Study of Competition in the Railroad Industry and Analysis of Proposals that Might Enhance Competition

Kelly Eakin
Senior Vice President
Christensen Associates

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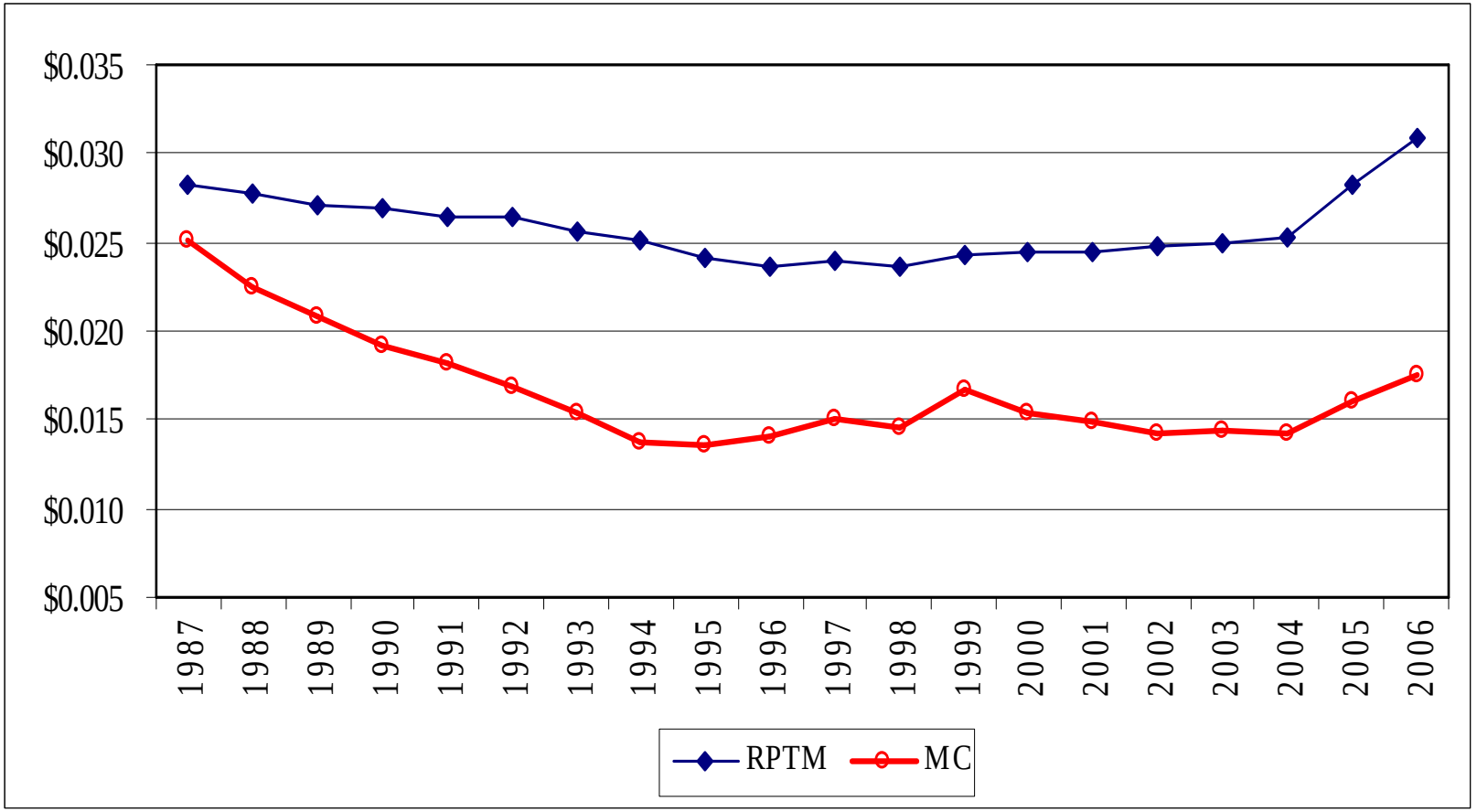
Project Background

- A 2006 GAO study noted that railroad rates had begun to increase after having declined for most of the post-Staggers era
  - Posed the question of why this was happening – were railroads increasingly exercising market power?
  - Recommended that the STB look into this
- The Christensen Associates team was selected by the STB to perform an independent study of competitive issues in the U.S. freight railroad industry

