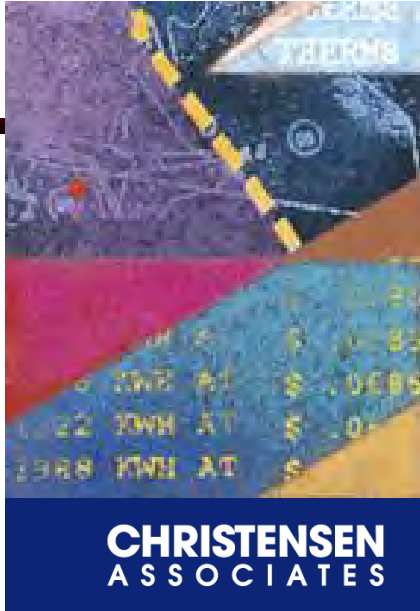


A Study of Competition in the Railroad Industry and Analysis of Proposals that Might Enhance Competition

Summary of Key Findings of the
Christensen STB Studies

*Presented to
TRB Committee for a Study of Freight Rail Transportation and
Regulation*

January 10, 2014



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Project Background

- ❑ The Christensen Associates team was selected by the STB to perform an independent study of competitive issues in the U.S. freight railroad industry
 - Impetus was GAO question of whether there had been abuse of market power by railroads
- ❑ Our original November 2008 report used data through 2006
- ❑ In 2010, we updated our report with data through 2008
 - The basic findings and conclusions from our original study remain

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
 - Almost all firms exercise market power
- Railroads use differential pricing to recover their total costs - how competitive markets work
 - Different commodity groups and shippers face different markups of rates over marginal costs
 - Captive shippers protected by the regulatory process

