



Operating Ratio As A Measure of Railway Operating Efficiency

Presentation to the CTRF

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Introduction

- 2012 - 2016: CP reduces its Operating Ratio (OR) significantly
 - Coincides with implementation of “Precision Railroading”
- Commentary often attributes decreased OR to operating efficiency
 - “CP and CN have been very successful in lowering their operating ratios and now are among the most efficient railways in the world”
- Many factors contribute to decreasing OR

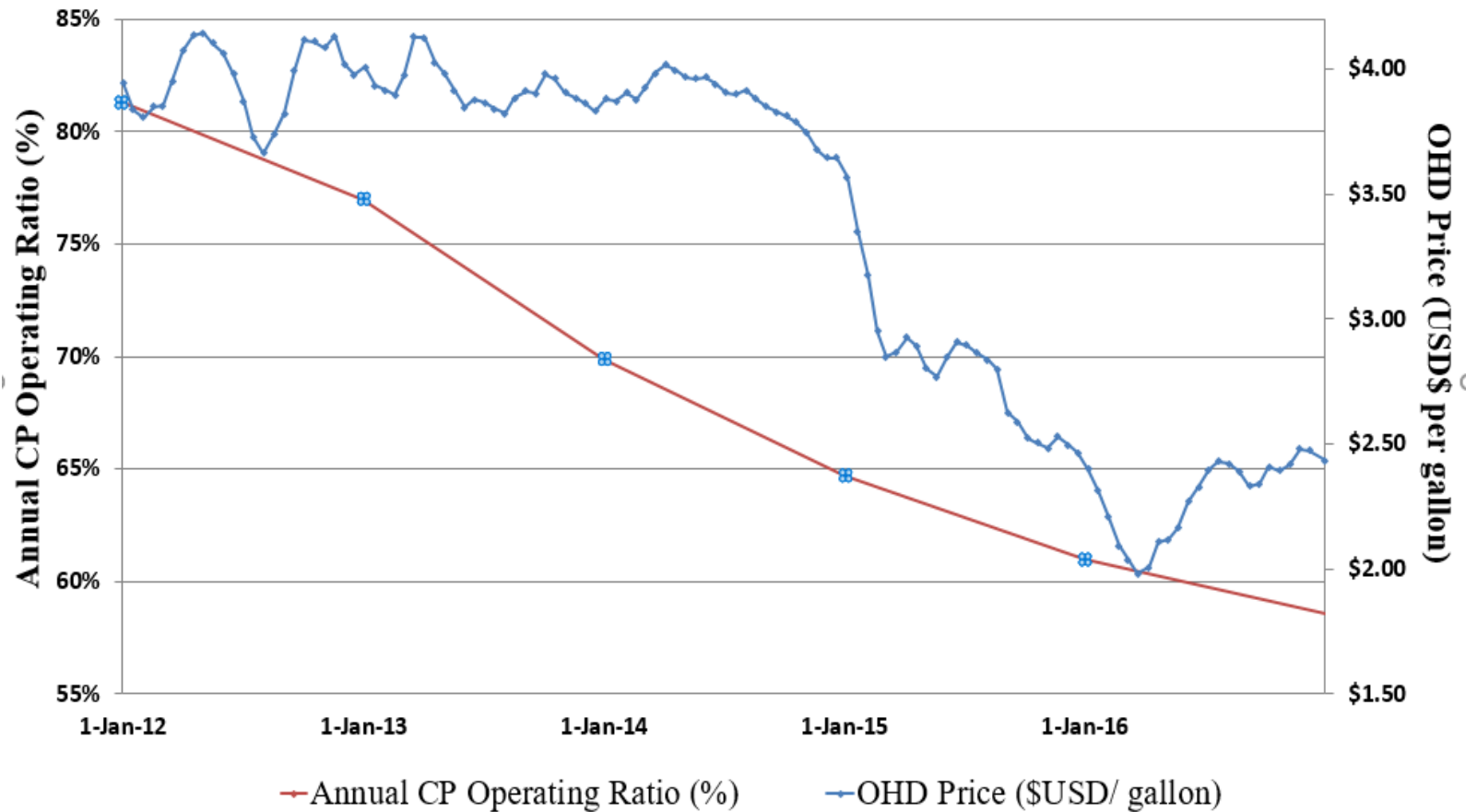
Operating Ratio

- Operating Ratio = Operating Costs/Revenue
- Lower OR means less operating cost per \$ of revenue
 - CP in 2012: 83.3% (adjusted OR = 77.0%)
 - CP in 2016: 58.6%

