Alternatives to URCS Appendices

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R1 Schedule	Line Number	URCS Dependent Variable	Description	New Dependent Variable
410	501	CAREXP	CLEANING CAR INTERIORS	CAREXPS
410	502	CAREXP	ADJUSTING & TRANSFERRING LOAD-SAL & WAG	CAREXPS
410	503	CAREXP	CAR LOAD DEVICES & GRAINDOORS-SAL & WAG	CAREXPS
410	505	CAREXP	T & YC FRINGES	CAREXPS
410	29	CAROH	SHOP REPAIR-F.C.	CARR_T
410	88	CAROH		CARR_T
410	220	CAROH	FC ADMINISTRATION	CARR_T
410	223	CAROH	FC EQUIPMENT DAMAGED	CARR_T
410	224	CAROH	FC FRINGES	CARR_T
410	225	CAROH	FC CASUALTIES	CARR_T
410	228	CAROH	FC JT FAC RENT-DR	CARR_T
410	229	CAROH	FC JT FAC RENT-(CR)	CARR_T
410	233	CAROH	FC JT FACILITY-DR	CARR_T
410	234	CAROH	FC JT FACILITY-(CR)	CARR_T
410	236	CAROH	FC DISMANTLING	CARR_T
410	900	CAROH		CARR_T
415	6	CARREP	BOX 40 FT	CARR_T
415	7	CARREP	BOX 50 FT	CARR_T
415	8	CARREP	BOX EQUIPPED	CARR_T
415	9	CARREP	GONDOLA PLAIN	CARR_T
415	10	CARREP	GONDOLA EQUIPPED	CARR_T
415	11	CARREP	HOPPER COVERED	CARR_T
415	12	CARREP	HOPPER OT GEN	CARR_T
415	13	CARREP	HOPPER OT SPECIAL	CARR_T
415	14	CARREP	REFRIG MECHANICAL	CARR_T
415	15	CARREP	REFRIG NON MECHANICAL	CARR_T
415	16	CARREP	FLAT TOFC/COFC	CARR_T
415	17	CARREP	FLAT MULTILEVEL	CARR_T
415	18	CARREP	FLAT GENERAL SERVICE	CARR_T
415	19	CARREP	FLAT ALL OTHER	CARR_T
415	20	CARREP	ALL OTHER FC	CARR_T
415	21	CARREP	CABOOSES	CARR_T

R1 Schedule	Line Number	URCS Dependent Variable	Description	New Dependent Variable
415	22	CARREP	AUTO RACKS	CARR_T
415	23	CARREP	MISCELLANEOUS ACCESSORIES	CARR_T
410	413	CLWRCK	CLEARING WRECKS	CLWRCKS2
410	23	GENADM	COMMUNICATION SYSTEMS	GENADM
410	27	GENADM	STATION & OFFICES	GENADM
410	304	GENADM	PASSENGER EQUIPMENT	GENADM
410	305	GENADM	COMPUTERS & DP EQUIP.	GENADM
410	518	GENADM	AS ADMINISTRATION	GENADM
410	519	GENADM	CLERICAL EMPLOYEES	GENADM
410	520	GENADM	COMMUNICATIONS	GENADM
410	521	GENADM	L&D CLAIMS PROCESSING	GENADM
410	522	GENADM	AS FRINGES	GENADM
410	523	GENADM	AS CASUALTIES	GENADM
410	524	GENADM	AS JT FACILITY-DR	GENADM
410	525	GENADM	AS JT FACILITY-(CR)	GENADM
410	526	GENADM	AS OTHER	GENADM
410	601	GENADM	GENERAL OFFICE	GENADM
410	602	GENADM	ACCOUNTING & FINANCE	GENADM
410	603	GENADM	MANAGEMENT SERVICES	GENADM
410	604	GENADM	MARKETING	GENADM
410	605	GENADM	SALES	GENADM
410	606	GENADM	INDUSTRIAL DEVELOPMENT	GENADM
410	607	GENADM	PERSONNEL	GENADM
410	608	GENADM	LEGAL AND SECRETARIAL	GENADM
410	609	GENADM	PUBLIC RELATIONS	GENADM
410	610	GENADM	RESEARCH AND DEVELOPMENT	GENADM
410	611	GENADM	FRINGES	GENADM
410	612	GENADM	OTHER CASUALTIES	GENADM
410	613	GENADM	WRITEDOWN OF UNCOLLECTIBLES	GENADM
410	616	GENADM	G&A JT FACILITY-DR	GENADM
410	617	GENADM	G&A JT FACILITY-(CR)	GENADM
410	618	GENADM	G&A OTHER	GENADM
410	1	MAINTOH	ADMIN TRACK	RMAINT_T
410	2	MAINTOH	ADMIN B&B	RMAINT_T
410	3	MAINTOH	ADMIN SIGNAL	RMAINT_T
410	4	MAINTOH	ADMIN COMMUNICATIONS	RMAINT_T
410	5	MAINTOH	ADMIN OTHER	RMAINT_T
410	20	MAINTOH	ROAD PROPERTY-DAMAGED-O	RMAINT_T
410	24	MAINTOH	ELECTRIC POWER SYSTEMS	RMAINT_T
410	30	MAINTOH	SHOP REPAIR-O.E.	RMAINT_T

R1 Schedule	Line Number	URCS Dependent Variable	Description	New Dependent Variable
410	102	MAINTOH	MISCELLANEOUS BUILDINGS	RMAINT_T
410	109	MAINTOH	ROADWAY MACHINES	RMAINT_T
410	110	MAINTOH	SMALL TOOLS & SUPPLIES	RMAINT_T
410	111	MAINTOH	SNOW REMOVAL	RMAINT_T
410	112	MAINTOH	W&S FRINGES-R	RMAINT_T
410	114	MAINTOH	W&S FRINGES-OTHER	RMAINT_T
410	115	MAINTOH	W&S CASUALTIES-R	RMAINT_T
410	117	MAINTOH	W&S CASUALTIES-OTHER	RMAINT_T
410	124	MAINTOH	W&S-JT FAC RENT-DR-R	RMAINT_T
410	126	MAINTOH	W&S-JT FAC RENT-DR-OTHER	RMAINT_T
410	127	MAINTOH	W&S-JT FAC RENT-(CR)-R	RMAINT_T
410	129	MAINTOH	W&S-JT FAC RENT-(CR)-OTHER	RMAINT_T
410	139	MAINTOH	W&S JOINT FACILITY-DR-R	RMAINT_T
410	141	MAINTOH	W&S JOINT FACILITY-DR-OTHER	RMAINT_T
410	142	MAINTOH	W&S JOINT FACILITY (CR)-R	RMAINT_T
410	144	MAINTOH	W&S JOINT FACILITY (CR)-OTHER-PUR SERVE	RMAINT_T
410	145	MAINTOH	W&S DISMANTLING-R	RMAINT_T
410	147	MAINTOH	W&S DISMANTLING-OTHER	RMAINT_T
410	301	MAINTOH	OE ADMINISTRATION	RMAINT_T
410	307	MAINTOH	WORK & NR EQUIP.	RMAINT_T
410	308	MAINTOH	OE EQUIPMENT DAMAGED	RMAINT_T
410	309	MAINTOH	OE FRINGES	RMAINT_T
410	310	MAINTOH	OE CASUALTIES	RMAINT_T
410	313	MAINTOH	OE JT FAC RENTS-DR	RMAINT_T
410	314	MAINTOH	OE JT FAC RENTS-(CR)	RMAINT_T
410	318	MAINTOH	OE JT FACILITY-DR	RMAINT_T
410	319	MAINTOH	OE JT FACILITY-(CR)	RMAINT_T
410	321	MAINTOH	OE DISMANTLING	RMAINT_T
410	28	RLOCREP	SHOP REPAIR-LOCO	RLOCREP
410	101	RLOCREP	LOCOMOTIVE SERVICING	RLOCREP
410	201	RLOCREP	LOCO ADMINISTRATION	RLOCREP
410	204	RLOCREP	LOCO EQUIPMENT DAMAGED	RLOCREP
410	205	RLOCREP	LOCO FRINGES	RLOCREP
410	206	RLOCREP	LOCO CASUALTIES	RLOCREP
410	209	RLOCREP	LOCO JT FAC RENT-DR	RLOCREP
410	210	RLOCREP	LOCO JT FAC RENT-(CR)	RLOCREP
410	214	RLOCREP	LOCO JT FACILITY-DR	RLOCREP
410	215	RLOCREP	LOCO JT FACILITY-(CR)	RLOCREP
410	217	RLOCREP	LOCO DISMANTLING	RLOCREP