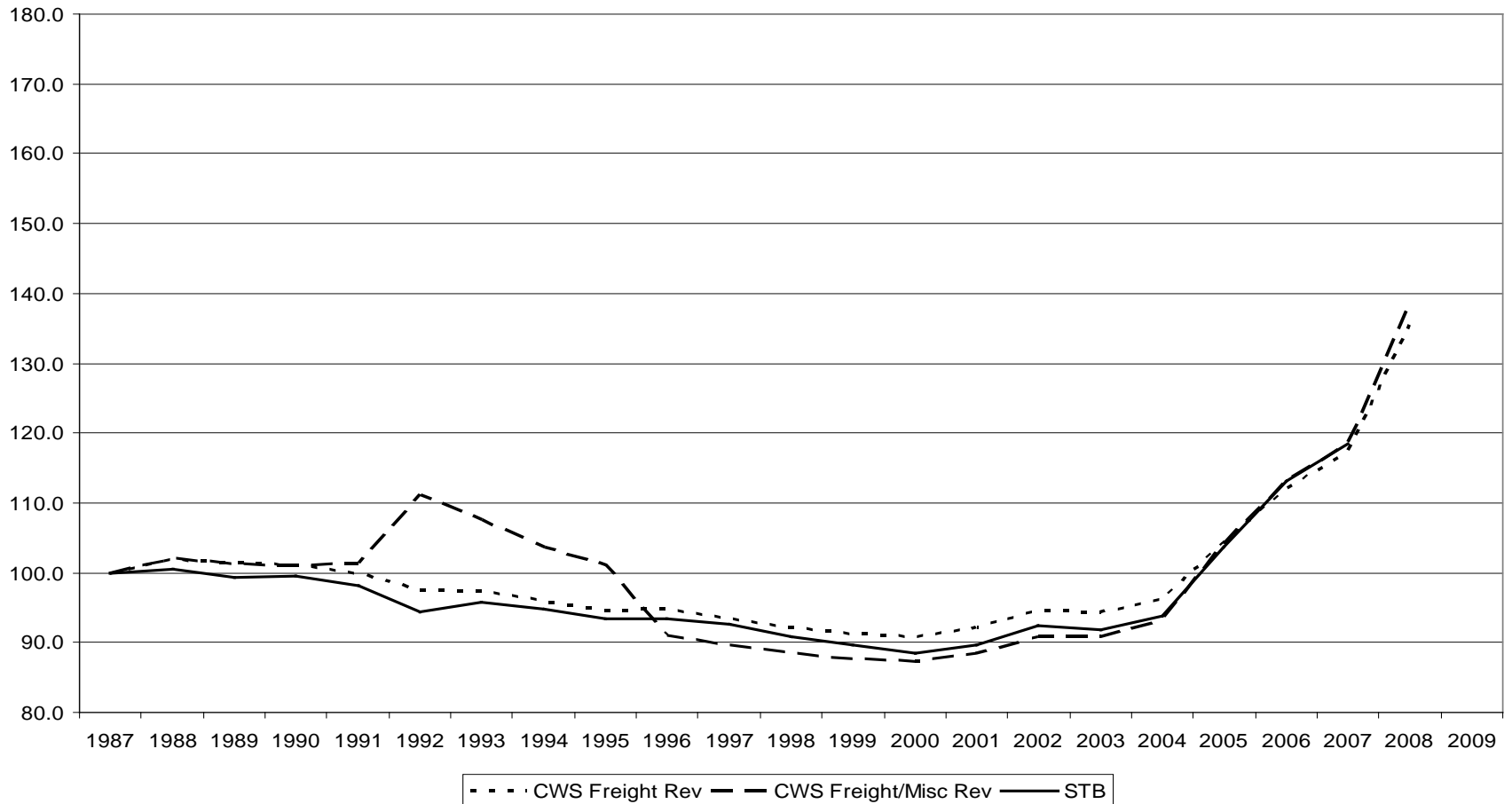
Trends in Railroad Rates

- ❑ Overall, rates have been increasing since 2004, with steep increases in 2008
- ❑ What are the reasons for this? Our analysis concluded that:
 - Recent years' rate increases due to declining productivity growth and increasing