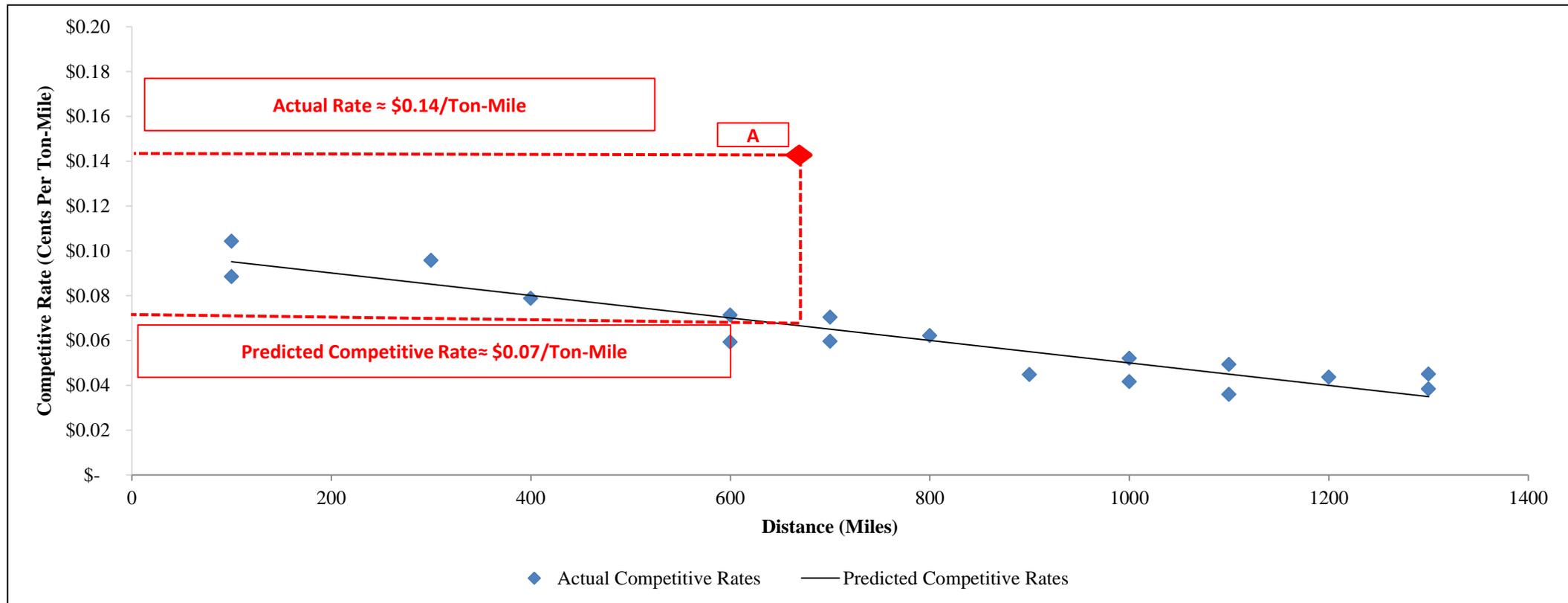


# Caves EXHIBIT 2

## Yardstick/Benchmark Method

- Compare actual captive rates to predicted competitive rates:

$$\text{Predicted\_Rate}_A = \beta_0 + \beta_1 \text{Distance}_A$$

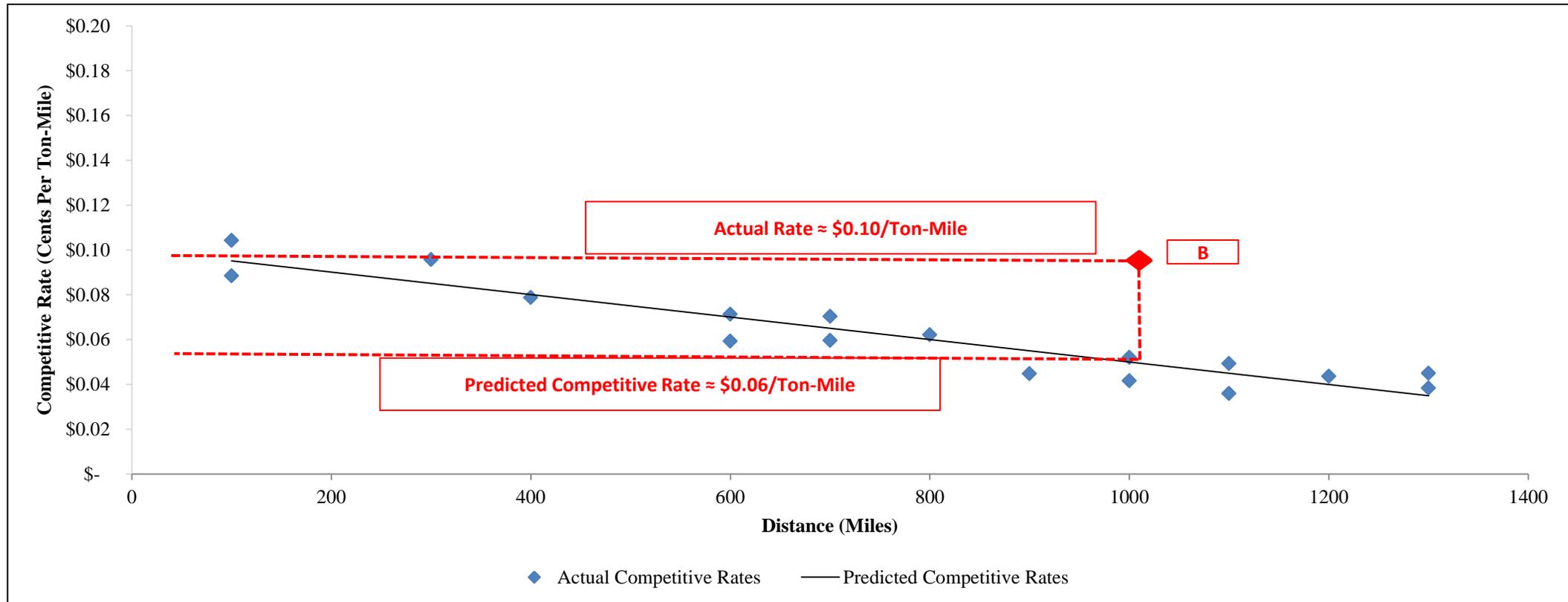


# Caves EXHIBIT 2

## Yardstick/Benchmark Method

- Compare actual captive rates to predicted competitive rates :

$$\text{Predicted\_Rate}_B = \beta_0 + \beta_1 \text{Distance}_B$$

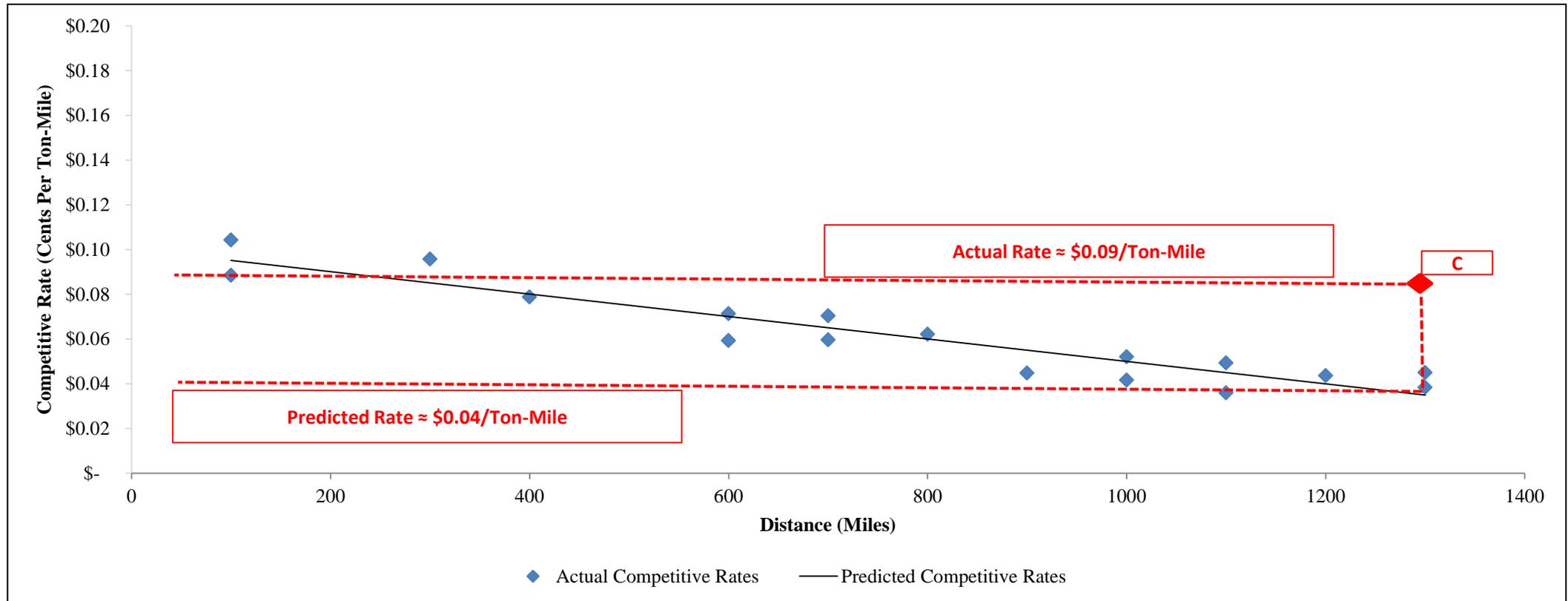


# Caves EXHIBIT 2

## Yardstick/Benchmark Method

- Compare actual captive rates to predicted competitive rates :

$$\text{Predicted\_Rate}_C = \beta_0 + \beta_1 \text{Distance}_C$$



## Caves EXHIBIT 2

### Yardstick/Benchmark Method

- $R = (\text{Actual\_Rate})/(\text{Predicted\_Rate})$ 
  - $R_A \approx \$0.14/\$0.07 \approx 2$
  - $R_B \approx \$0.10/\$0.06 \approx 1.67$
  - $R_C \approx \$0.09/\$0.04 \approx 2.25$
- $R_{MAX}$  = “Allowable Differential”
  - $R_{MAX} = 1.6 \rightarrow$  All rates reduced
  - $R_{MAX} = 1.9 \rightarrow$  Only 2/3 reduced
  - $R_{MAX} = 2.1 \rightarrow$  Only 1/3 reduced
- $R_{MAX}$  calibrated to protect revenue adequacy