R1 Schedule	Line Number	URCS Dependent Variable	Description	New Dependent Variable
410	411	RLOCREP	SERVICING TRAIN LOCOS	RLOCREP
415	2	RLOCREP	DIESEL LOCOMOTIVES-ROAD	RLOCREP
415	4	RLOCREP	OTHER LOCOMOTIVES-ROAD	RLOCREP
410	6	RMAINT	ROADWAY-RUNNING	RMAINT_T
410	10	RMAINT	BRIDGES-R	RMAINT_T
410	12	RMAINT	TIES-R	RMAINT_T
410	14	RMAINT	RAILS-R	RMAINT_T
410	16	RMAINT	BALLAST-R	RMAINT_T
410	18	RMAINT	ROAD PROPERTY DAMAGED-R	RMAINT_T
410	21	RMAINT	SIGNALS-R	RMAINT_T
410	25	RMAINT	GRADE XINGS-R	RMAINT_T
410	409	RUNFUEL	TRAIN LOCO FUEL	RUNFUEL
410	410	RUNFUEL	TRAIN ELECTRIC POWER	RUNFUEL
410	402	RUNWAGE	ENGINE CREWS	RUNWAGE2
410	403	RUNWAGE	TRAIN CREWS	RUNWAGE2
410	7	SWMAINT	ROADWAY-SWITCHING	SWMAINT
410	11	SWMAINT	BRIDGES-SW	SWMAINT
410	13	SWMAINT	TIES-SW	SWMAINT
410	15	SWMAINT	RAILS-SW	SWMAINT
410	17	SWMAINT	BALLAST-SW	SWMAINT
410	19	SWMAINT	ROAD PROPERTY DAMAGED-SW	SWMAINT
410	22	SWMAINT	SIGNALS-SW	SWMAINT
410	26	SWMAINT	GRADE XINGS-SW	SWMAINT
410	113	SWMAINT	W&S FRINGES-SW	SWMAINT
410	116	SWMAINT	W&S CASUALTIES-SW	SWMAINT
410	125	SWMAINT	W&S-JT FAC RENT-DR-SW	SWMAINT
410	128	SWMAINT	W&S-JT FAC RENT-(CR)-SW	SWMAINT
410	140	SWMAINT	W&S JOINT FACILITY-DR-SW	SWMAINT
410	143	SWMAINT	W&S JOINT FACILITY (CR)-SW	SWMAINT
410	146	SWMAINT	W&S DISMANTLING-SW	SWMAINT
410	421	SWWAGE	SWITCH CREWS	SWWAGE2
410	401	TRANSOH	TRAIN ADMINISTRATION	TRANSOH2
410	414	TRANSOH	TRAIN FRINGES	RUNWAGE2
410	415	TRANSOH	TRAIN CASUALTIES	TRANSOH2
410	416	TRANSOH	TRAIN JT FACILITY-DR	TRANSOH2
410	417	TRANSOH	TRAIN JT FACILITY-(CR)	TRANSOH2
410	418	TRANSOH	TRAIN OTHER	TRANSOH2
410	408	TRNINSP	TRAIN INSPECTION	TRNINSP
410	420	YARDOP	YARD ADMINISTRATION	YARDOP3
410	422	YARDOP	CONTROLLING OPERATIONS	YARDOP3

R1 Schedule	Line Number	URCS Dependent Variable	Description	New Dependent Variable
410	423	YARDOP	YARD AND TERMINAL CLERICAL	YARDOP3
410	424	YARDOP	OPERATING SWITCHES ETC.	YARDOP3
410	425	YARDOP	YARD LOCO FUEL	YARDOP3
410	426	YARDOP	YARD ELECTRIC POWER	YARDOP3
410	427	YARDOP	SERVICING YARD LOCOS	YARDOP3
410	429	YARDOP	CLEARING WRECKS	CLWRCKS2
410	430	YARDOP	YARD FRINGES	SWWAGE2
410	431	YARDOP	YARD OTHER CASUALTIES	YARDOP3
410	432	YARDOP	YARD JT FACILITY-DR	YARDOP3
410	433	YARDOP	YARD JT FACILITY-(CR)	YARDOP3
410	434	YARDOP	YARD OTHER	YARDOP3
415	1	YLOCREP	DIESEL LOCOMOTIVES-YARD	YLOCREP
415	3	YLOCREP	OTHER LOCOMOTIVES-YARD	YLOCREP

APPENDIX B. R-1 EXPENSE AND OUTPUT VISUALIZATIONS

B-1. COMPOSITION OF ECONOMETRIC COST POOL EXPENSES FOR EASTERN AND WESTERN CLASS I RAILROADS

Figure B-1. Composition of Expenses for Eastern Class I Railroads, Legacy URCS Expense Categories