Railroad Economics

- Economies of density and fixed costs require pricing above marginal cost to cover total costs
  - Economies of density – costs fall as traffic over network increases
- By definition, price above marginal cost is the exercise of market power, but exercise does not imply abuse
- Railroads use differential pricing to recover their total costs
  - Different markups of rates over marginal costs

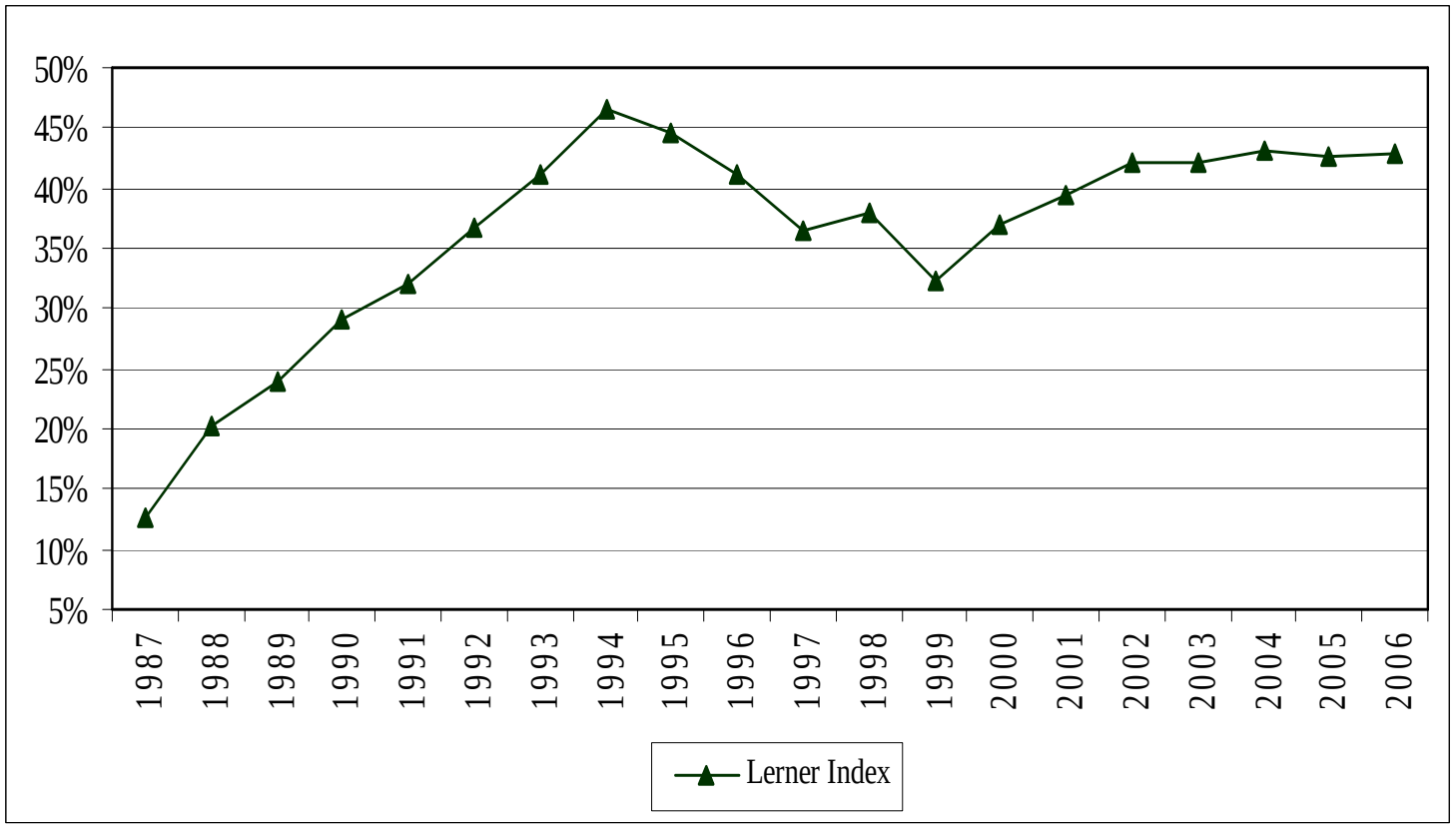
Railroad Market Power – Margin Between RPTM and MC



Trends in Railroad Rates and Market Power

- Recent years' rate increases largely due to declining productivity growth and increasing costs
- Aggregate market power index relatively flat in recent years
  - LMI = (RPTM-MC)/RPTM
- Market power increased most when both MC and RPTM falling