# Rebate Reduction Approach Based On Price-Cost Margins For UP Based on 2009 to 2014 Business Cycle

1. UP 2014 Revenues (000s)	\$23,876,553
2. Average Surplus (000s)	1,273,053
3. Potentially Captive Excess Return Share	90%
4. Surplus Available to Potentially Captive Shippers	1,145,748
5. UP Required Revenues (000s)	\$22,730,805
6. Margin Adjustment Factor	95.1%

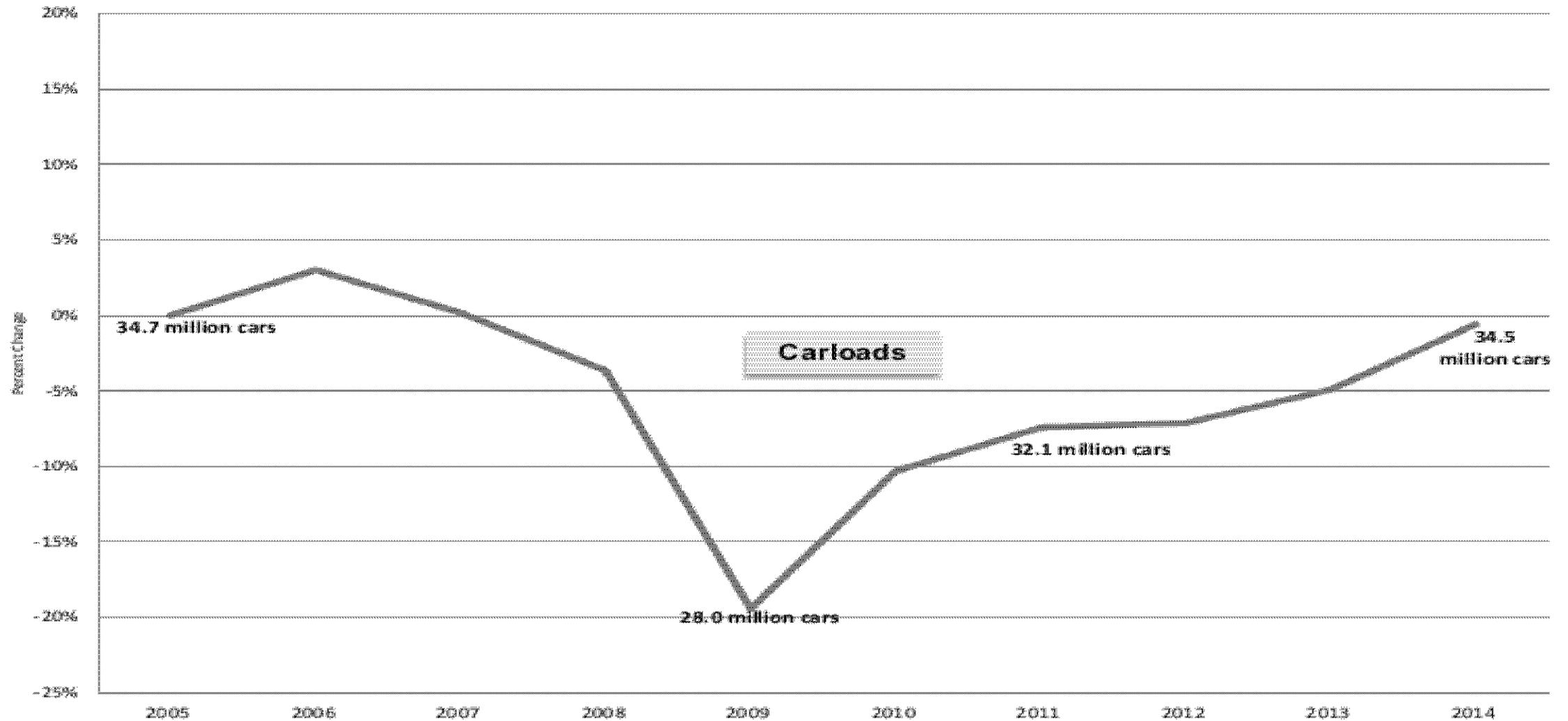
Shipper (1)	Base						Adjusted				Actual Adjustments
	Rates (2)	Costs (3)	Tons (000s) (4)	Total Revenue (000s) (5)	R/VC Ratio (6)	Elasticity Margin (7)	Elasticity Margin (8)	Rates (9)	R/VC Ratio (10)	Total Revenue (000s) (11)	Revenue Reduction (12)
	7. A	\$7.00	\$3.00	1,000,000	\$7,000,000	233.3%	57.143%	54.349%	\$6.57	219.1%	\$6,571,562
8. B	\$11.00	\$5.00	500,000	\$5,500,000	220.0%	54.545%	51.878%	\$10.39	207.8%	\$5,195,167	\$0
9. C	\$10.00	\$4.00	500,000	\$5,000,000	250.0%	60.000%	57.066%	\$9.32	232.9%	\$4,658,334	\$0
10. D	\$8.50	\$4.50	200,000	\$1,700,000	188.9%	47.059%	44.758%	\$8.15	181.0%	\$1,629,189	\$0
11. E	\$8.00	\$6.00	100,000	\$800,000	133.3%	25.000%	25.000%	\$8.00	133.3%	\$800,000	\$0
12. F	\$8.00	\$7.00	100,000	\$800,000	114.3%	12.500%	12.500%	\$8.00	114.3%	\$800,000	\$0
13. G	\$3.23	\$7.00	952,888	\$3,076,553	46.1%	-116.808%	-116.808%	\$3.23	46.1%	\$3,076,553	\$0
14. Total		xxx	3,352,888	\$23,876,553	xxx	xxx	xxx	xxx	xxx	\$22,730,805	xxx

# Rebate Reduction Approach Based On Maximum Markup Methodology For UP Based on 2009 to 2014 Business Cycle

1. UP 2014 Revenues (000s)	\$23,876,553
2. Average Surplus (000s)	1,273,053
3. Potentially Captive Excess Return Share	90%
4. Surplus Available to Potentially Captive Shippers	1,145,748
5. UP Required Revenues (000s)	\$22,730,805
6. MMM R/VC Ratio	218.1%

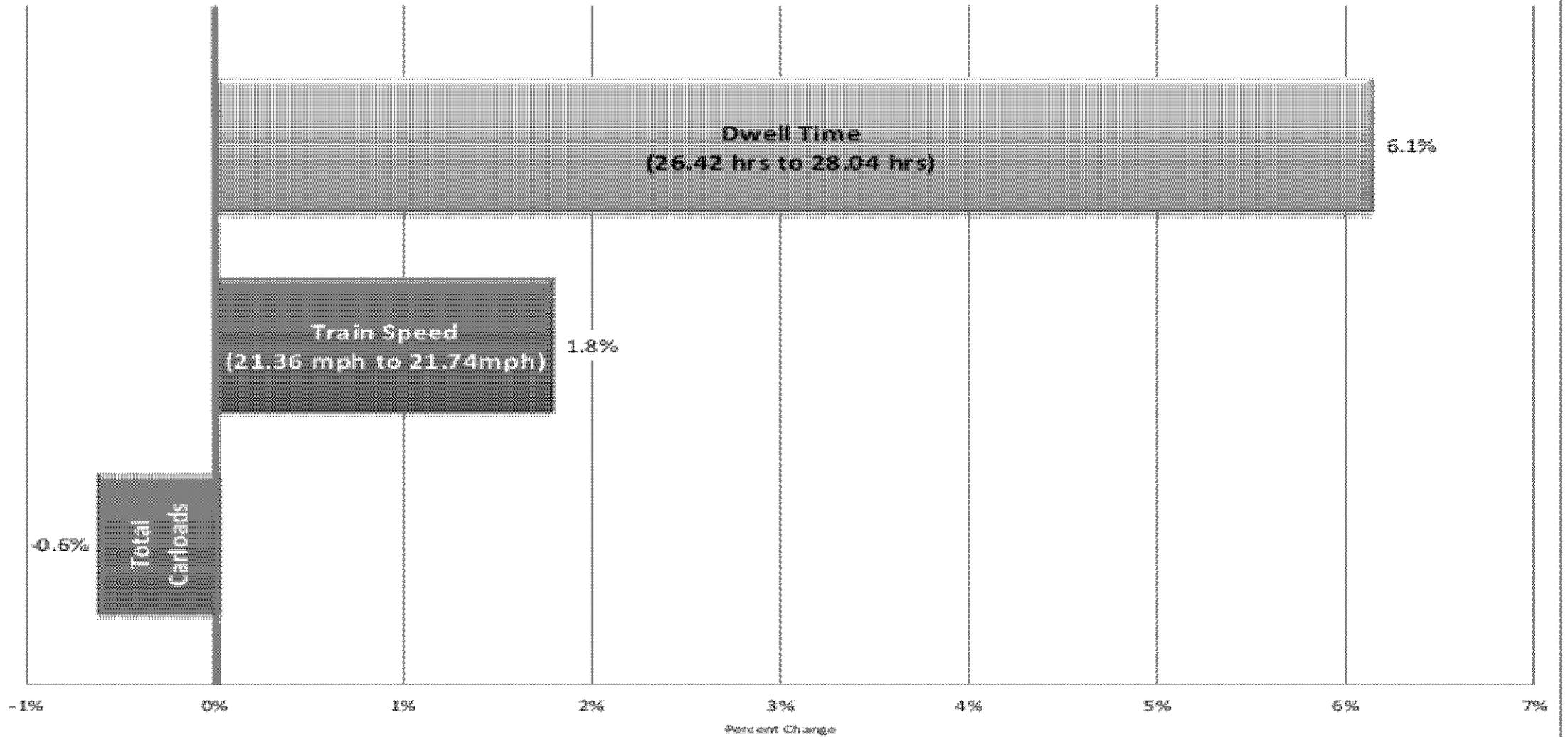
Shipper	Base					Adjusted			Actual
	Rates	Costs	Tons (000s)	Total Revenue (000s)	R/VC Ratio	R/VC Ratio	Rates	Total Revenue (000s)	Adjustments
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
7. A	\$7.00	\$3.00	1,000,000	\$7,000,000	233.3%	218.1%	\$6.54	\$6,541,701	\$687,449
8. B	\$11.00	\$5.00	500,000	\$5,500,000	220.0%	218.1%	\$10.90	\$5,451,417	\$0
9. C	\$10.00	\$4.00	500,000	\$5,000,000	250.0%	218.1%	\$8.72	\$4,361,134	\$0
10. D	\$8.50	\$4.50	200,000	\$1,700,000	188.9%	188.9%	\$8.50	\$1,700,000	\$0
11. E	\$8.00	\$6.00	100,000	\$800,000	133.3%	133.3%	\$8.00	\$800,000	\$0
12. F	\$8.00	\$7.00	100,000	\$800,000	114.3%	114.3%	\$8.00	\$800,000	\$0
13. G	\$3.23	\$7.00	952,888	\$3,076,553	46.1%	46.1%	\$3.23	\$3,076,553	\$0
14. Total		xxx	3,352,888	\$23,876,553	xxx	xxx	xxx	\$22,730,805	xxx

## The Four Major Railroads Consistently Carried Fewer Carloads Between 2005 and 2014



Source: Railroads' annual SEC filings for BNSF, CSX, NS and UP.