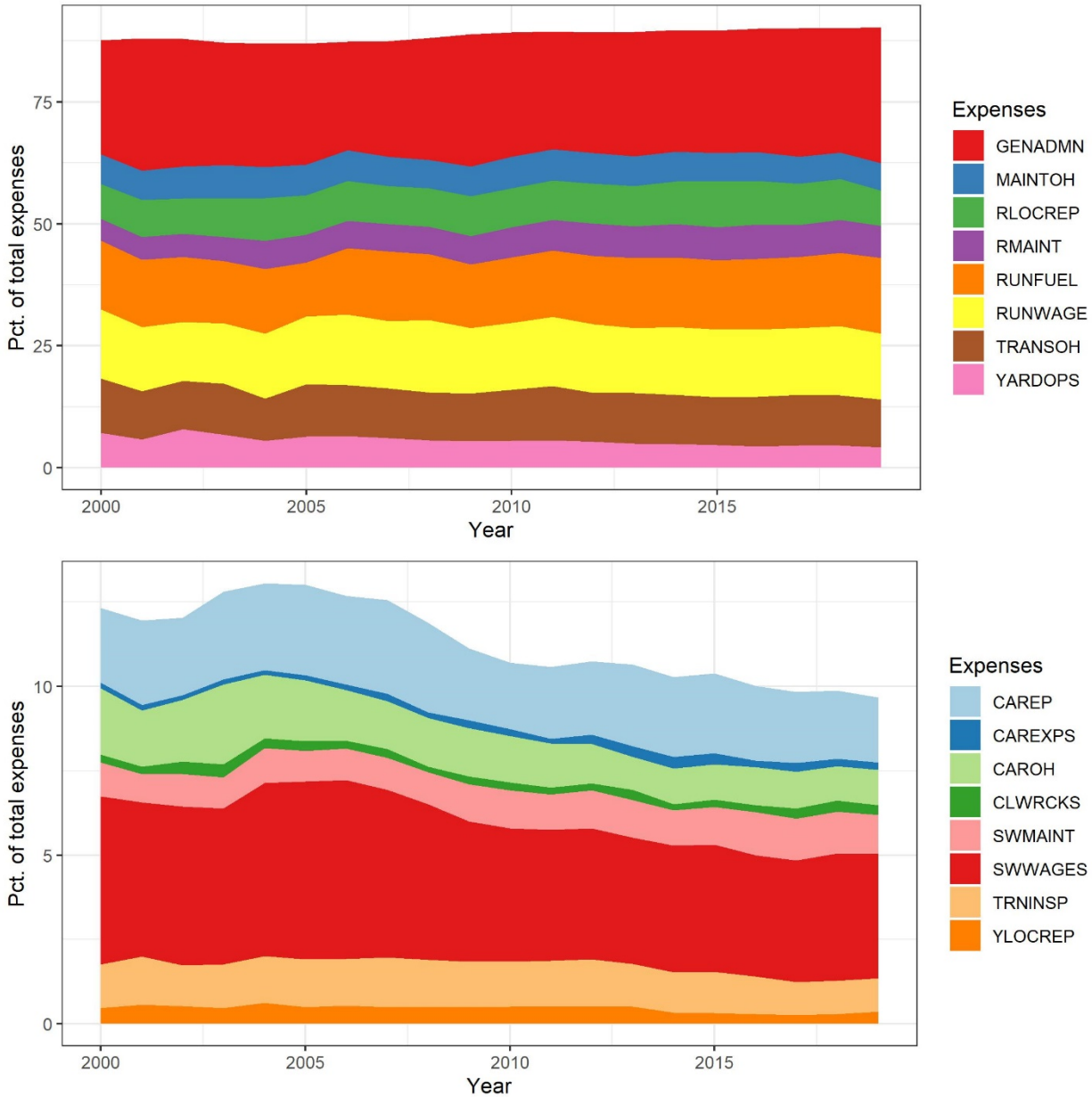


Figure B-2. Composition of Expenses for Eastern Class I Railroads, Updated URCS Expense Categories

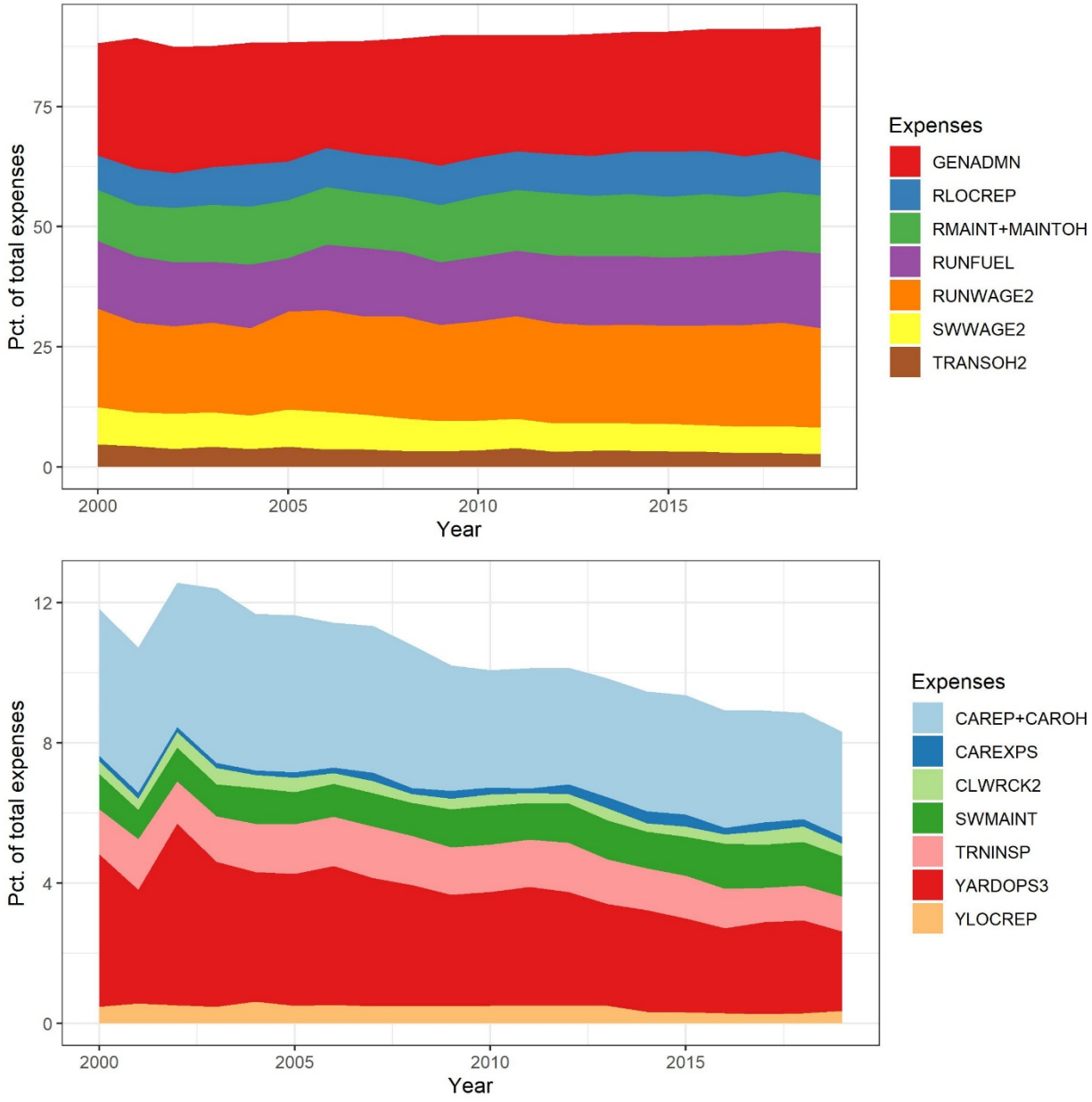


Figure B-3. Composition of Expenses for Western Class I Railroads, Legacy URCS Expense Categories