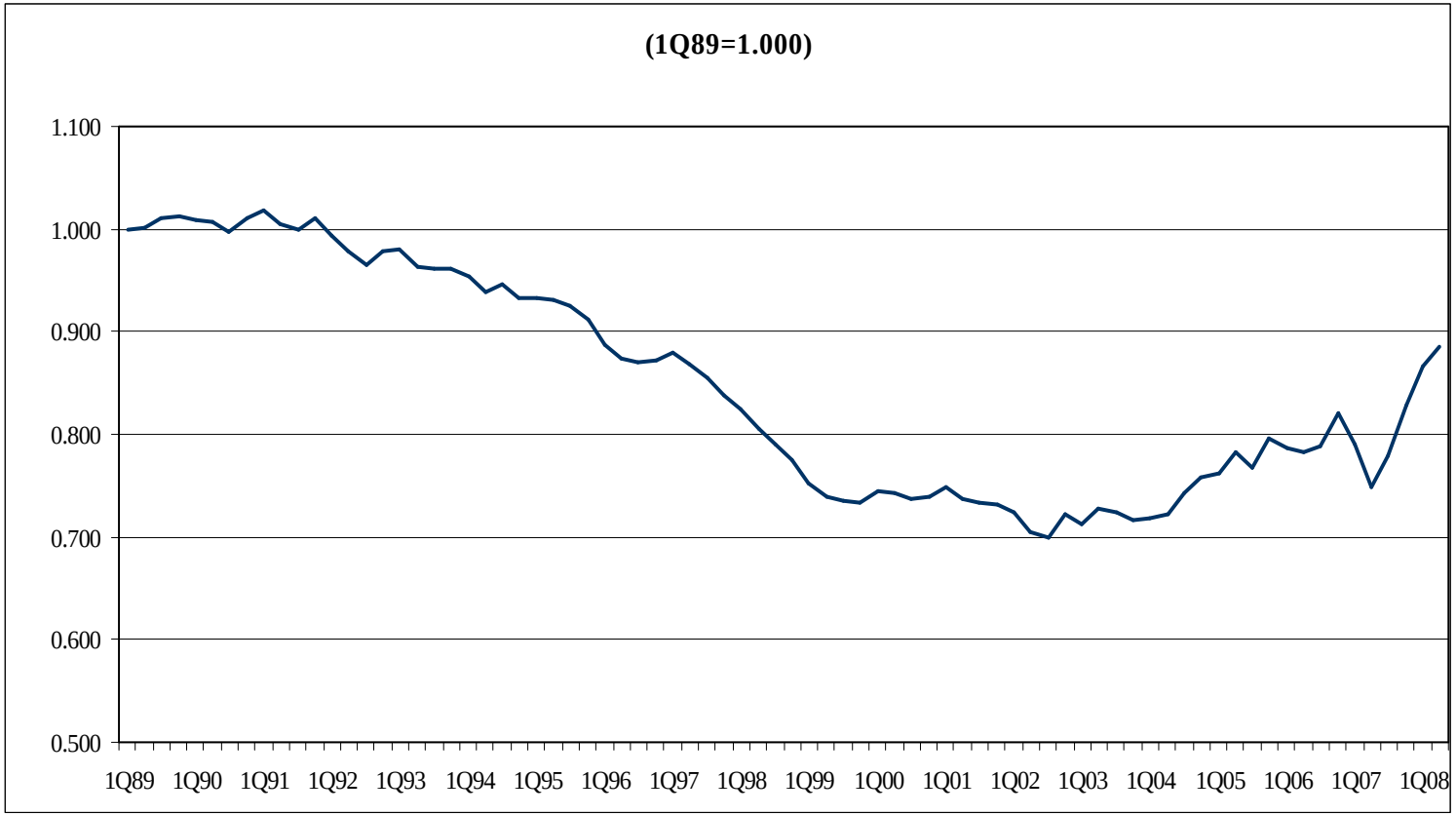
Railroad Market Power – Lerner Index



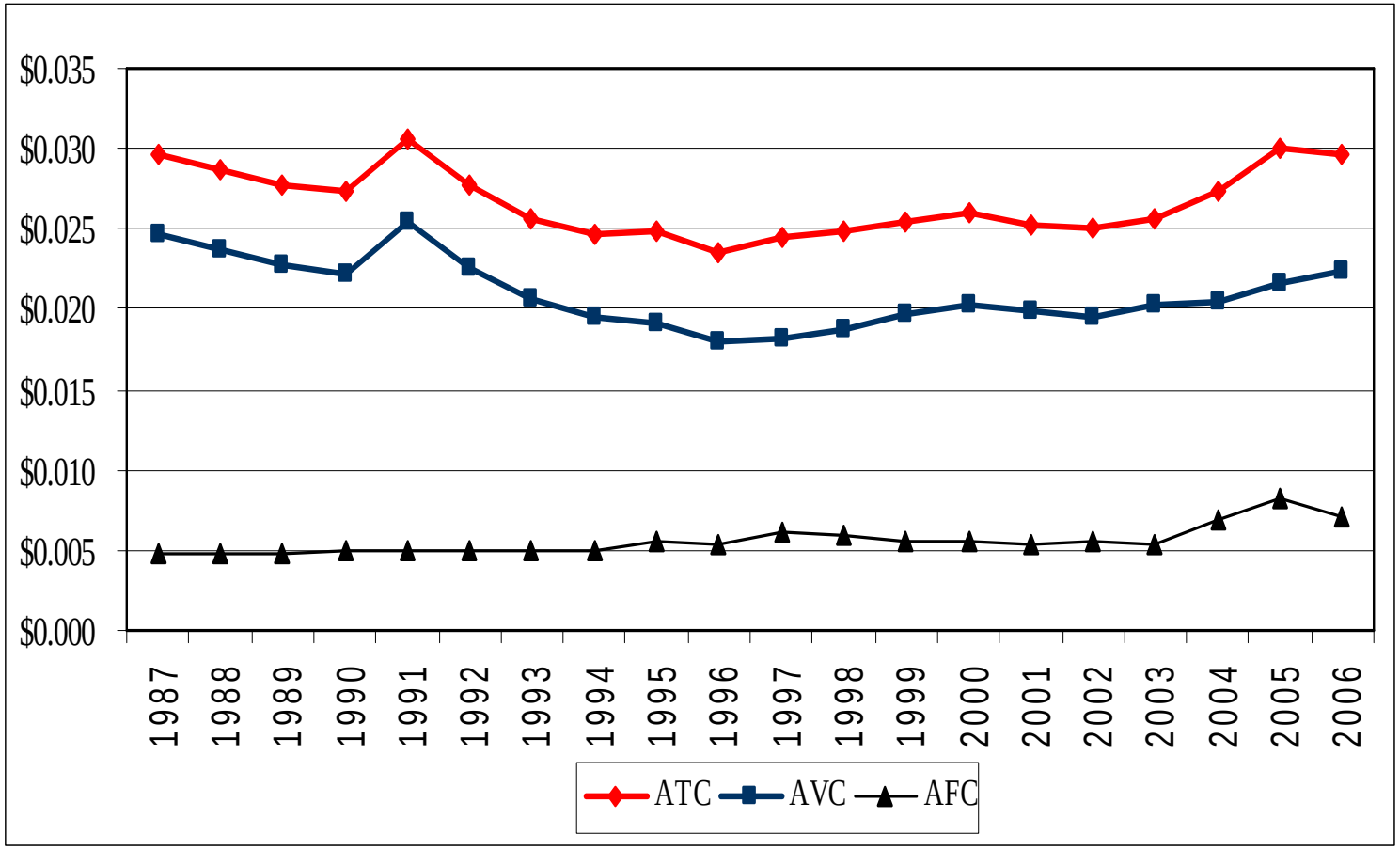
Railroad Productivity and Costs

- Recent declines in productivity growth and increases in input price growth
  - Less ability for railroads to absorb cost increases
  - Reflected in upturn in RCAF-A
- Recent trends in economic costs
  - Fixed costs declining after spike in 2004-05
  - Increases in marginal and variable costs
  - Differences in marginal costs by commodity and over time

Productivity-Adjusted Input Prices – RCAF-A



Railroad Average Costs



Recent Trends in Commodity Rates

- Rates and markups over marginal cost vary by commodity groups and within groups
  - Relatively larger markups for agricultural commodities
- Some ability by shippers to adjust to counteract increases
  - e.g., length of haul, car loadings
  - But what are adjustment costs?
- However, not all shippers can adjust