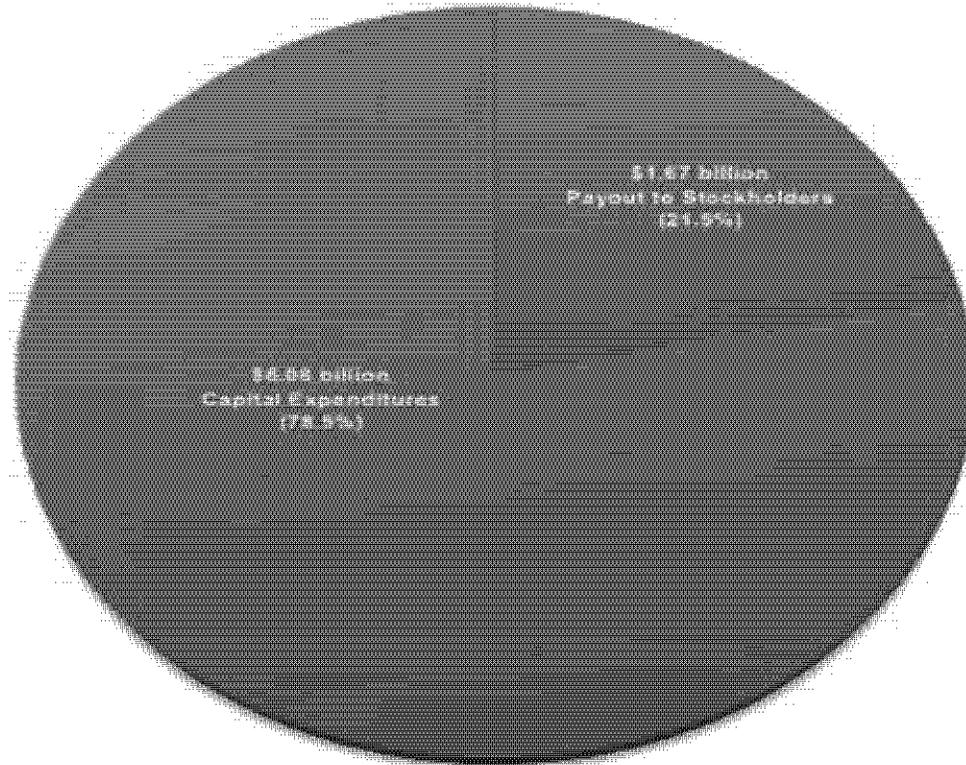
### Operations on the Four Major Railroads Have Not Improved Between 2005 and 2014



Source: Average Train Speed and Dwell Time are from the AAR's weekly Performance Measure filings for BNSF, CSXT, NS and UP. Carloads are from BNSF, CSXT, NS and UP annual SEC filings.

## The Four Major Railroads' Primary Use of Operating Profit has Changed

**2005 CapEx and Payout to Stockholders = \$7.75 billion**



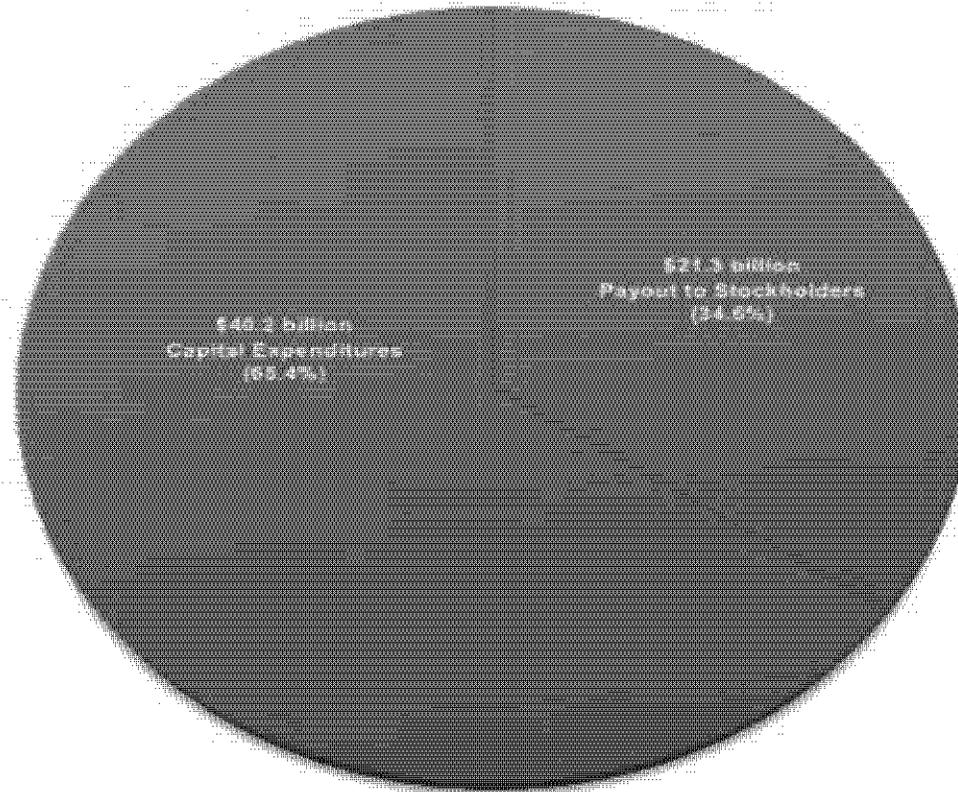
**2014 CapEx and Payout to Stockholders = \$24.67 billion**



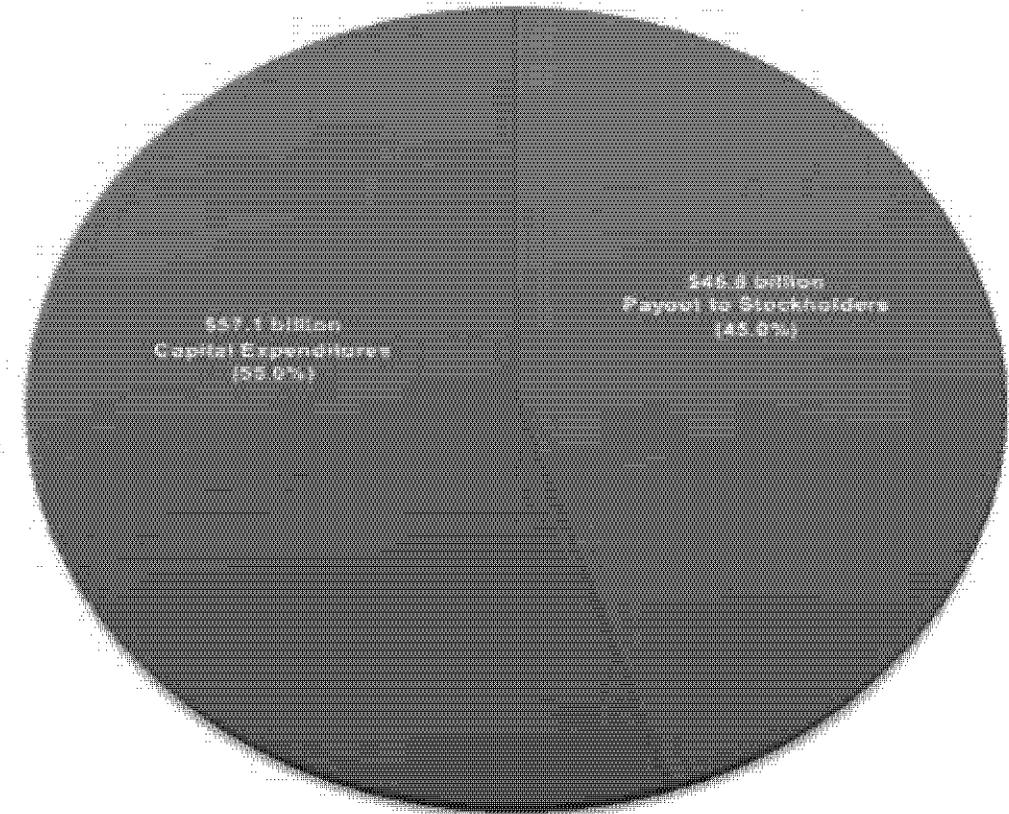
Source: The BNSF, CSXT, NS and UP railroads' annual SEC filings.