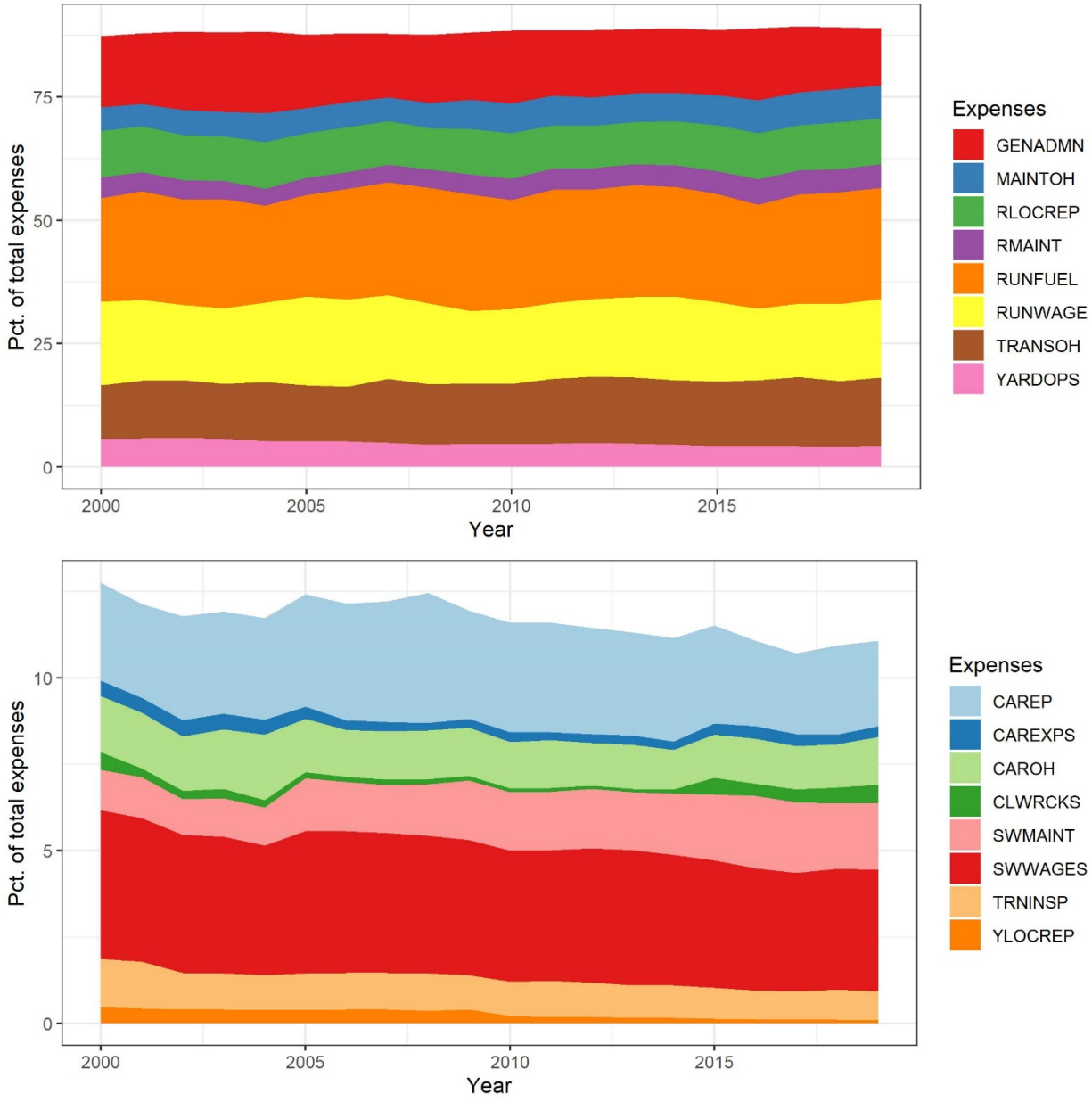
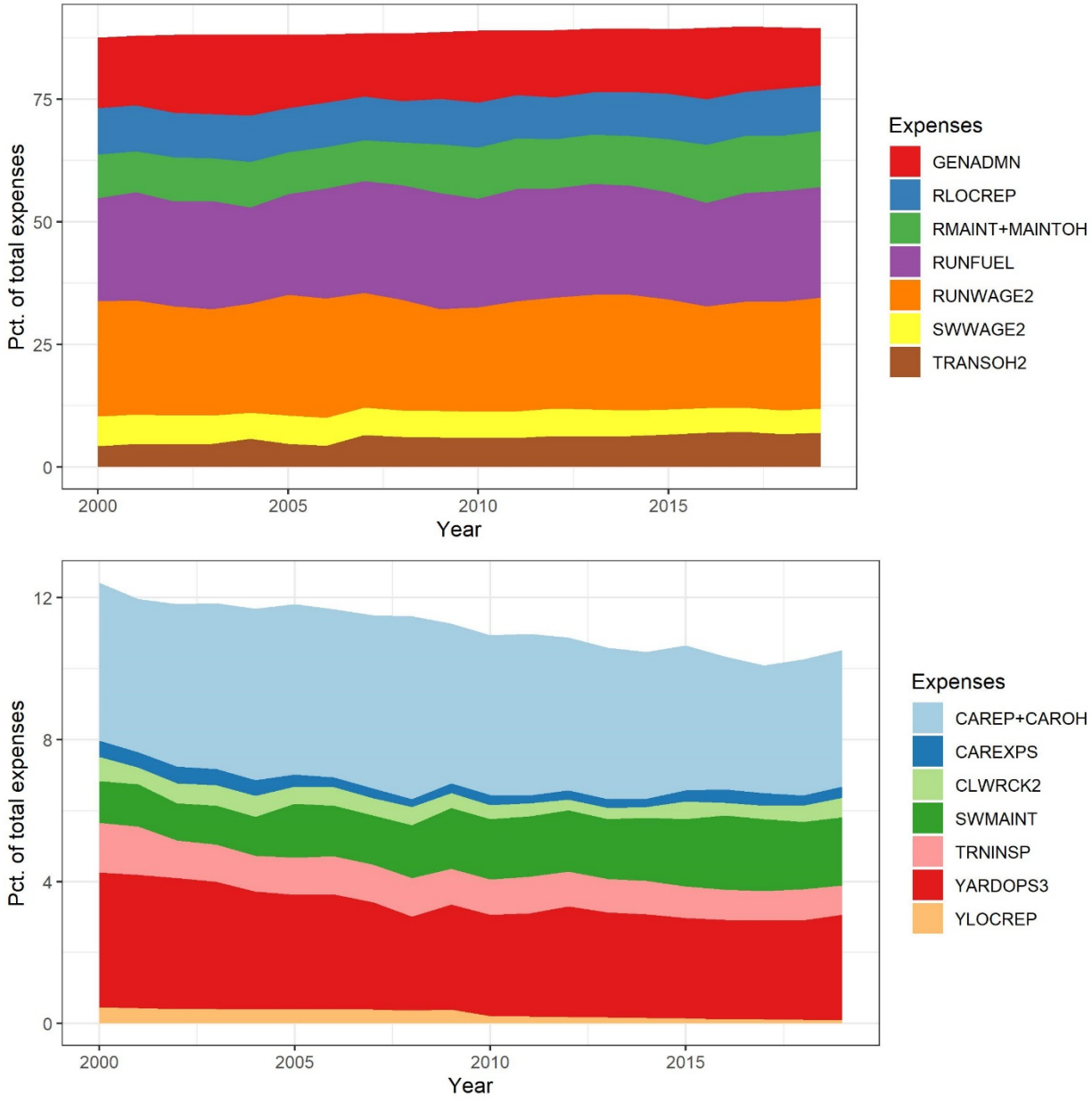


Figure B-4. Composition of Expenses for Western Class I Railroads, Legacy URCS Expense Categories