costs, not increased exercise of market power
 - Input costs increased faster than productivity growth, resulting in unit cost increases
 - Increases in fuel prices drove the input cost increases

Overall Railroad Rates Indexes

1987-2008

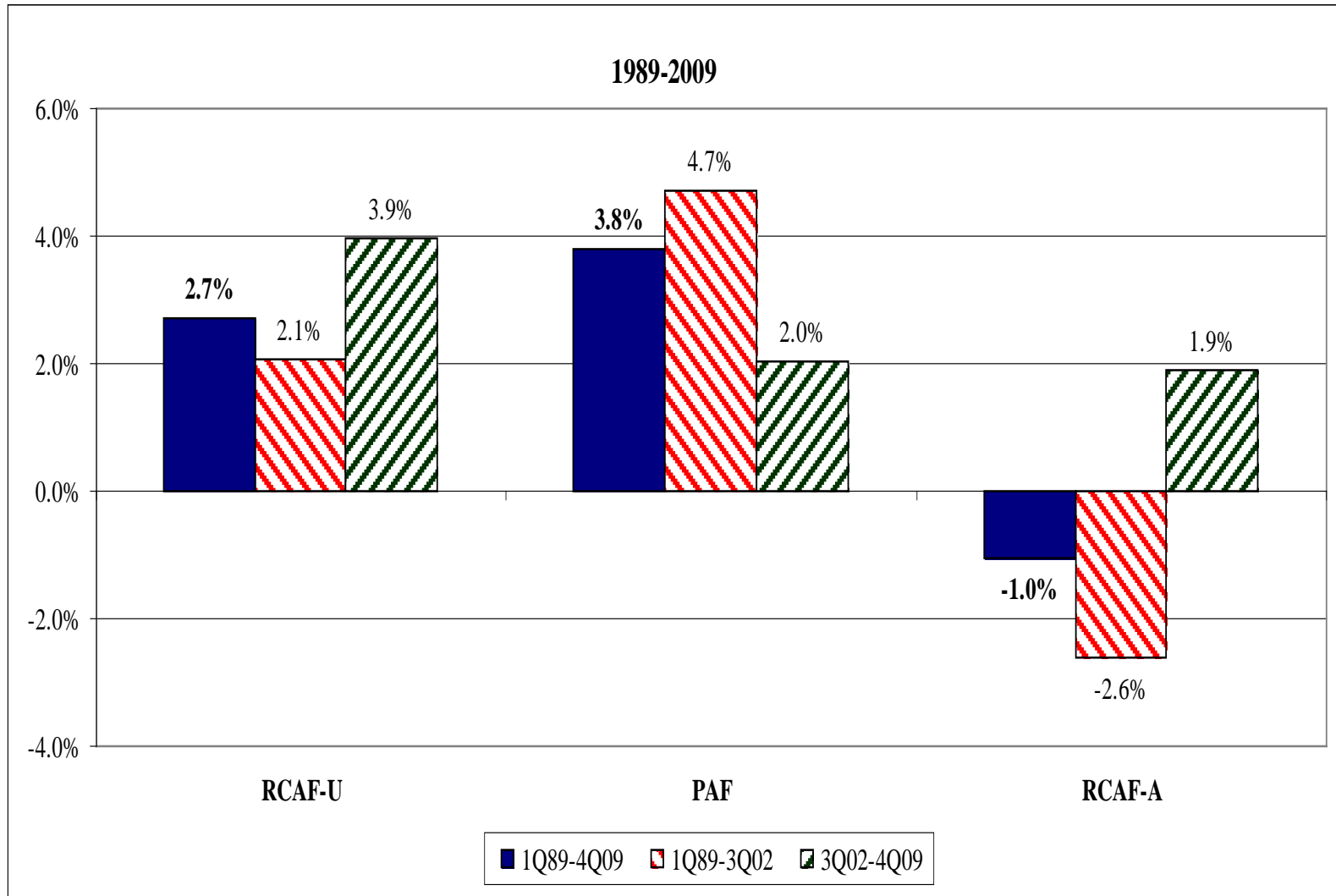
(1987=100.0)