## The Four Major Railroads' Primary Use of Operating Profit has Changed

2005-2009 CapEx and Payout to Stockholders = \$61.5 billion

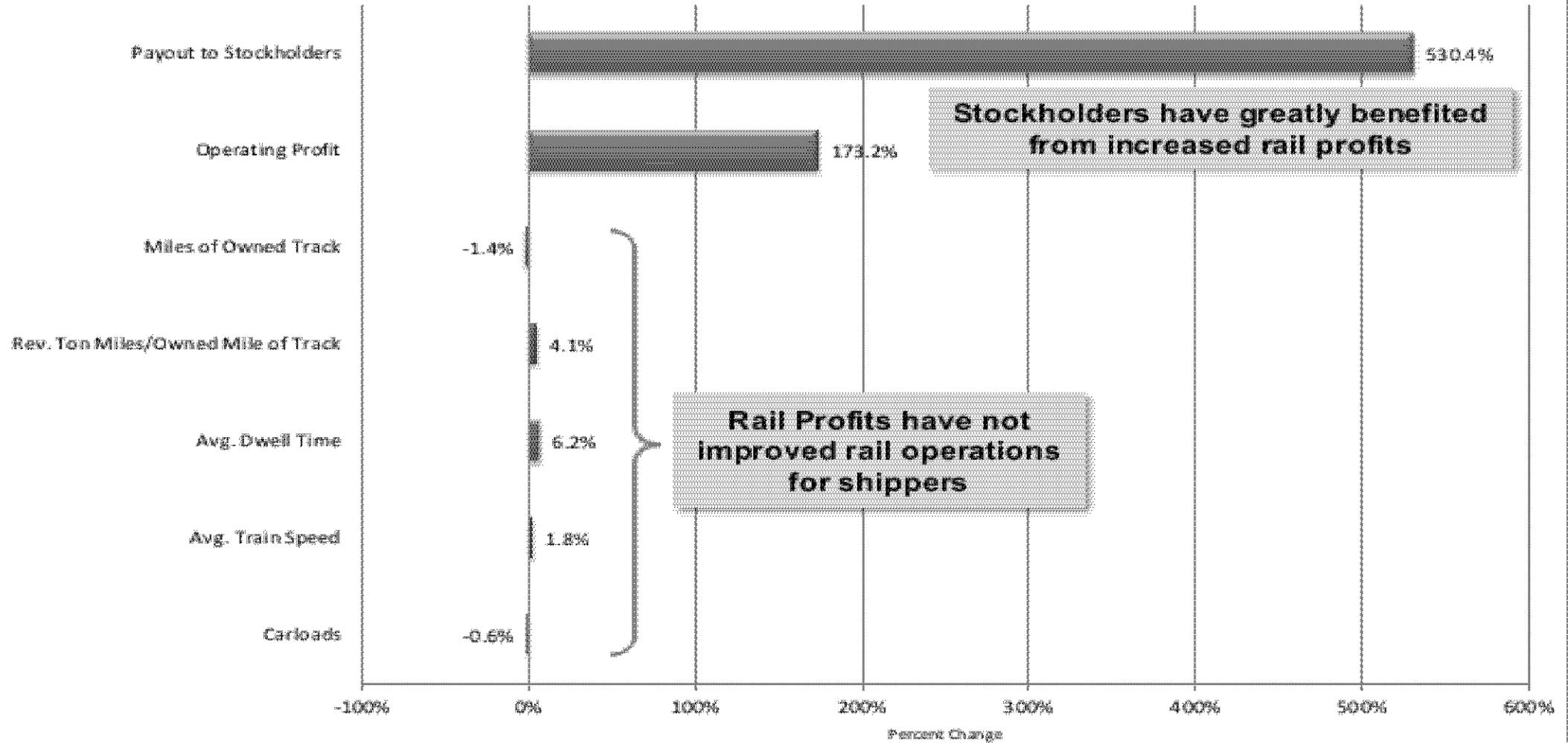


2010-2014 CapEx and Payout to Stockholders = \$103.9 billion



# Capital Expenditures Have Not Increased Rail Capacity

## Operational versus Commercial Changes of the Four Major Railroads Between 2005 and 2014



Source: Carloads, Operating Profit and Payout to Stockholders are from railroads' SEC filings. Train Speed and Dwell Time are from the railroads' weekly filings to the AAR. The percent change in Owned Miles of Track and Millions of Revenue Ton Miles Per Owned Mile of Track are between 2005 and 2013 as these are AAR values for all Class I railroads and are only available through 2013.

## Summary of Big 4 US Railroads' Operational and Commercial Changes Between 2005 and 2014

Operational Changes	2005	2014	Difference	Percent Change
Carloads (000)	34,705	34,497	-208	-0.6%
Avg. Train Speed (mph)	21.4	21.7	0.4	1.8%
Avg. Dwell Time (hours)	26.42	28.04	1.62	6.1%
Miles of Owned Track *	164,291	161,980	-2,311	-1.4%
Millions of Rev. Ton Miles Per Owned Mile of Track *	10.33	10.75	0.42	4.1%

Commercial Changes	2005	2014	Difference	Percent Change	Total \$ 2005-2014
Operating Profit (millions)	\$8,401	\$22,954	\$14,553	173.2%	\$157,320
Payout to Stockholders (millions)	\$1,867	\$10,508	\$8,641	530.4%	\$69,152
Capital Expenditures (millions)	\$6,060	\$14,156	\$8,076	132.8%	\$88,995
Operating Revenue (millions)	\$43,569	\$71,520	\$27,951	64.2%	\$571,888
Average Revenue Per Car	\$1,255	\$2,073	\$818	65.1%	\$1,735
Average Stock Price	\$50	\$134	\$84	167.6%	\$75

All values are for the combination of BNSF, CSX, NS and UP except for miles of Track Owned and Ton Miles Per Owned Mile of Track which are AAR values published for all Class 1 railroads.

Commercial changes are taken from the BNSF, CSX, NS and UP annual reports (10K's) along with annual carloads. Annual Average Train Speed and Dwell Time are taken from the AAR's weekly Performance Measure Rings and an average is calculated for each year.

Average Stock Price is the average for the CSX, NS and UP.

\* Values for Owned Miles of Track and Millions of Revenue Ton Miles Per Owned Mile of Track are for all Class 1 railroads and are only available from the AAR through 2013. These changes are, therefore, between 2005 and 2013.

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# STB Ex Parte 664-2 (Sub-No. 2)

ON BEHALF OF:

The Association of American Railroads

PRESENTED BY

Bente Villadsen  
The Brattle Group

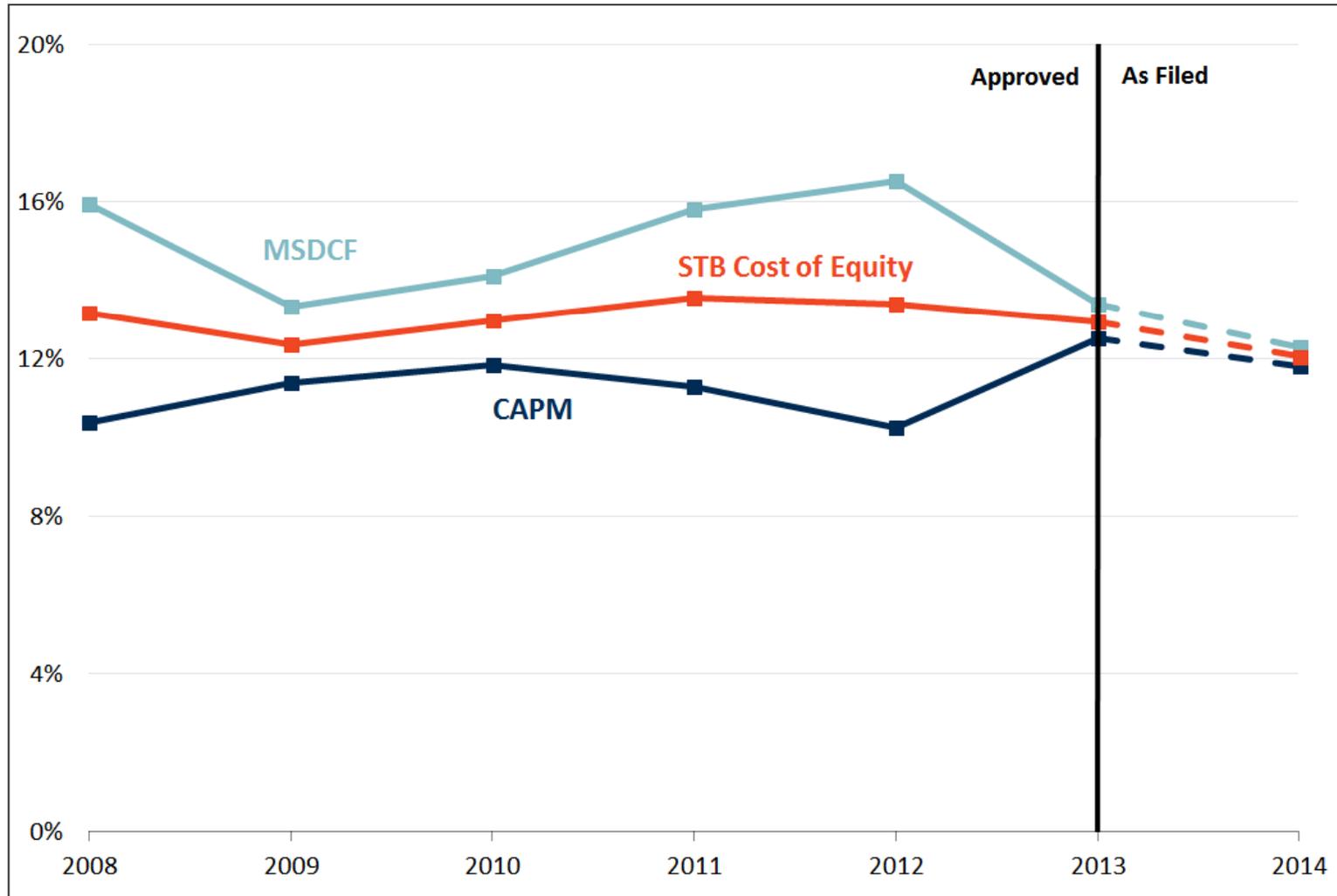
Raymond Atkins  
Sidley Austin, LLP

July 23, 2015

THE **Brattle** GROUP

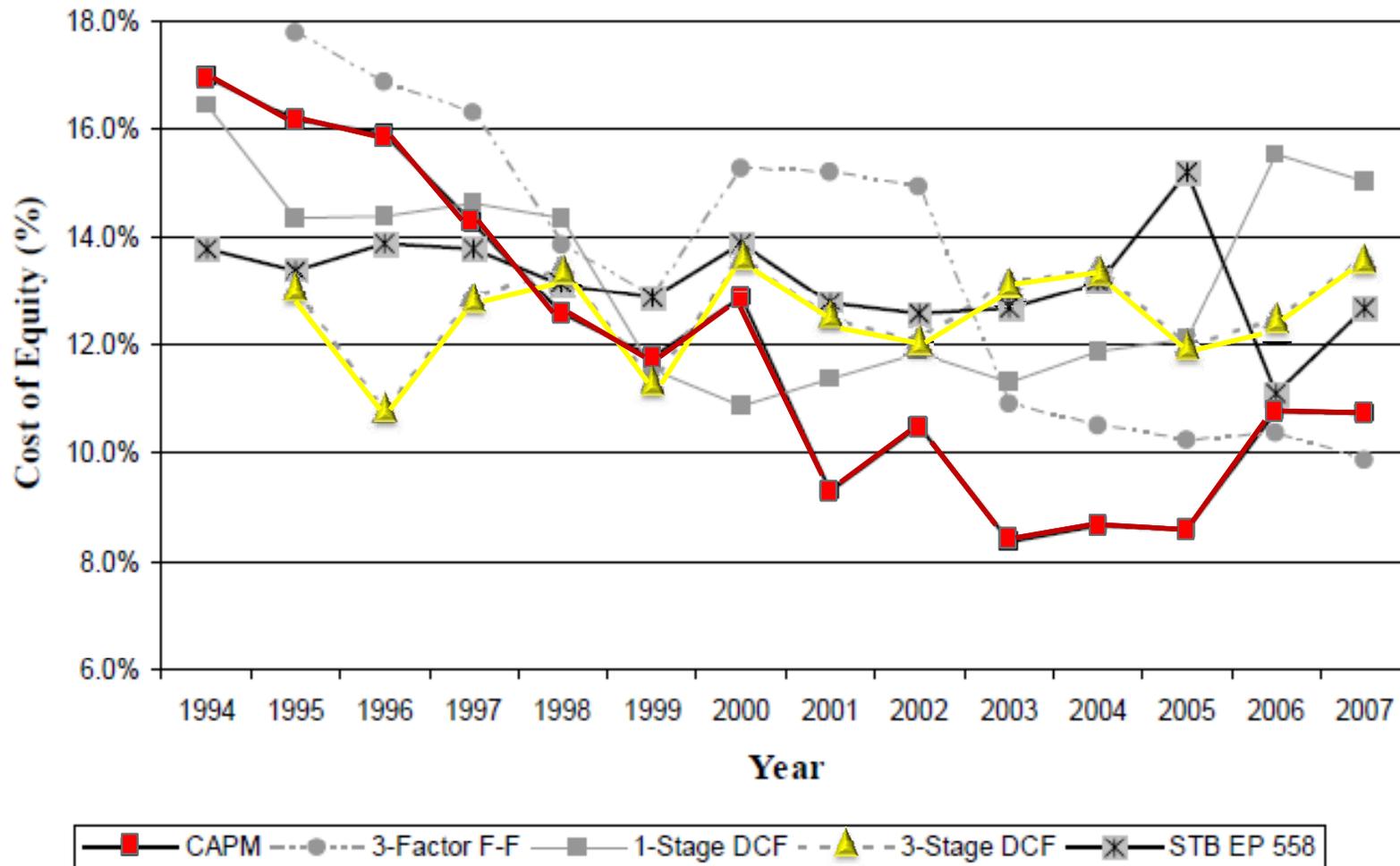
SIDLEY AUSTIN LLP  
**SIDLEY**

## STB CAPM and MSDCF Model Results for 2008 – 2014



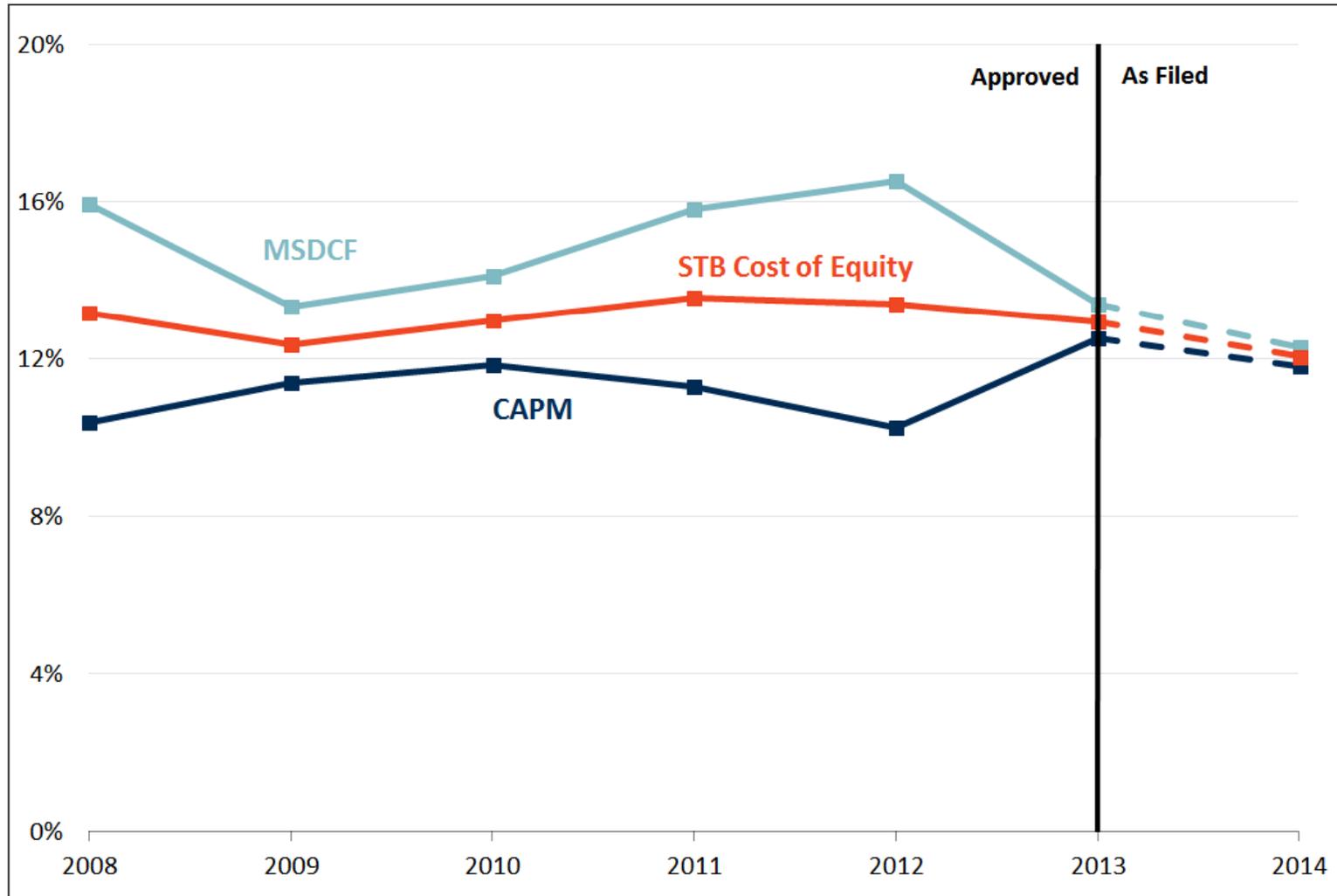
Sources: STB Cost of Capital Decisions 2008–13; AAR filing for 2014

## Models Only Provide a Range of Estimates



Source: STB Docket No. 41191 (Sub No. 1) (May 15, 2009)

## Using an Average is Reasonable

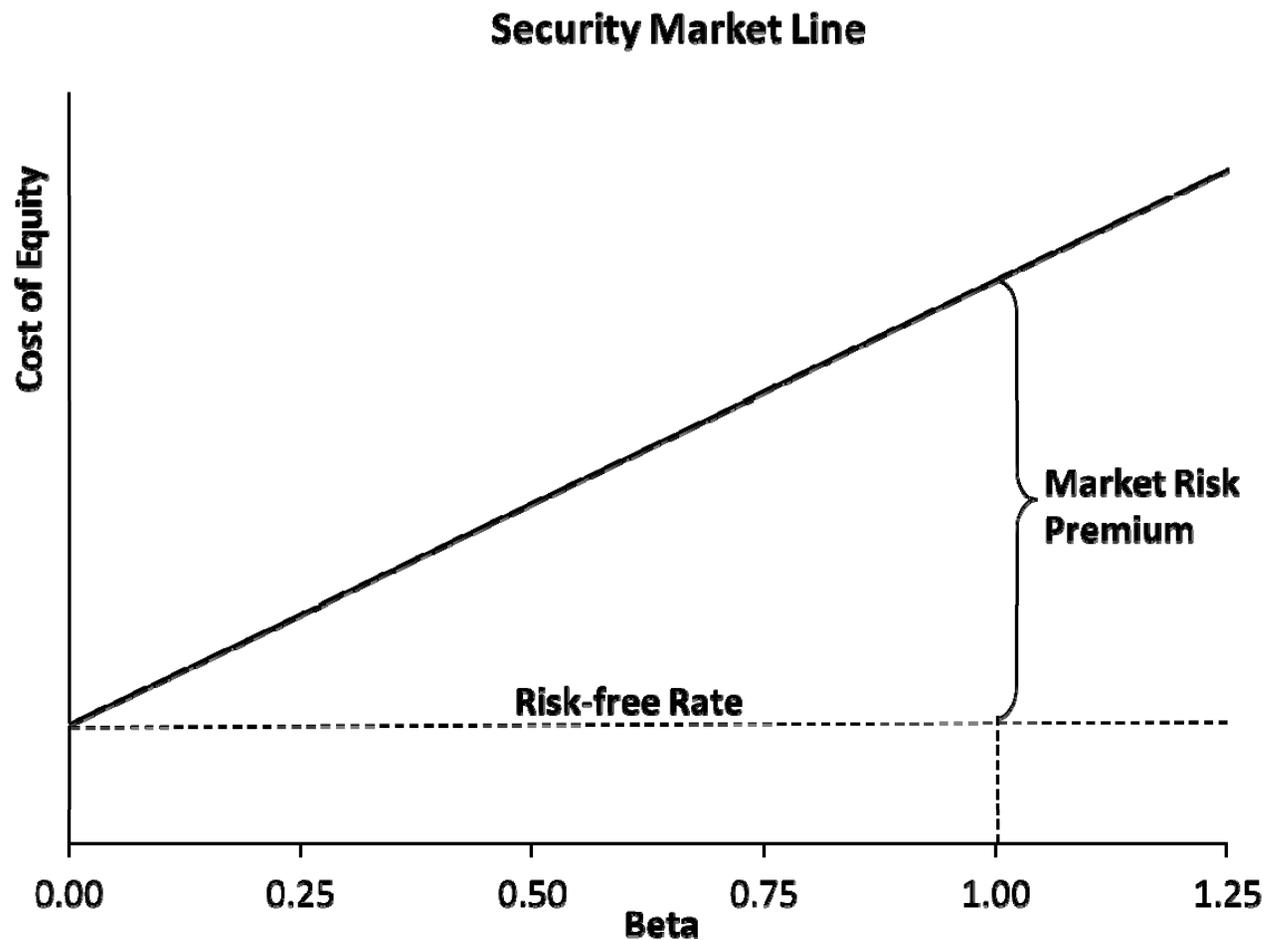


Sources: STB Cost of Capital Decisions 2008–13; AAR filing for 2014

**Dr. Bente Villadsen**  
**The Brattle Group**

## The CAPM Model for Estimating the Cost of Equity

$$\text{Cost of Equity} = \text{Risk-free Rate} + \text{Beta} \times (\text{Market Risk Premium})$$