B-2. Plots of Expenses Versus Outputs, Legacy and Updated Cost Pools

Figure B-5. RMAINT versus GTMC

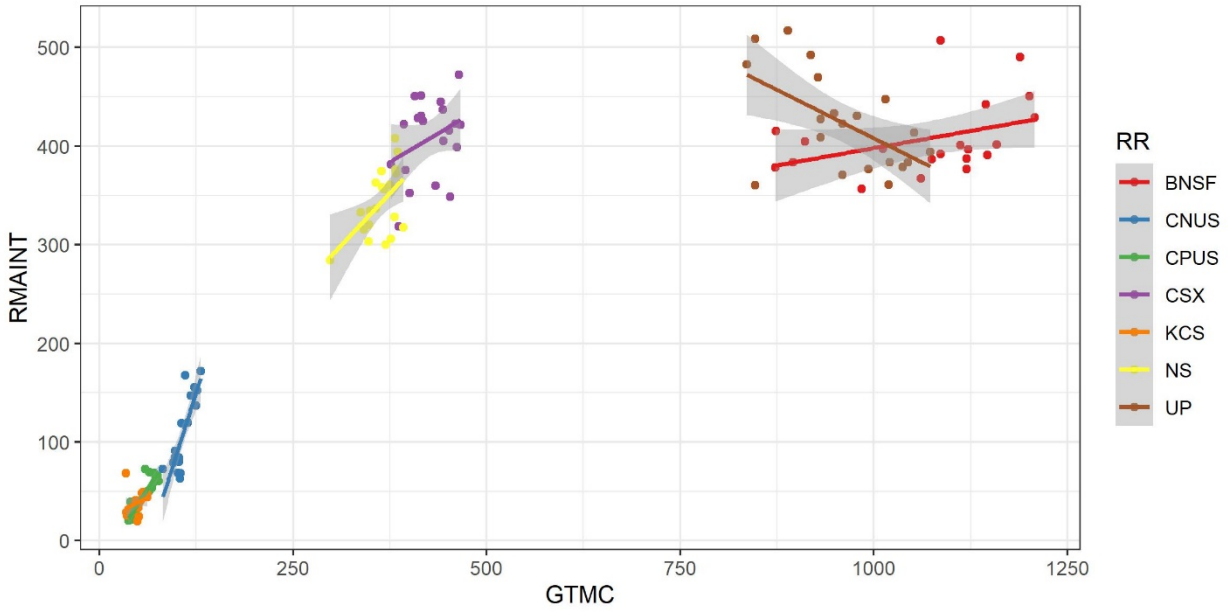


Figure B-6. MAINTOH versus GTMC

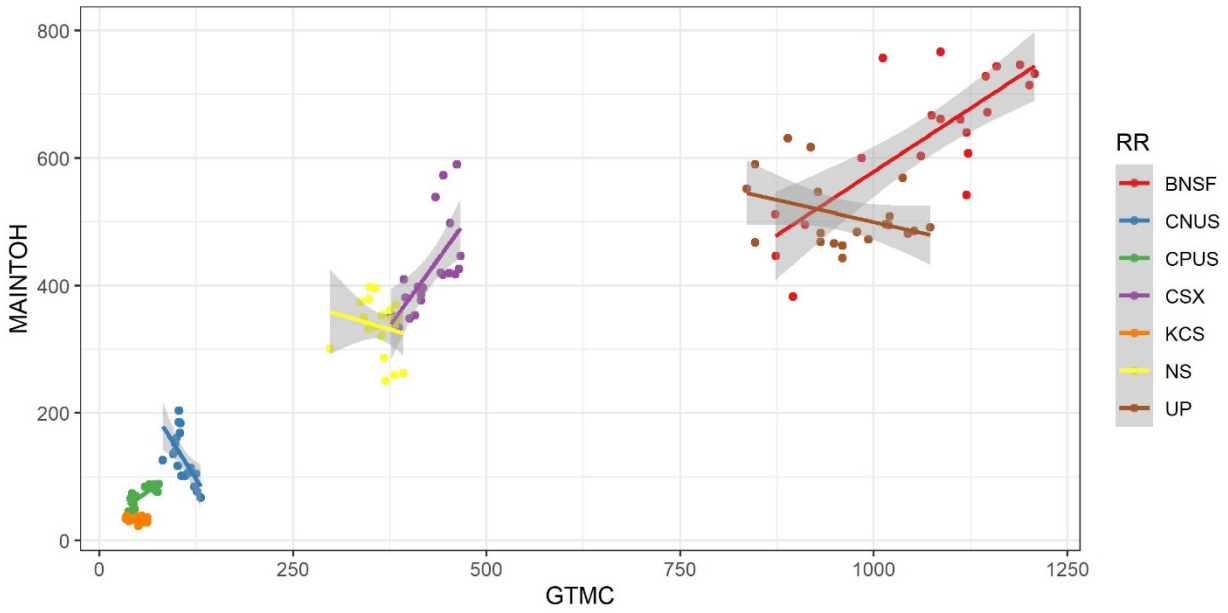


Figure B-7. RUNWAGE versus TMI