CP Operating Expenses (2012 – 2016)

- CP's operating expenses per revenue tonne mile (RTM) decreased
 - 2012: ~3.51 cents per RTM (CRTM)
 - 2016: ~2.69 CRTM
 - Decrease of ~24%
- CP tariff 9700 passes through to shippers CP's fuel (OHD) costs
- OHD prices declined significantly from 2012 to 2016

Fuel (OHD) Prices vs CP Operating Ratio



Fuel, con't

- CP's operating expense per RTM less fuel expenses
 - 2012: ~2.77 CRTM
 - 2016: ~2.27 CRTM
 - Decrease of ~18% (was 24% inclusive of fuel)
- Fuel expenses also impacted by fuel efficiency of locomotives

% Change in Components of CP's Operating Expenses (2016 vs. 2012)

Component of CP's Operating Expenses	% Change In Expense Per RTM (2016 vs 2012)	% of CP Total Operating Expenses (2016)
Compensation and benefits	-21.6%	33%
Materials	-24.9%	5%
Equipment rents	-16.6%	5%
Depreciation and amortization	+17.9%	17%
Purchased services and other	-4.4%	25%
Fuel	-43.6%	15%
Total Operating Expenses	-23.5%	100%

Fuel, con't

- CP fuel consumption
 - 2012: ~1.15 gallons per 1,000 GTM
 - 2016: ~0.98 gallons per 1,000 GTM
 - Decrease of ~15%
- CP's did not pass along efficiency gains
 - FSC tariff 9700 remained substantially unchanged
 - Rates continued to go up

Impact of OHD Prices on CP's OR (2016 vs. 2012)

Component	2012	2016	2016 (had 2012 OHD prices applied)
Gross ton-miles (millions) (as reported by CP)	254,354	242,694	242,694
Fuel consumption (U.S. gallons consumed per 1,000 GTM) (as reported by CP)	1.15	0.98	0.98
Fuel consumed (U.S. gallons) (calculated)	292,507,100	237,840,120	237,840,120
Fuel expenses (C\$ millions) (as reported by CP)	\$999	\$567	\$812
Locomotive fuel price (C\$/gallon) (calculated)	\$3.42	\$2.38	\$3.42
Fuel expense differential due to fuel prices (C\$ millions) (calculated)	N/A	N/A	\$245
Total operating expenses (C\$ millions) (as reported by CP)	\$4,746	\$3,654	\$3,899
Total Revenue (C\$ millions) (as reported by CP)	\$5,695	\$6,232	\$6,477
Operating Ratio	83.3%	58.6%	60.2%

Freight Rate Increases

- Despite a reduction in operating expenses, CP's freight revenues per RTM increased from 2012 to 2016
 - 8.5% increase (unadjusted)
- CP's increase in freight revenues are even more striking when one removes the confounding impact of changes in fuel expenses

CP Rail Freight Revenue per RTM (2012 vs 2016, w/ and w/out fuel, w/ and w/out traffic normalization to 2012)

Period	Rail Freight Revenue per RTM (reported) (CRTM)	Rail Freight Revenue per RTM (excl. fuel, calculated) (CRTM)
2012	4.11	3.37
2016	4.46	4.04
% Change (2016 vs 2012 –not normalized)	8.5%	19.9%
2016 (normalized to 2012 traffic mix by % RTMs)	4.59	4.18
% Change 2012 to 2016 (normalized to 2012 traffic mix by % RTMs)	11.8%	23.9%

CP Did Not Pass Along Productivity Improvements

- Increasing revenue per RTM contributes to a reduction in CP's OR
 - If CP had passed along its productivity gains to shippers, its 2016 OR would have been higher
- Can approximate CP freight revenue in 2016 by adjusting its 2012 revenue by year over year change in RCAF-A
 - RCAF-A measures inflation in railway inputs (*e.g.* labour, fuel), modified for productivity gains

Hypothetical Impact of Reduced Rail Freight Rates on CP's Operating Ratio Using RCAF-A

	CP 2016 (as reported) (C\$ billions)	CP 2016 (if 2012 Rail Freight Revenue Indexed to RCAF-A) (C\$ billions)
Rail Freight Revenue	\$6.06	\$4.86
Total Revenue	\$6.23	\$5.03
Operating Expenses	\$3.65	\$3.65
Operating Ratio	58.6%	72.6%

Conclusions

- Be cautious in considering OR as evidence of railway efficiency gains
- OR can be significantly affected by
 - Fuel prices
 - Rate increases

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