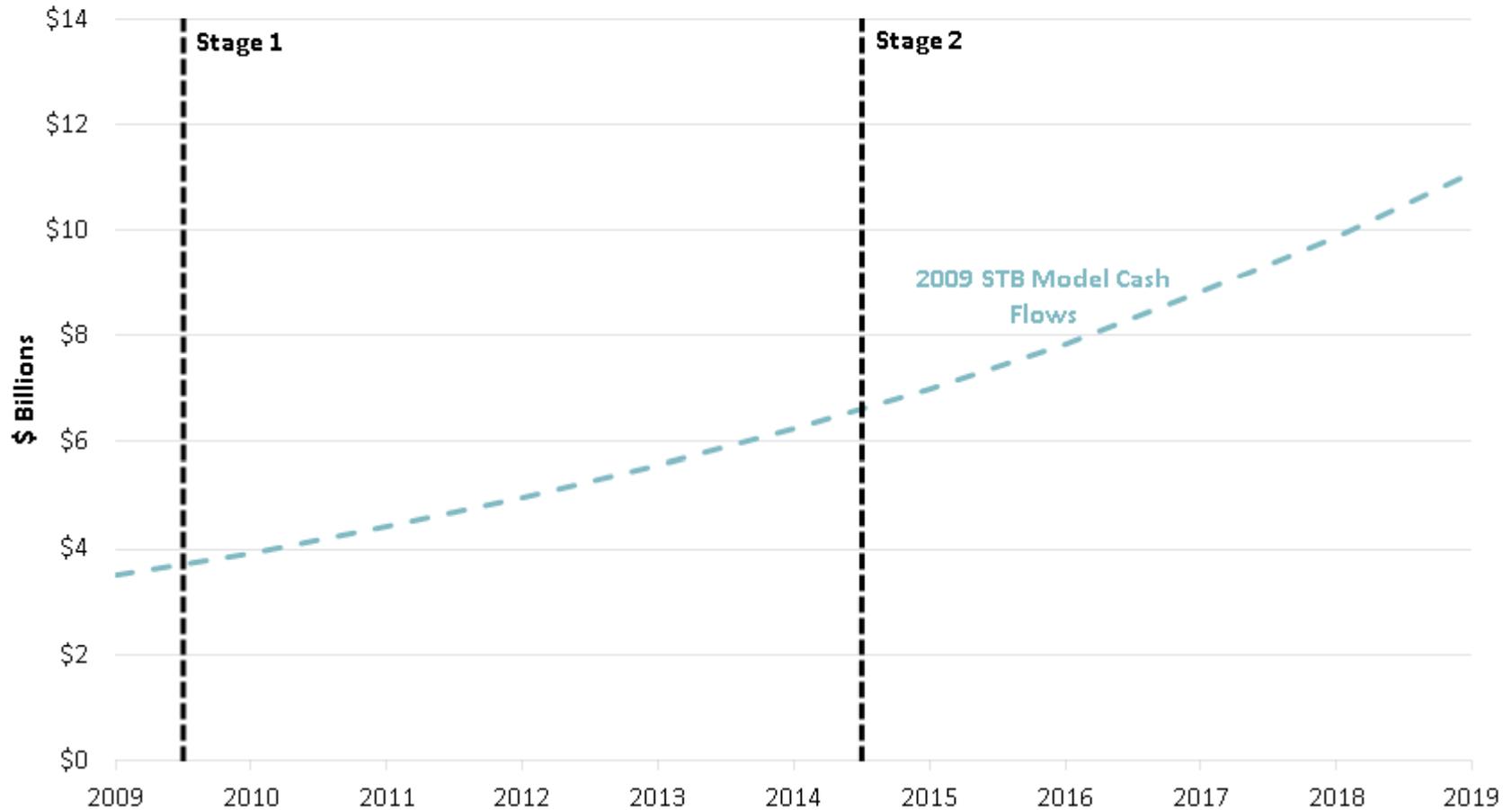
## The DCF Model for Estimating the Cost of Equity

### Basic formula for DCF valuation:

$$V_0 = \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \dots$$

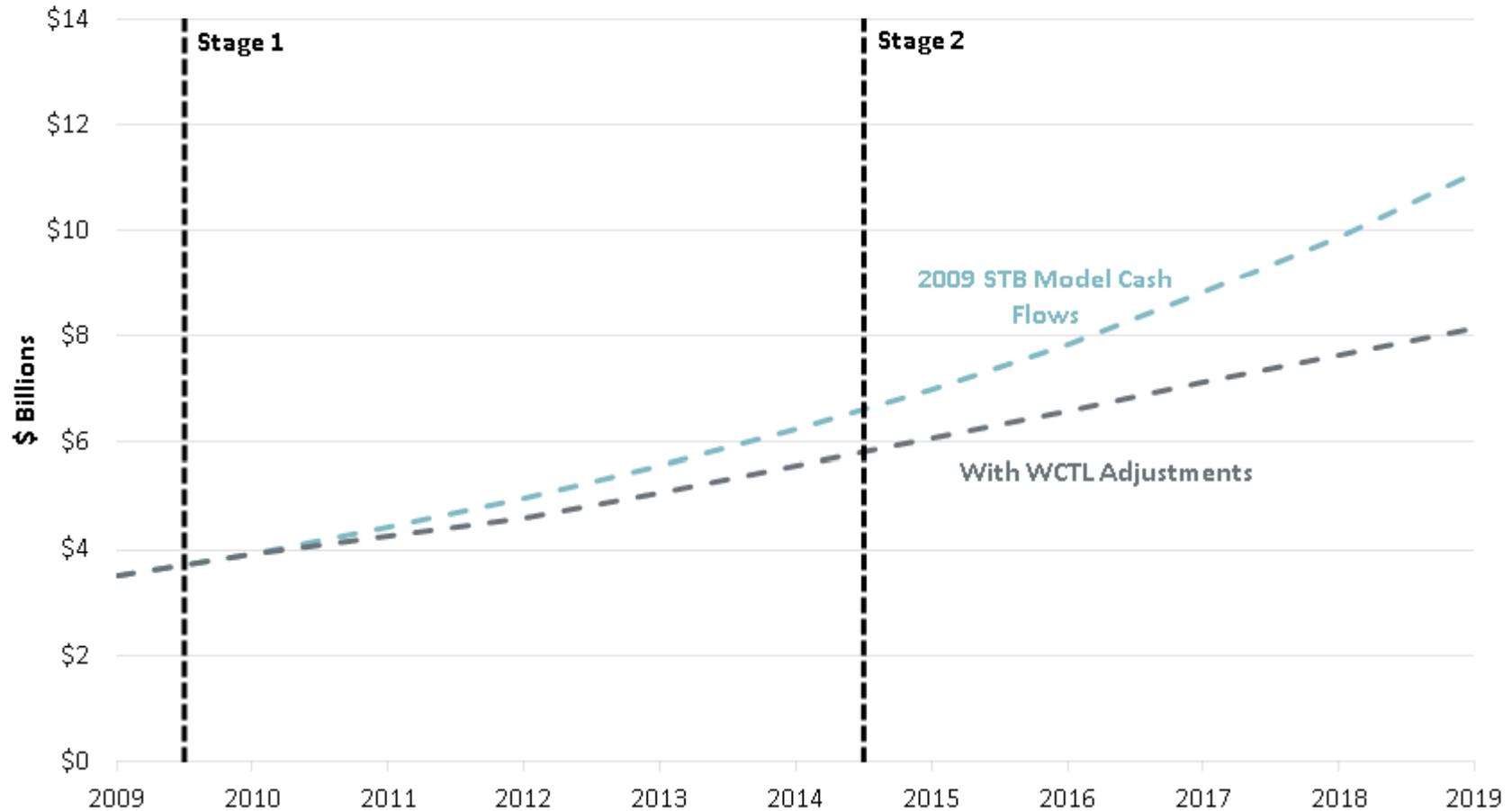
- $C_t$  represents expected cash flow to shareholders in year  $t$
  - $V_0$  represents the current market value of the firm's equity
  - $r$  is the opportunity cost of equity capital
- 
- The DCF is based on the basic finance principle that the value of a firm's equity is the present value of the expected cash flows to its shareholders.
  - Estimate cash flows and solve for the implied discount rate that makes this statement true.

## WCTL Argues that the Board's MSDCF Overestimated Actual Cash Flows



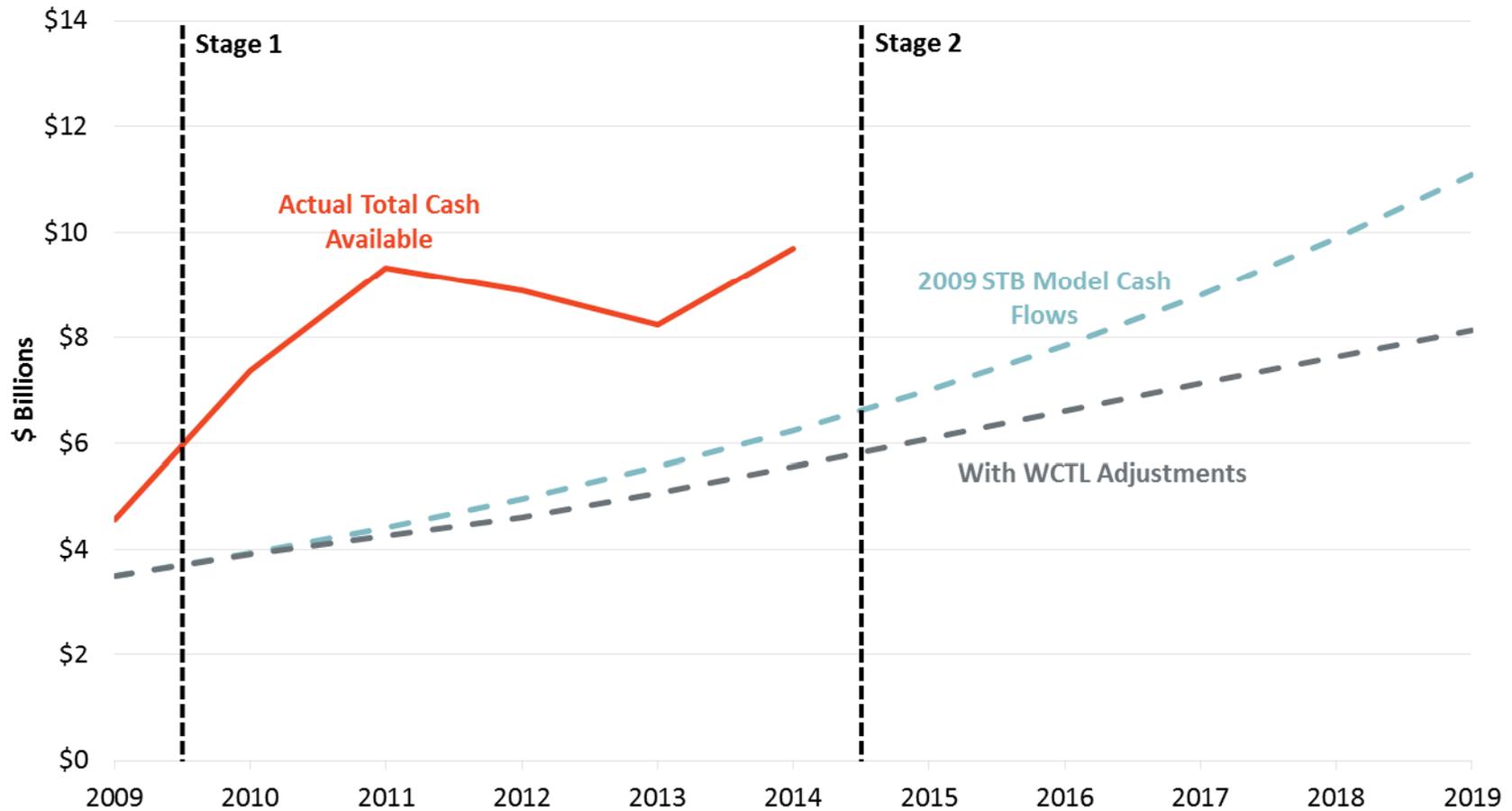
Sources: Dr. Villadsen's Workpapers and Railroad Financial Statements