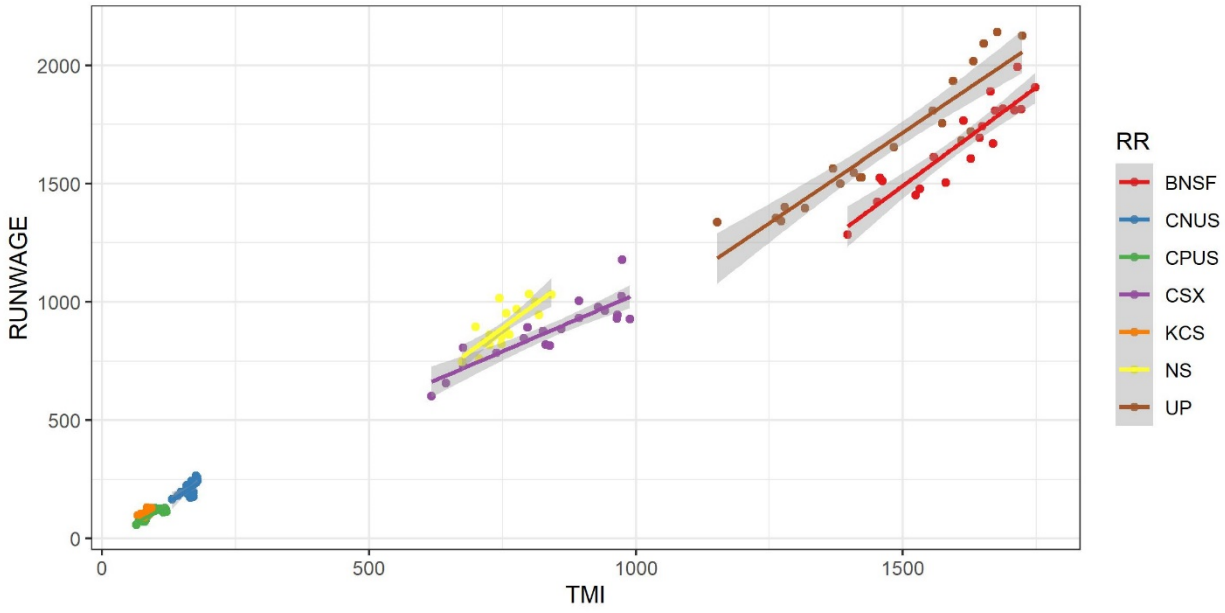


Figure B-8. TRANSOH versus TMI

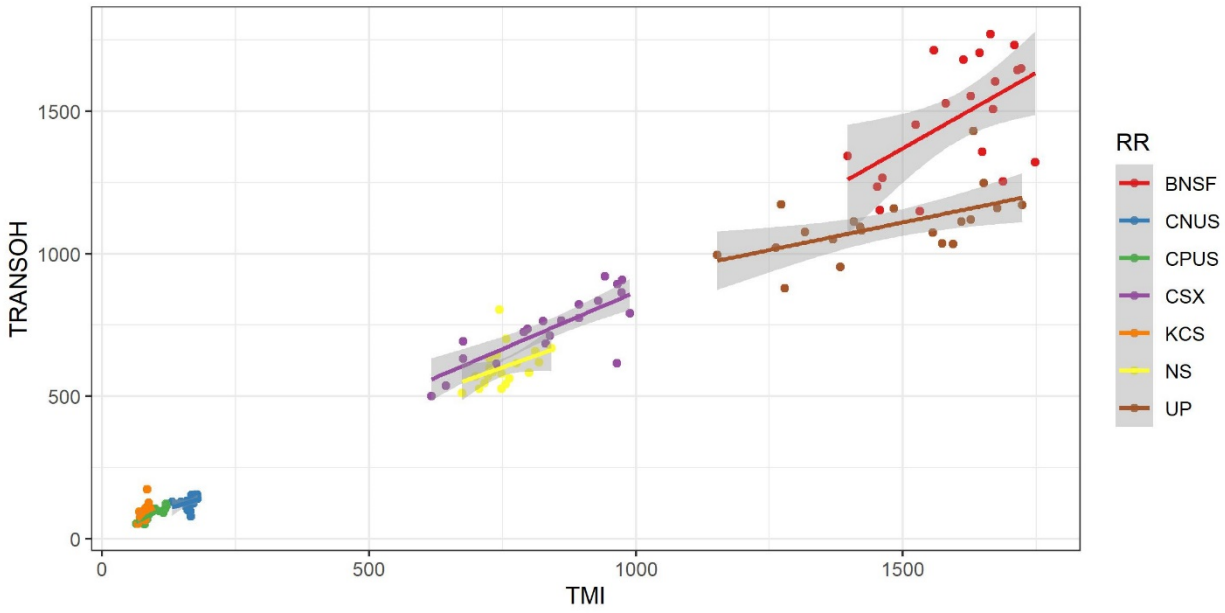


Figure B-9. RUNFUEL versus LRM

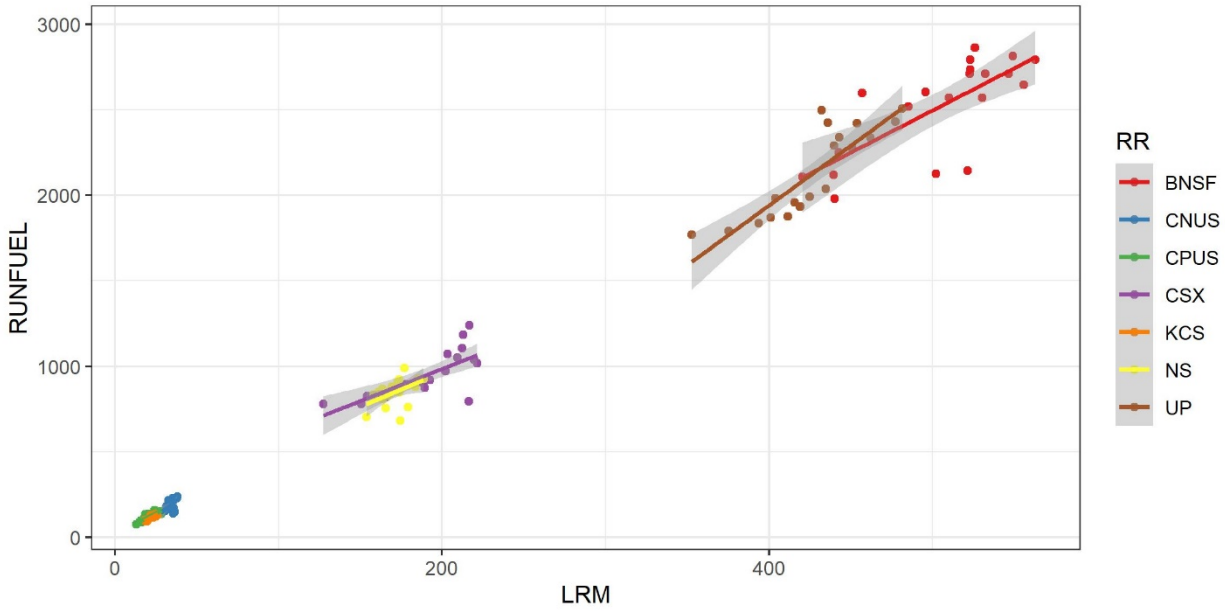


Figure B-10. RLOCREP versus LRM

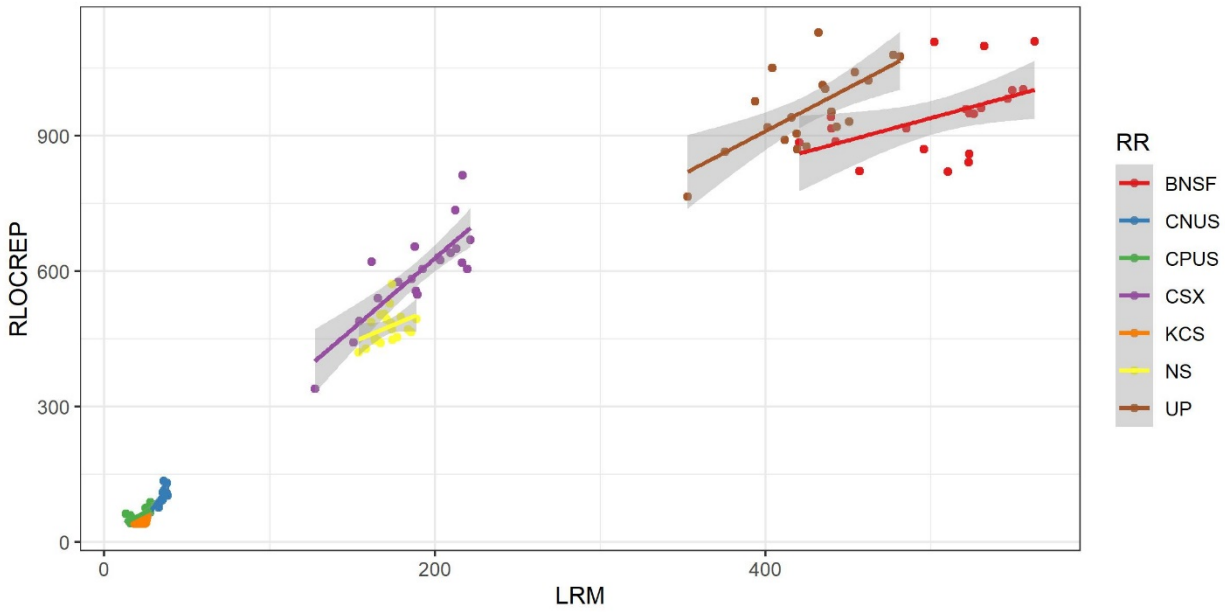