Railroad Productivity and Input Costs

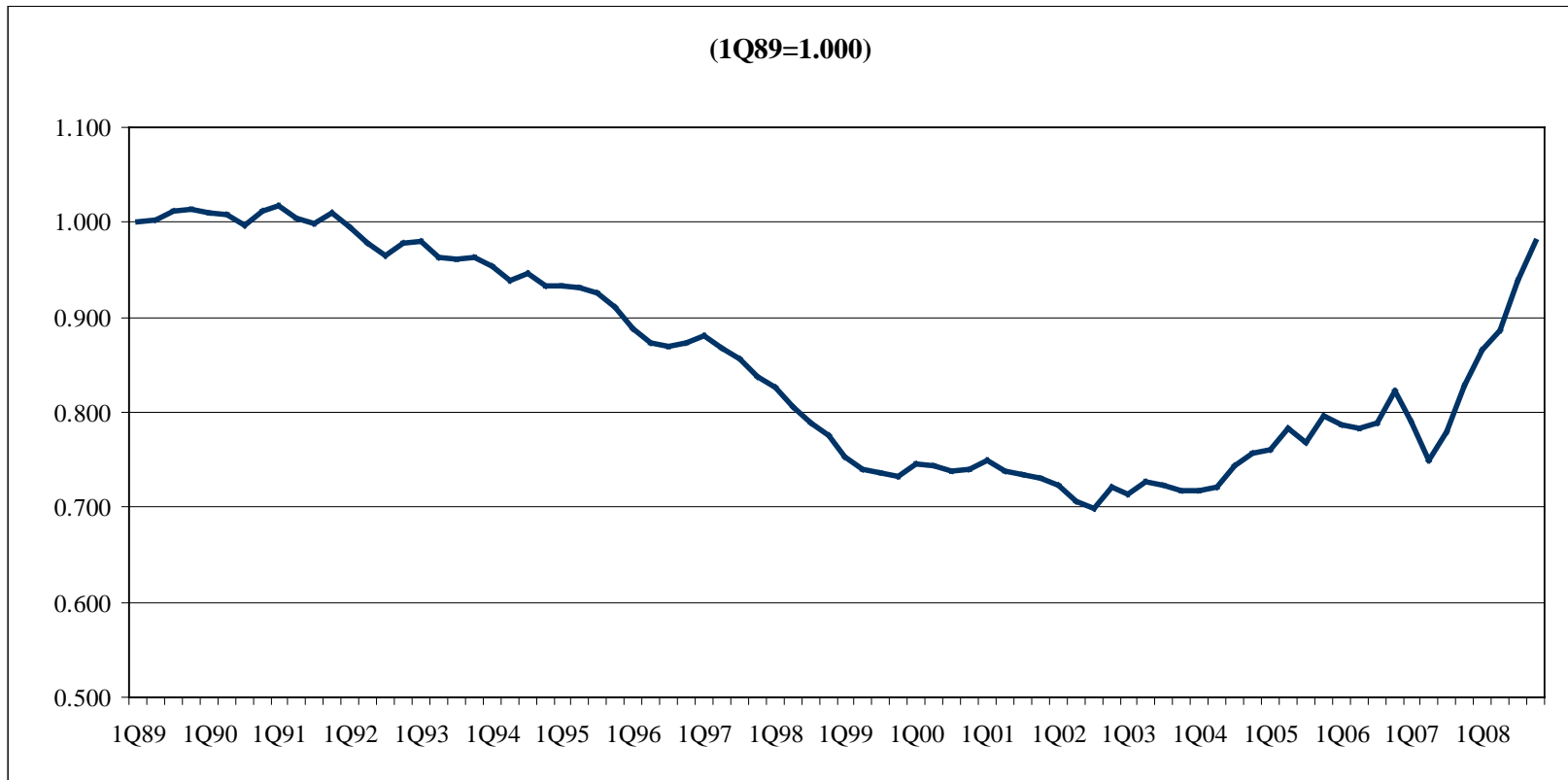
- ❑ The STB's rail cost adjustment factor (RCAF) provides measures of productivity and input costs
 - RCAF-U: RCAF unadjusted for productivity gains, a measure of input prices
 - PAF: the RCAF productivity adjustment factor
 - RCAF-A: RCAF adjusted for productivity gains, a measure of unit costs
- ❑ Recent declines in productivity growth (PAF) and increases in input price growth (RCAF-U) translate into unit cost increases (RCAF-A)
 - Less ability for railroads to absorb cost increases
- ❑ Timing of RCAF-A increases coincident with rate increases