## WCTL's Adjustments Are Selective and Lack Internal Consistency



Sources: Dr. Villadsen's Workpapers and Railroad Financial Statements

## Actually the STB MSDCF Has *Underpredicted* Available Cash



Sources: Dr. Villadsen's Workpapers and Railroad Financial Statements

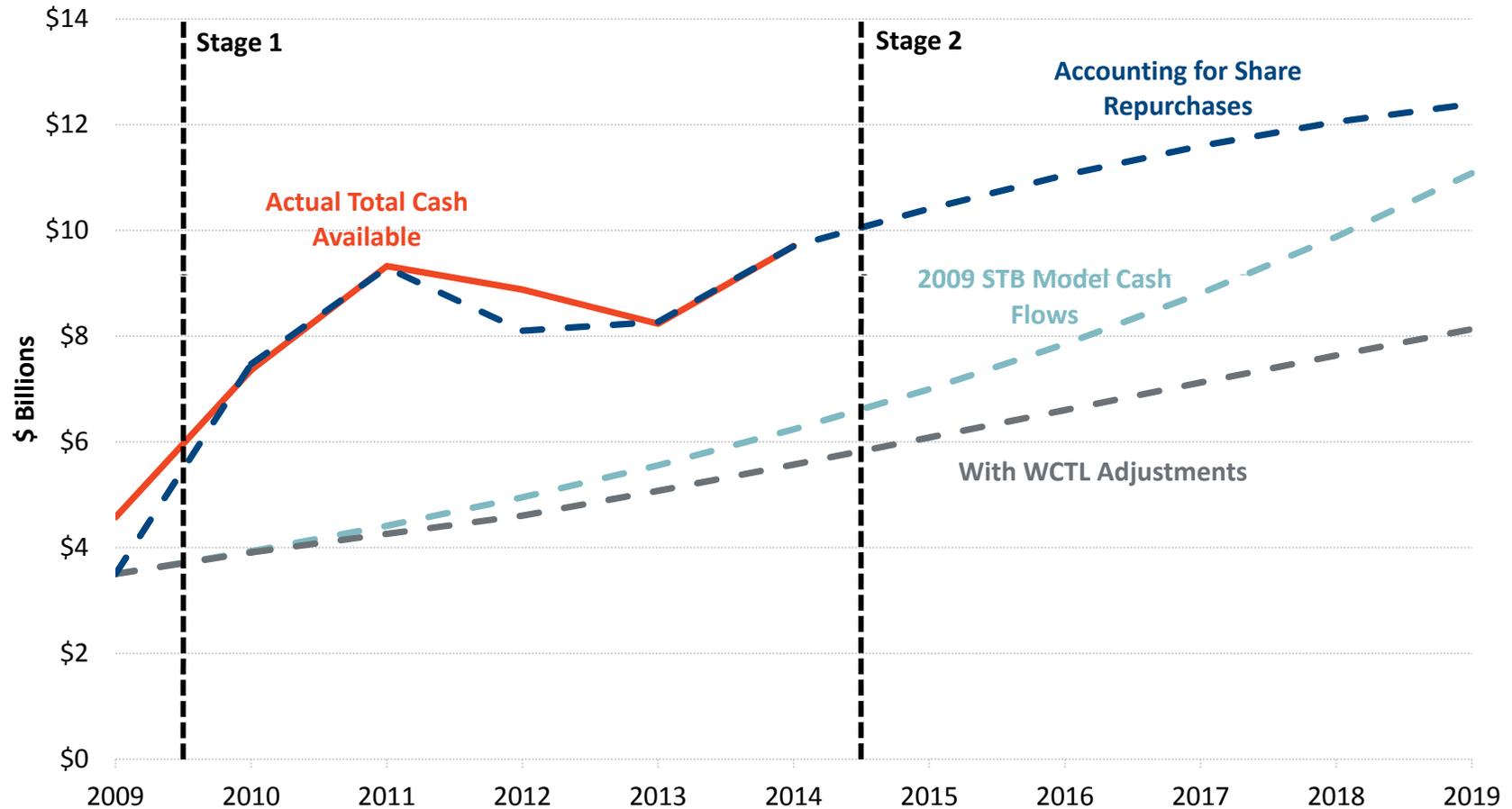
## WCTL Criticisms of the MSDCF are Immaterial

	<b>STB MSDCF</b>	<b>Smoothed Growth and Cash Flows</b>	<b>Share Repurchases</b>	<b>15 years to Steady State</b>
2008	15.95%	15.16%	15.77%	16.61%
2009	13.34%	12.47%	13.19%	13.59%
2010	14.13%	13.60%	13.90%	14.35%
2011	15.83%	14.96%	15.10%	15.79%
2012	16.53%	15.77%	16.08%	16.71%
2013	13.40%	12.72%	12.72%	13.09%
<b>Average</b>	<b>14.9%</b>	<b>14.1%</b>	<b>14.5%</b>	<b>15.0%</b>

Source: Villadsen Verified Statement Table 5

The Board's MSDCF remains the superior model.

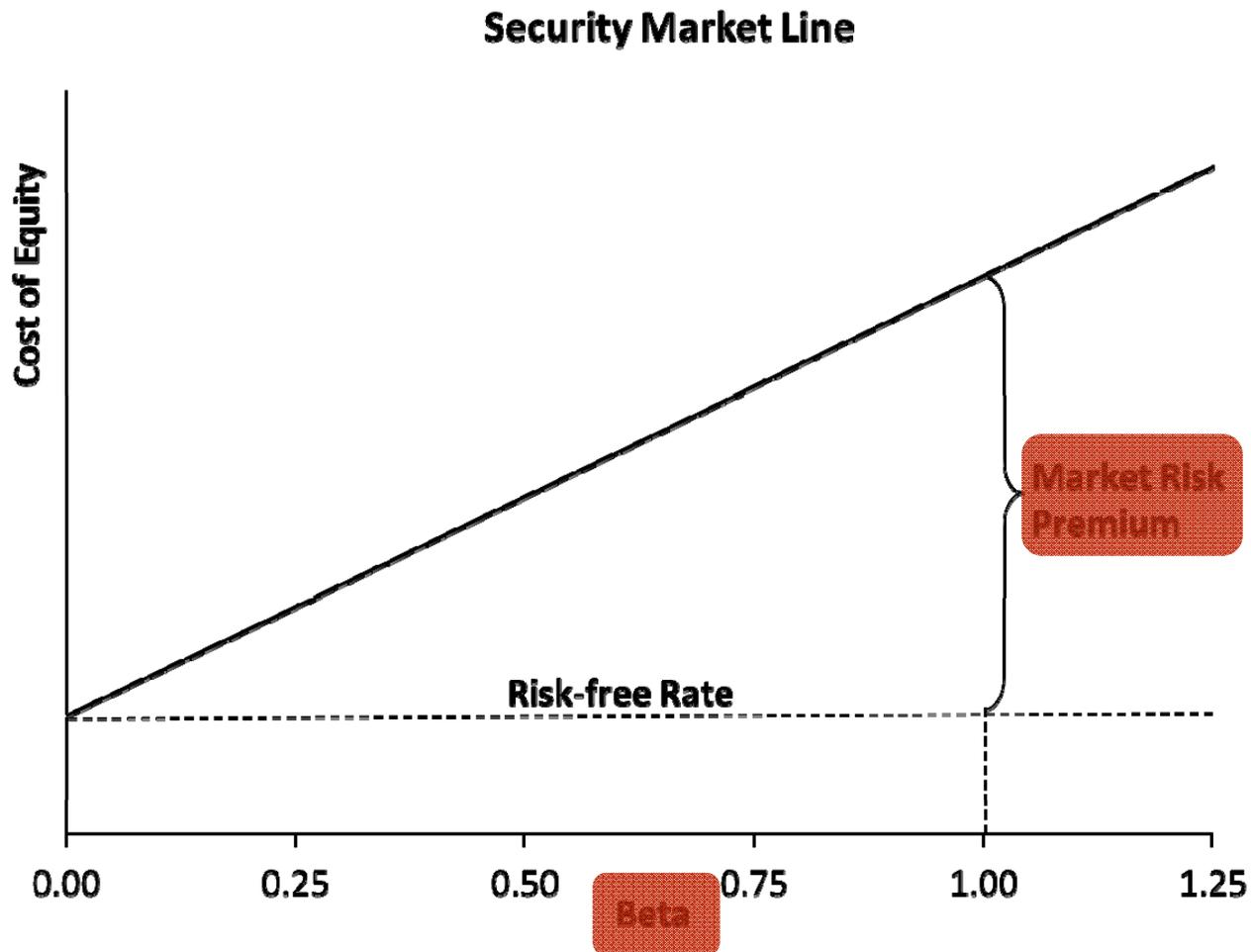
## Dr. Villadsen's Analysis Does Not "Double Count" Cash Flows