Figure B-11. TRNINSP versus TMI

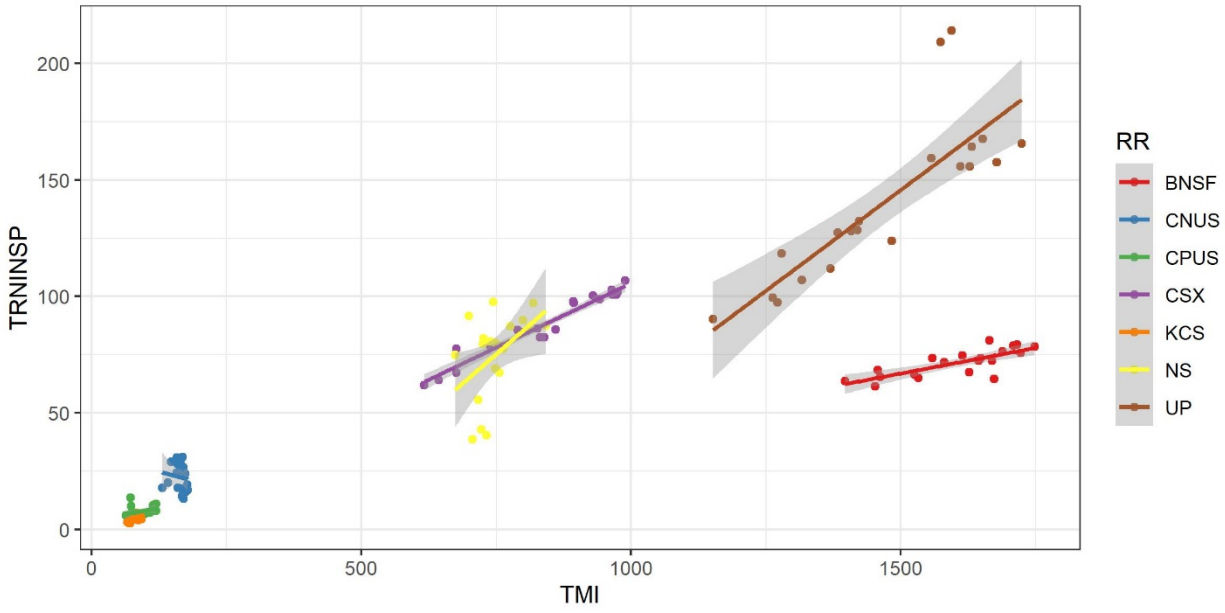


Figure B-12. CLWRCK versus TMI

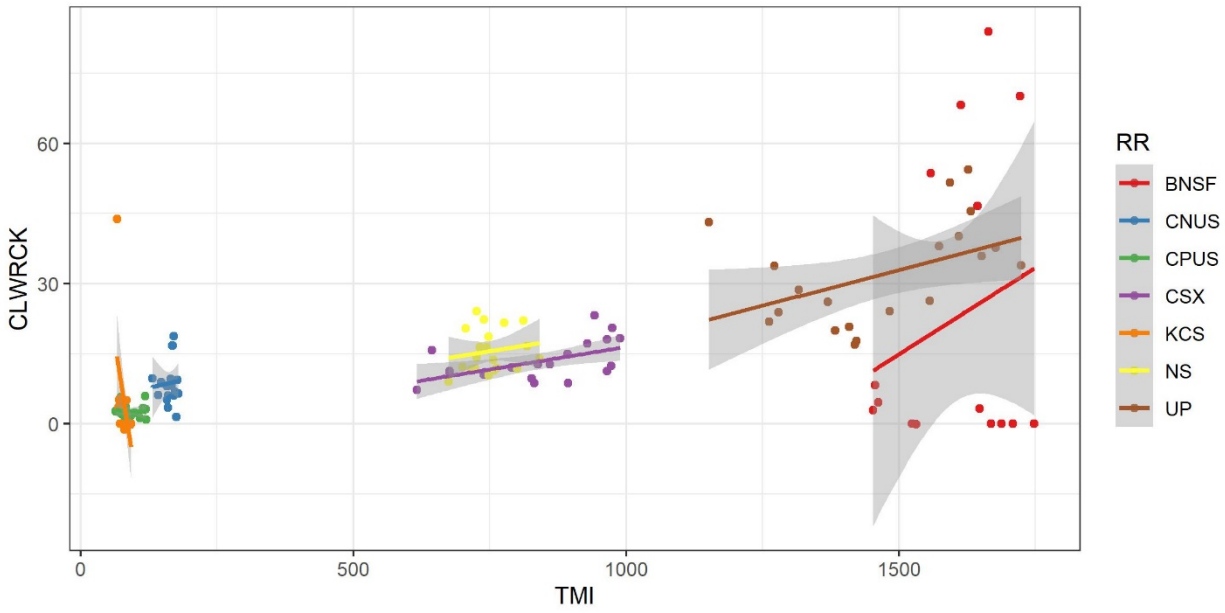


Figure B-13. SWMAINT versus THS

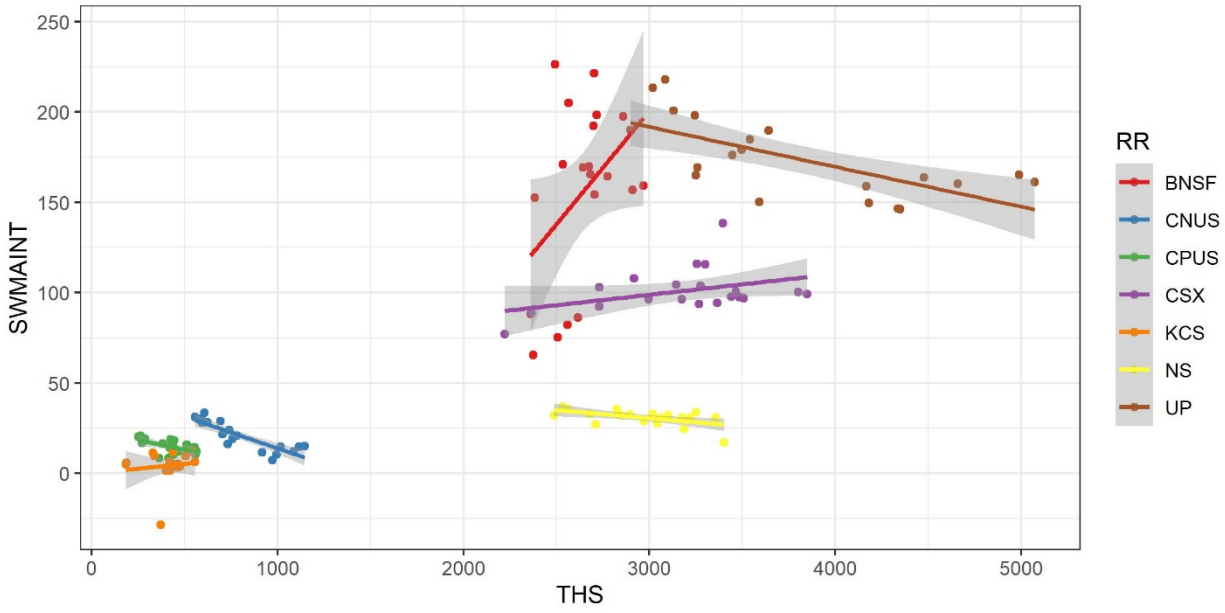