Railroad Costs and Productivity



RCAF-A Measure of Unit Costs

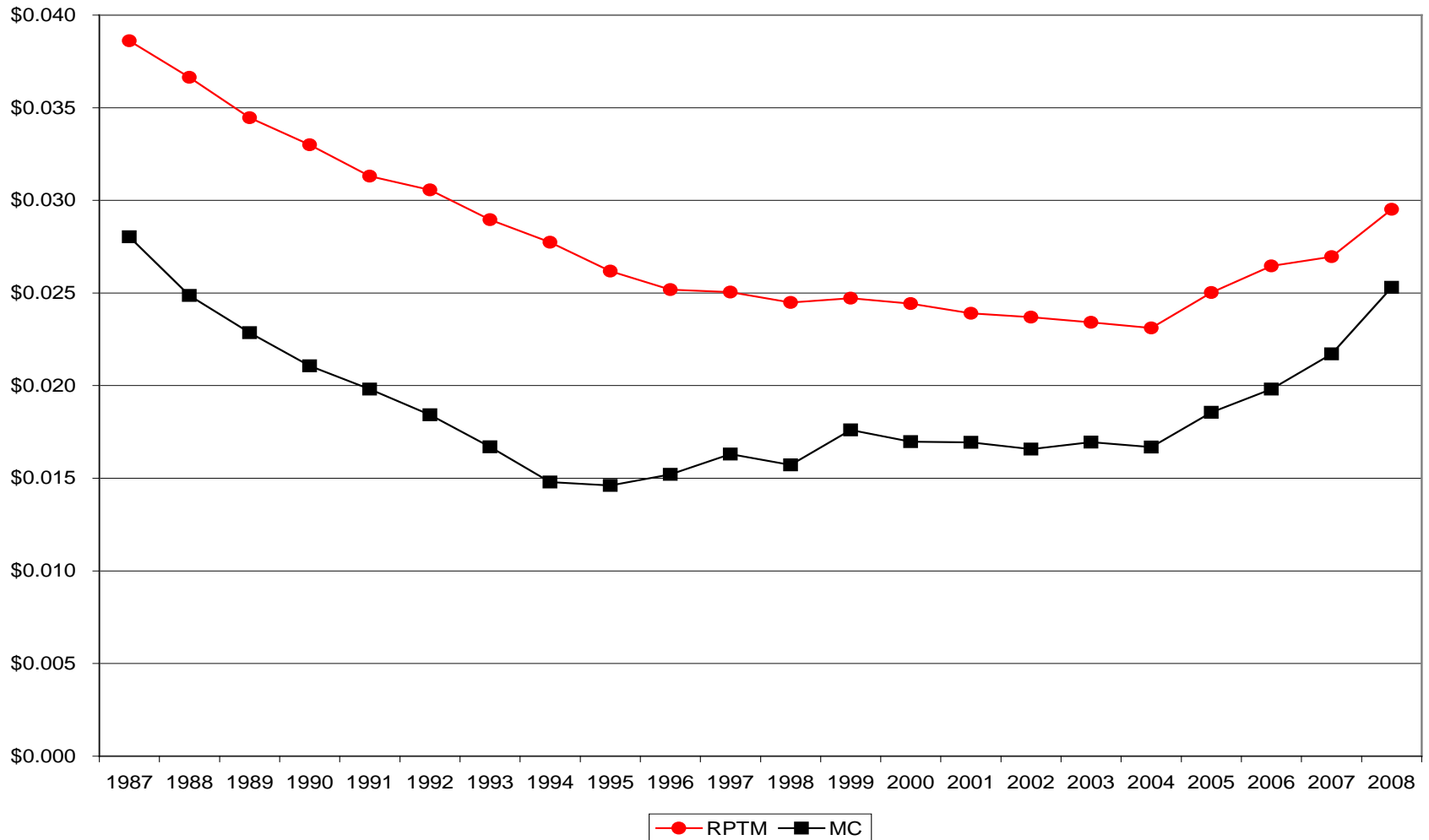
1989-2008



Comparison of Railroad Prices and Costs

- Increases in average and marginal costs in recent years
 - Our estimates are consistent with the RCAF cost and productivity trends
 - Differences in marginal costs by commodity and over time
- Marginal costs have been increasing faster than prices in recent years
 - Aggregate prices represented by revenue per ton-mile (RPTM)

Industry Revenue and Marginal Cost per Ton-Mile (Year 2000 Dollars)



Changes in Real RPTM and Cost Variables

	2002	2003	2004	2005	2006	2007	2008
Revenue Per Ton-Mile	-0.90%	-1.16%	-1.29%	8.26%	5.73%	1.89%	9.48%
Marginal Cost	-2.15%	2.27%	-1.54%	11.18%	6.80%	9.59%	16.51%
<i>Average Variable Cost</i>	<i>-3.09%</i>	<i>1.45%</i>	<i>-1.72%</i>	<i>2.40%</i>	<i>0.63%</i>	<i>1.85%</i>	<i>7.97%</i>
<i>Average Fixed Cost</i>	<i>-0.37%</i>	<i>-3.43%</i>	<i>22.76%</i>	<i>17.08%</i>	<i>-17.45%</i>	<i>12.84%</i>	<i>5.36%</i>
Average Total Cost	-2.52%	0.41%	3.32%	5.99%	-4.25%	4.41%	7.31%