Sources: Dr. Villadsen's Workpapers and Railroad Financial Statements

## Estimating CAPM Inputs

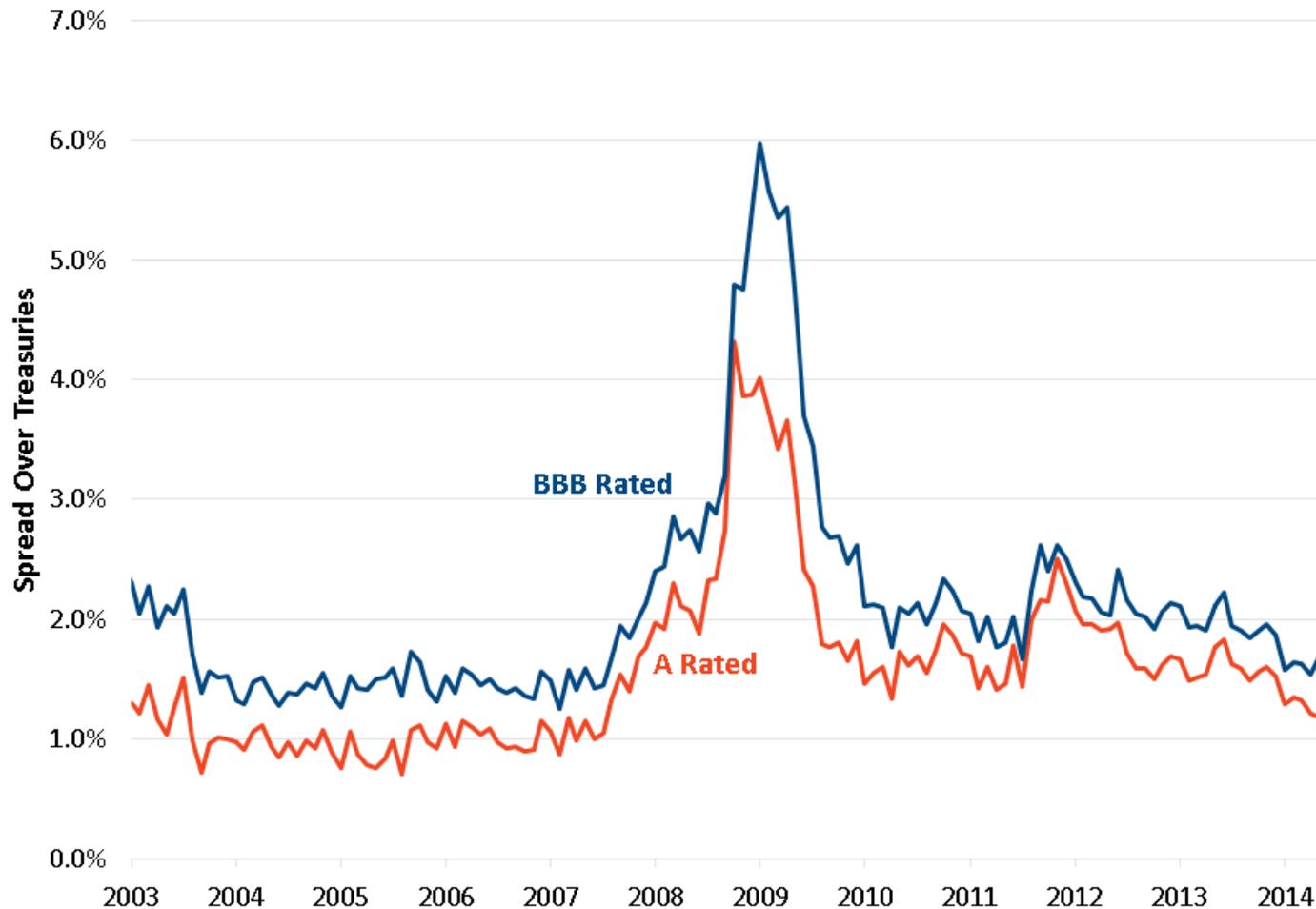
$$\text{Cost of Equity} = \text{Risk-free Rate} + \text{Beta} \times (\text{Market Risk Premium})$$



## The Board should maintain its straightforward approach to measuring beta for the railroads

1. A beta of 1 violates CAPM fundamentals.
2. Betas do not need to be adjusted.
  - the Vasicek adjustment is theoretically preferable to the Blume adjustment
3. There is no need to expand the number of railroads.
4. The Board should not replace railroads with the S&P 500.

## Following the Financial Crisis, Government Bond Yields May Not Be a Good Measure of Required Corporate Returns



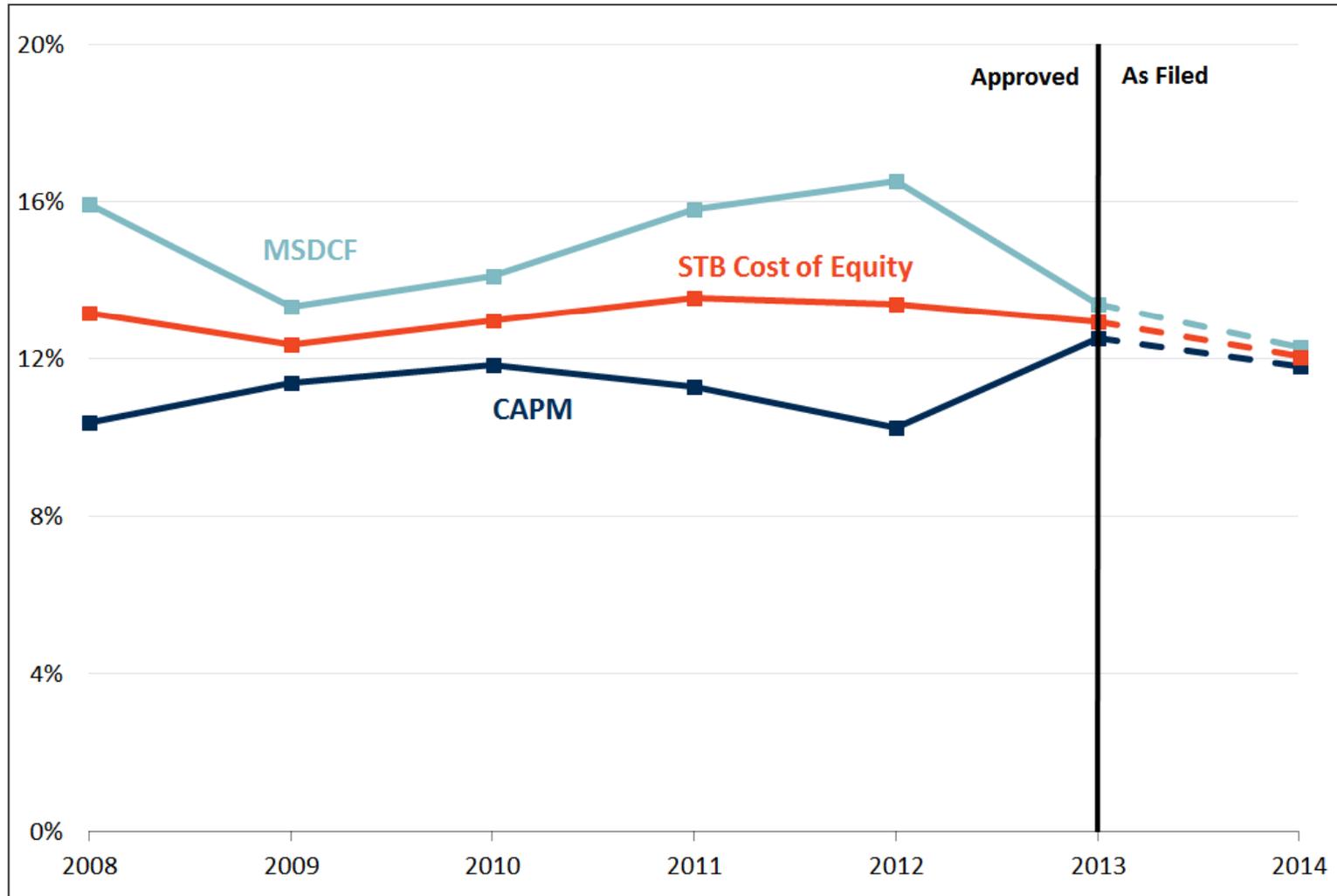
Source: Villadsen Verified Statement Figure 1

## Forward-looking MRP Estimates have Exceeded Historical Averages

Year	Annual Forecasted MRP (Bloomberg)	Annual Historical MRP (Ibbotson)	Forecasted MRP (Value Line)
2008	7.83%	6.47%	
2009	8.55%	6.67%	
2010	8.03%	6.72%	
2011	7.97%	6.62%	
2012	8.86%	6.70%	12.52%
2013	7.72%	6.96%	9.97%
2014	7.20%	7.00%	9.67%
<i>Average</i>	<i>8.16%</i>	<i>6.73%</i>	<i>nmf</i>

Sources: Villadsen Verified Statement, Table 2; Ibbotson SBBI 2014; and Bloomberg, June 2015

## The Board's CAPM May Have Been *Understating* the Cost of Equity in the Recent Past



Sources: STB Cost of Capital Decisions 2008–13; AAR filing for 2014

“Use more than one model when you can. Because estimating the opportunity cost of capital is difficult, only a fool throws away useful information.”

Professor Stewart Myers

**Raymond Atkins**  
**Sidley Austin, LLP**

**What do WCTL's own members  
say about using multiple models?**

“[N]o individual model is more reliable than all others under all market conditions. Therefore, it is both **prudent** and **appropriate** to **use multiple methodologies** in order to mitigate the effects of assumptions and inputs associated with any single approach.”

## **Kansas City Power & Light (January 2015)**

Direct Testimony of Robert Hevert on behalf of KCP&L, January 2, 2015

“It is **essential** that the Commission **employ a variety of techniques** to measure the Company’s cost of equity because of the limitations/infirmities that are inherent in each method.”

## **Wisconsin Public Service Corporation (April 2015)**

Direct testimony of Paul R. Moul for Wisconsin Public Service Corporation in application for Authority to Adjust Electric and Natural Gas Rates, 6690-UR-124, April 17, 2015

“Despite the theoretical appeal of, or preference for, using a particular method to estimate the cost of equity, **no single approach can be regarded as wholly reliable.**”

**Entergy Arkansas, Inc. (April 2015)**

Direct Testimony of Bruce H. Fairchild on behalf of Entergy Arkansas, Inc. before the Arkansas Public Service Commission, Docket No. 15-015-U, April 24 2015.

# **What do WCTL's own members say about the Market Risk Premium?**

Year	WCTL Member	Recommended Market Risk Premium
2015	Kansas City Power & Light	10.47% – 10.58%
2015	Wisconsin Public Service	7.55% – 8.03%
2015	Entergy	9.10%
2014	MidAmerican Energy	7.0%
2014	Ameren	9.28% – 10.02%



CONTRAST

“[T]he Market Risk Premium in the current environment should not exceed 4.7%.”

WCTL Opening Submission to STB (September 2014)

“As there are many different ways to estimate the cost of equity, the Board must take great care not to swing back-and-forth between parties’ preferred methodologies based on the results of the different approaches.”

Surface Transportation Board (2007)