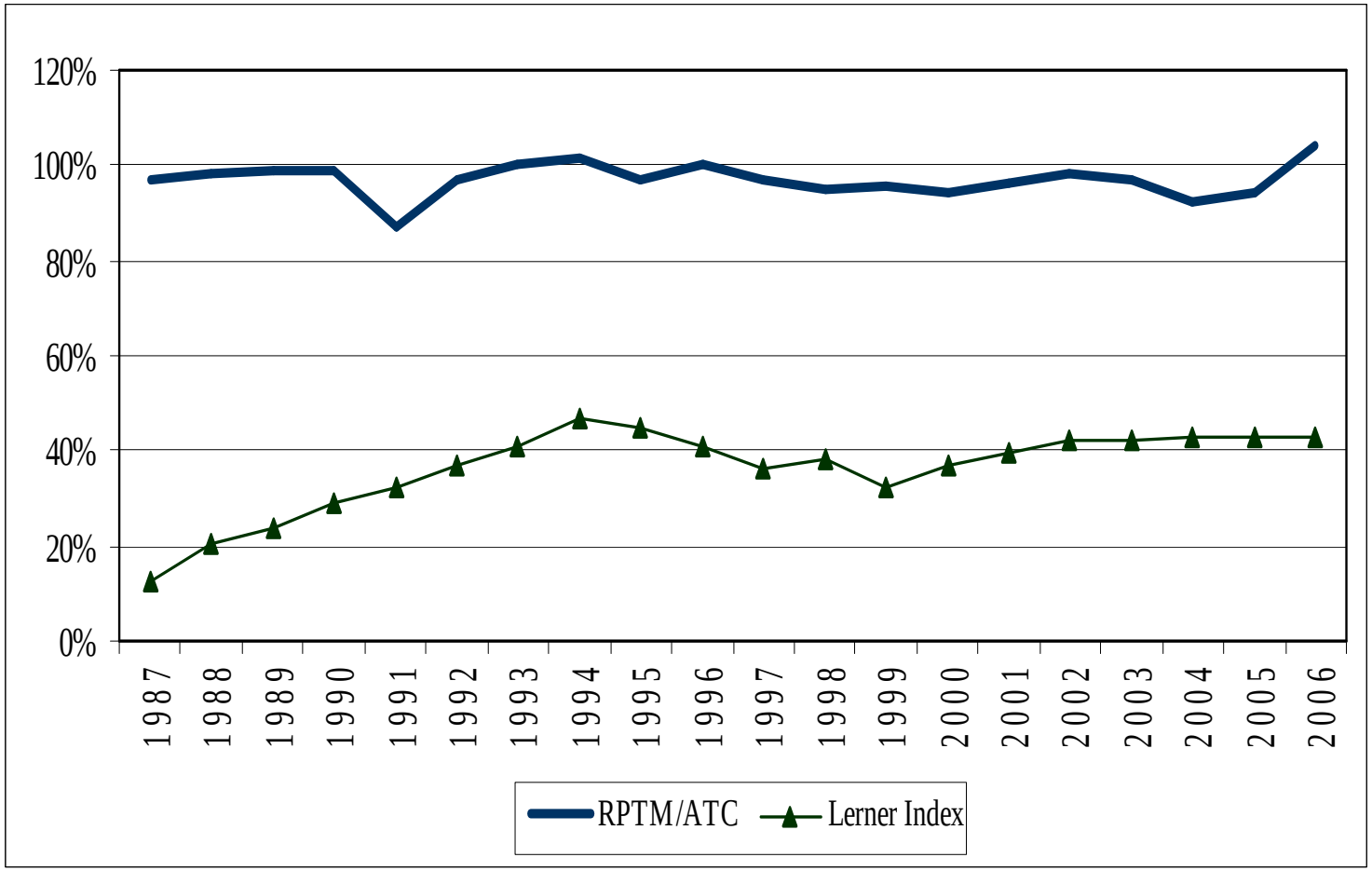
Estimated Marginal Costs and Markups by Commodity