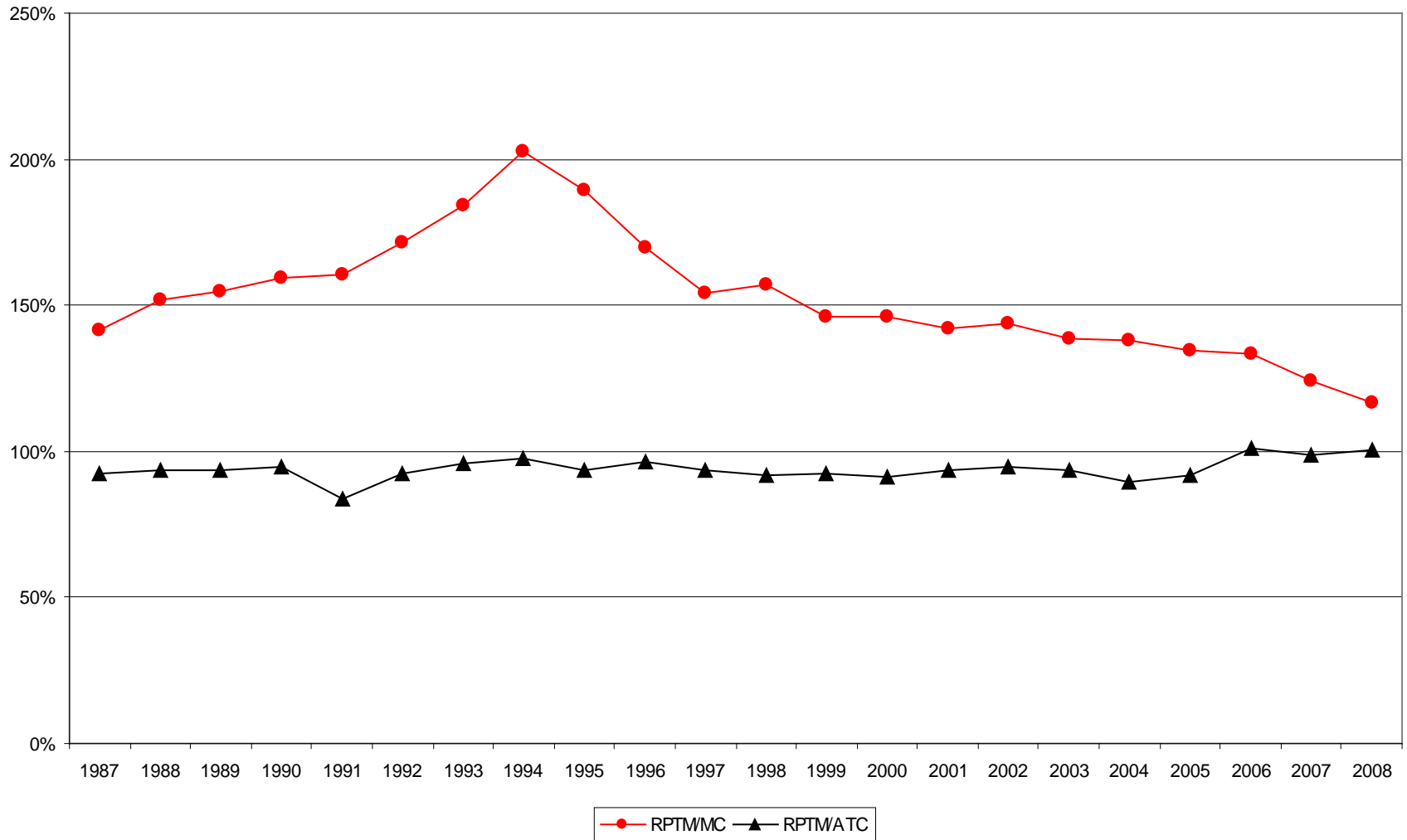
Railroad Revenue Sufficiency

- ❑ Revenue sufficiency, our measure of railroad profitability = $RPTM/ATC$
 - RPTM = revenue per ton-mile
 - ATC = average total costs (includes return on equity)
- ❑ $RPTM/ATC = 100\%$ means “normal” profits earned, no excess or monopoly profits
- ❑ For most years of study (1987-2008) Class I’s did not earn a normal profit, let alone above a normal profit
- ❑ Profitability has improved, but not to an excess
 - Around or slightly greater than 100% in more recent years, achieving a goal of Staggers Act
 - Results vary by railroad
 - No persistent excess profits

Railroad Revenue Sufficiency and Market Power

- ❑ Railroad industry marginal cost has been increasing at a faster average annual rate than railroad revenue per ton-mile
 - Consequently, the measure of railroad market power—the markup of price over marginal cost—has been decreasing
 - Greatest increases in market power occurred in late 1980s and early 1990s when industry mostly below and trying to achieve revenue sufficiency levels
- ❑ 2007 and 2008 Carload Waybill Sample data show lower shares of tons and ton-miles moving at rates exceeding 180 percent of URCS variable cost (i.e., R/VC) than in 2005 and 2006

Industry Markup Ratio and Revenue Sufficiency



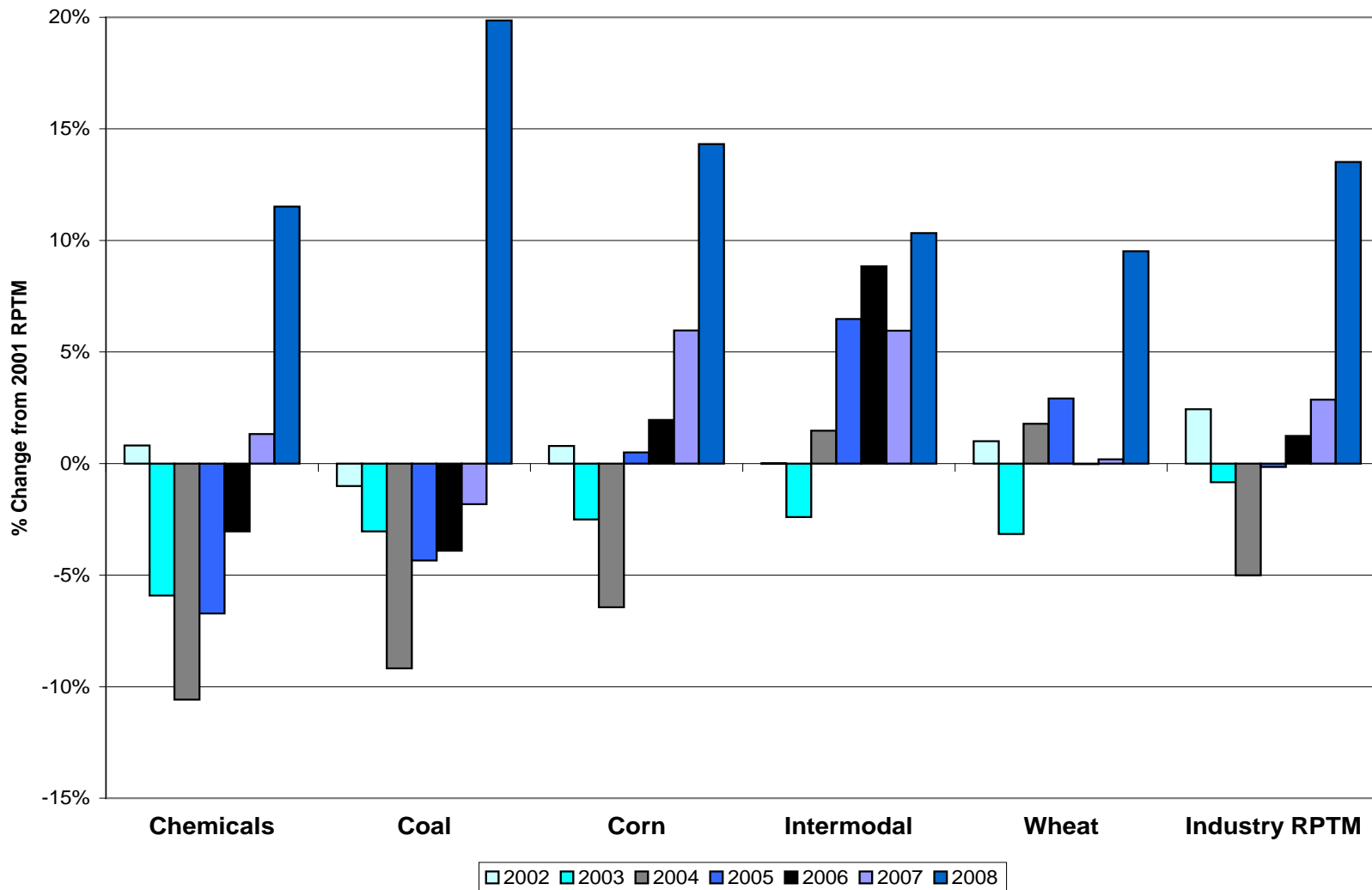
Ton-Miles by R/VC Category

Period	R/VC < 100	R/VC Between 100 and 180	R/VC Between 180 and 300	R/VC > 300	Subtotal R/VC > 180
	Percent	Percent	Percent	Percent	Percent
2001-2002	22%	56%	19%	2%	21%
2003-2004	21%	57%	17%	5%	22%
2005-2006	29%	52%	16%	4%	20%
2007	33%	50%	15%	2%	17%
2008	34%	49%	14%	3%	17%

Trends in Commodity Rates

- ❑ Percentage increases in revenue per ton-mile have not been uniform across commodities
 - Coal and chemicals experiencing above average increases for 2007-2008
- ❑ Markups over marginal cost vary by commodity groups and within groups
 - Relatively larger markups for agricultural commodities
- ❑ In general, commodity markups declining over time
 - Reflects the fact that costs rising faster than prices

Trends in Real Revenue per Ton-Mile by Commodity



Markup Indexes by Commodity

Commodity Group	LMI		
	2001-03	2004-06	2007-08
<i>Farm Products</i>	0.55	0.54	0.45
<i>Barley</i>	0.68	0.69	0.50
Corn	0.68	0.68	0.62
Wheat	0.64	0.68	0.58
<i>Soybeans</i>	0.56	0.56	0.47
<i>Metallic Ores</i>	0.32	0.26	0.36
Coal	0.31	0.35	0.25