	LMI		Adjusted MC (2000 Q1 cents)	
Commodity	**2001-2003**	**2004-2006**	**2001-2003**	**2004-2006**
Farm Products (Aggregate)	0.61	0.61	0.9	0.9
Barley	0.68	0.75	0.7	0.6
Corn	0.71	0.73	0.7	0.6
Wheat	0.67	0.71	0.8	0.7
Soybeans	0.63	0.58	0.9	1.0
Metallic Ores	0.46	0.51	2.1	2.3
Coal	0.41	0.41	1.1	1.1
Non-metallic Minerals	0.52	0.39	1.8	2.2
Food Products	0.59	0.60	1.2	1.2
Lumber & Wood Products	0.64	0.63	1.4	1.4
Chemicals	0.63	0.59	1.6	1.6
Petroleum & Coal Products	0.64	0.60	1.6	1.5
Clay, Concrete, Glass, & Stone	0.60	0.60	1.7	1.8
Primary Metal Products	0.59	0.59	1.8	2.1
Transportation Equipment	0.55	0.51	5.1	5.4
Intermodal (COFC/TOFC)	-0.36	-0.35	4.3	4.5

Railroad Revenue Sufficiency

- Revenue sufficiency measure = RPTM/ATC
- For most years of study (1987-2006) Class I's do not appear to be earning above normal profit
  - Results vary by railroad
- Financial performance similar to electric utilities
- Does 2006 indicate start of new trend???

Railroad Revenue Sufficiency and Market Power



Railroad Revenue Sufficiency and Market Power

- No increase in exercise of market power in recent years as revenue sufficiency improved
- Greatest increases in market power occurred in late 1980s and early 1990s when industry mostly below and trying to achieve revenue sufficiency levels

Shipper Captivity

- Within commodity groups, shippers with no or limited transportation options pay more than shippers with same shipment characteristics and better transportation alternatives
- R/VC is weakly correlated with market structure factors that affect shipper captivity
  - Not a reliable indicator of market dominance
  - Instances of “relative captivity” when R/VC < 180
  - Percent of R/VC below100 often greater than percent above 300

Correlation of R/VC with Market Factors

	Correlation Coefficient with R/VC Ratio					
Commodity Group	RPTM	Distance to Water (Origin)	Distance to Water (Destination)	Railroad Competition at Origin	Railroad Competition at Destination	Econometric Market Structure Shifter
Chemicals	0.18	-0.03	-0.01	-0.07	0.01	0.06
Coal	0.61	-0.26	0.03	-0.25	-0.13	0.05
Corn	0.23	-0.01	0.09	0.00	-0.06	0.07
Intermodal	0.12	-0.06	0.13	-0.04	-0.20	0.21
Transportation	0.16	-0.18	-0.18	-0.05	-0.02	-0.10
Wheat	0.44	0.09	-0.04	-0.05	-0.02	0.08

Capacity Constraints

- Capacity "tightness" due to localized congestion and constraints
  - Similar to performance of other network industries
  - Econometric and engineering studies say overall networks not constrained
- No evidence of connection between capacity and increased exercise of market power
  - No overall changes in railroad markups during periods of "tightness," but some redistribution
- Capacity lumpiness – hard to achieve optimality
- Future projections must be viewed cautiously

Service Quality

- RPM Train speed data used as proxy
  - These data are a rough, aggregate proxy
- Service performance declines in 2003-2005 period linked to terminal congestion
- Speed and variability by commodity
  - Variability typically greatest for coal and grains, lowest for intermodal
- Better data needed

Economic Analysis of Policy Proposals

- Circumstances (as of 2006) imply providing relief to certain groups will likely result in increases for other shippers or threaten railroad viability
  - Caveat – does 2006 represent a new trend?
- Incremental policies have greater likelihood of resolving shipper issues with lower risk of adverse consequences. For example,
  - Reciprocal switching, terminal agreements
  - Improvements in STB procedures
  - Possibility of encouraging competitive response and expanding "size of pie"
- Some shippers will not benefit from greater competition – continued oversight necessary

Economic Impact of Open Access Proposals

	Reciprocal Switching	Bottleneck Rates	Terminal Agreements	Trackage Rights
Economies of Density	Potential gains	Gains unlikely	Potential gains	Potential gains
Length-of-Haul Economies	Small loss	Potentially large loss	No gain to small gain	No gain to small gain
Vertical Economies	Small loss	Potentially large loss	Small loss	Potentially large loss
Investment Incentives	Small effect	Potentially large effect	Small effect	Potentially large effect
Railroad Profitability	Small effect	Potentially large effect	Small effect	Potentially large effect
Coordination Costs	Small to moderate	Small to moderate	Small to moderate	Potentially large
Competitive Response	Most likely	Least likely	Most likely	Somewhat likely
Shipper Gains	Most likely	Least likely	Most likely	Somewhat likely