<i>Nonmetallic Minerals</i>	0.41	0.27	0.44
<i>Food Products</i>	0.50	0.48	0.40
<i>Lumber or Wood Products</i>	0.54	0.53	0.36
Chemicals	0.55	0.47	0.45
<i>Petroleum or Coal Products</i>	0.55	0.56	0.52
<i>Clay, Concrete, Glass, or Stone Products</i>	0.51	0.51	0.43
<i>Primary Metal Products</i>	0.44	0.42	0.41
<i>Transportation Equipment</i>	0.38	0.25	0.20

Policy Analysis

- ❑ Our directive was to analyze, not advocate potential policy changes
 - Analysis was based on economic efficiency considerations
- ❑ We analyzed major policy changes proposed around the time of the study, including
 - Bottleneck rates
 - Trackage rights
 - Terminal agreements
 - Reciprocal switching

Policy Analysis

- ❑ “Incremental Policies”
 - Relatively less costly in terms of efficiency losses
 - In absolute terms, costs may exceed benefits of incremental policy changes
- ❑ “Devil is in the Details”
 - Major detail often not addressed is access rates – our analysis assumed rates that would result from voluntary negotiations
 - Operational issues were not explicitly considered – could be considered an efficiency cost
- ❑ “Pushing on a Balloon”
 - Stakeholder winners and losers
 - Shippers vs. railroads
 - Shippers vs. shippers

Conclusions

- ❑ The impetus of our study was the GAO question of whether there had been an abuse of market power by the railroads
 - Our answer was no
- ❑ Rates steadily increased between 2004-08
 - Mixed results by commodity
- ❑ Since 2004, input costs increased faster than productivity, leading to unit cost increases
 - Most commodity markups have decreased despite rate increases
- ❑ Industry has been approximately revenue sufficient in recent years, no persistent excess profits
- ❑ Staggers Act has worked well for both shippers and railroads