Figure B-14. YARDOPS versus THY

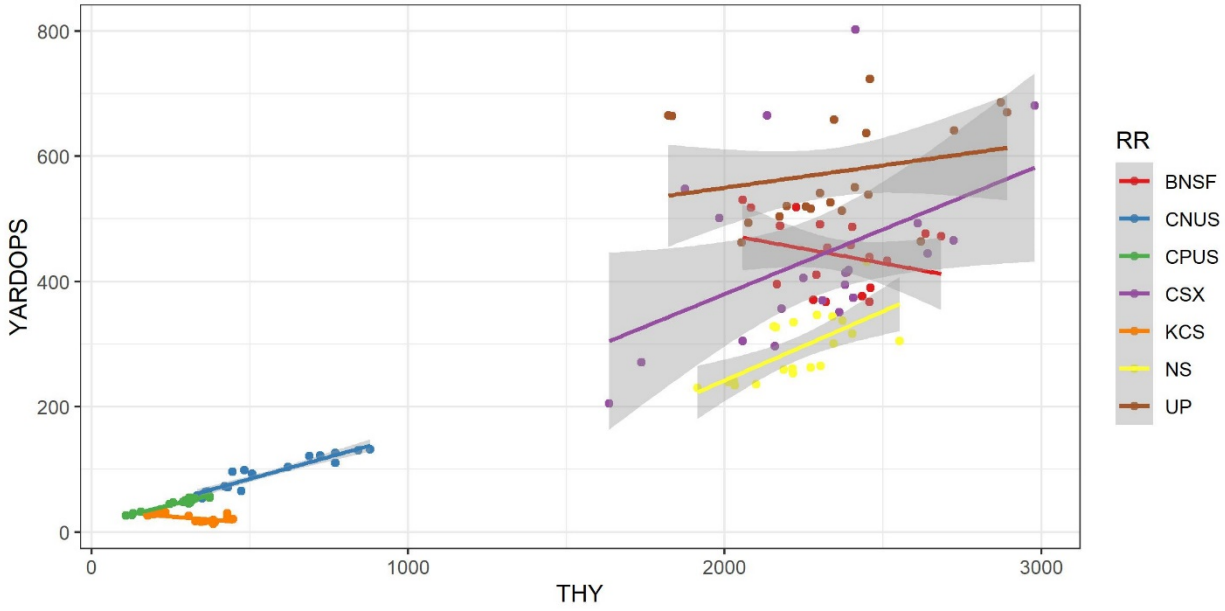


Figure B-15. SWWAGE versus THY

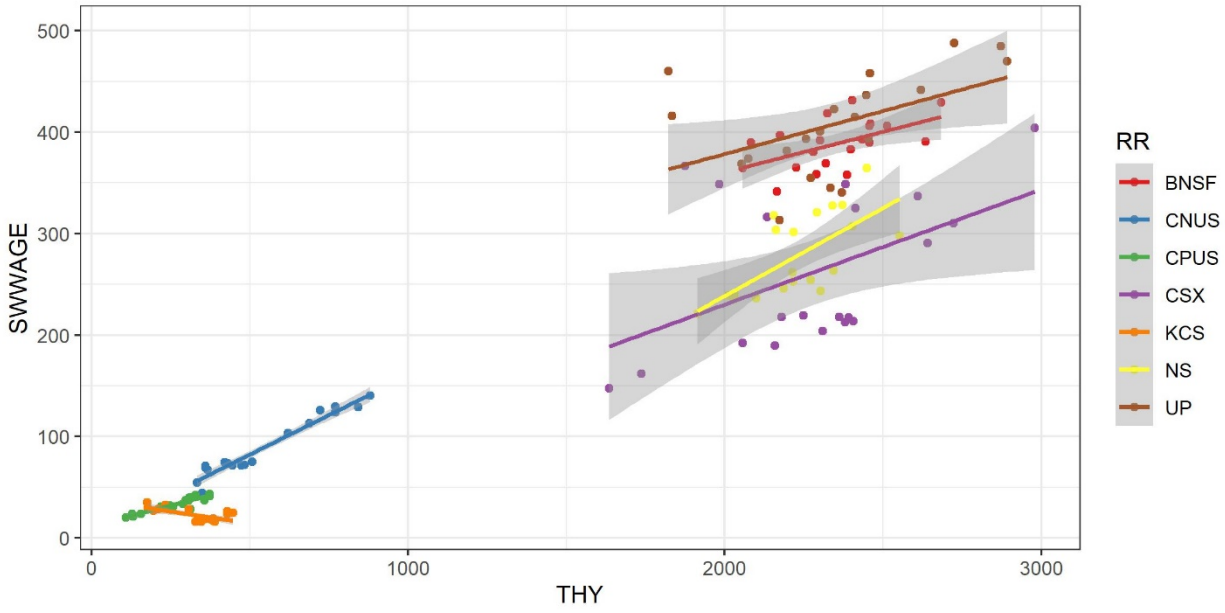


Figure B-16. YLOCREP versus THY

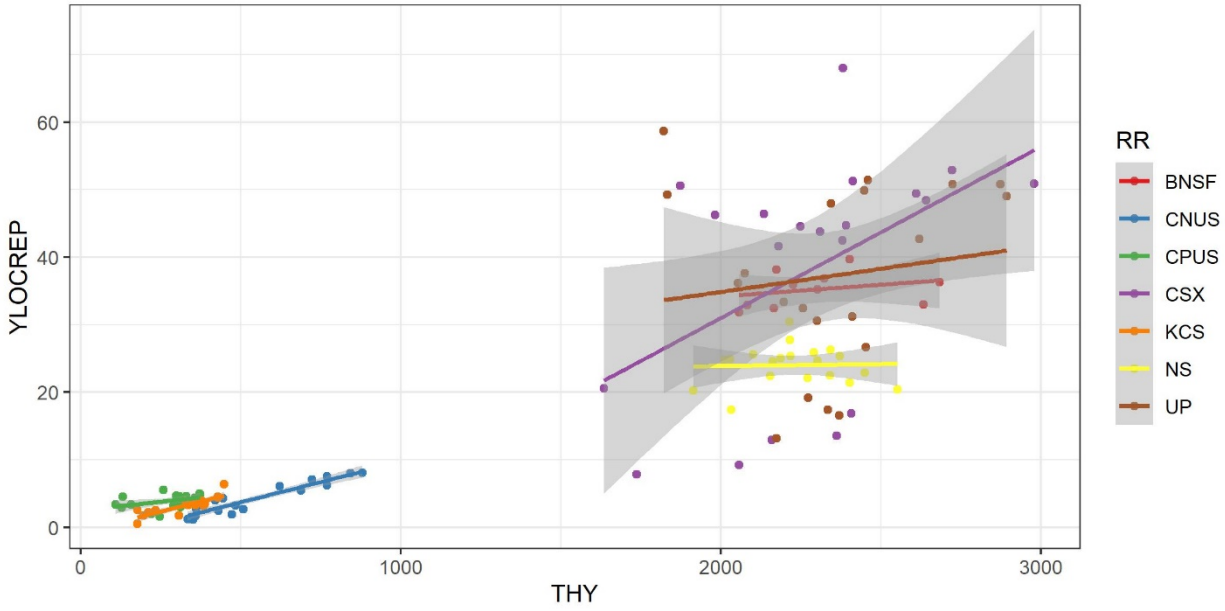


Figure B-17. CAREXP versus COR

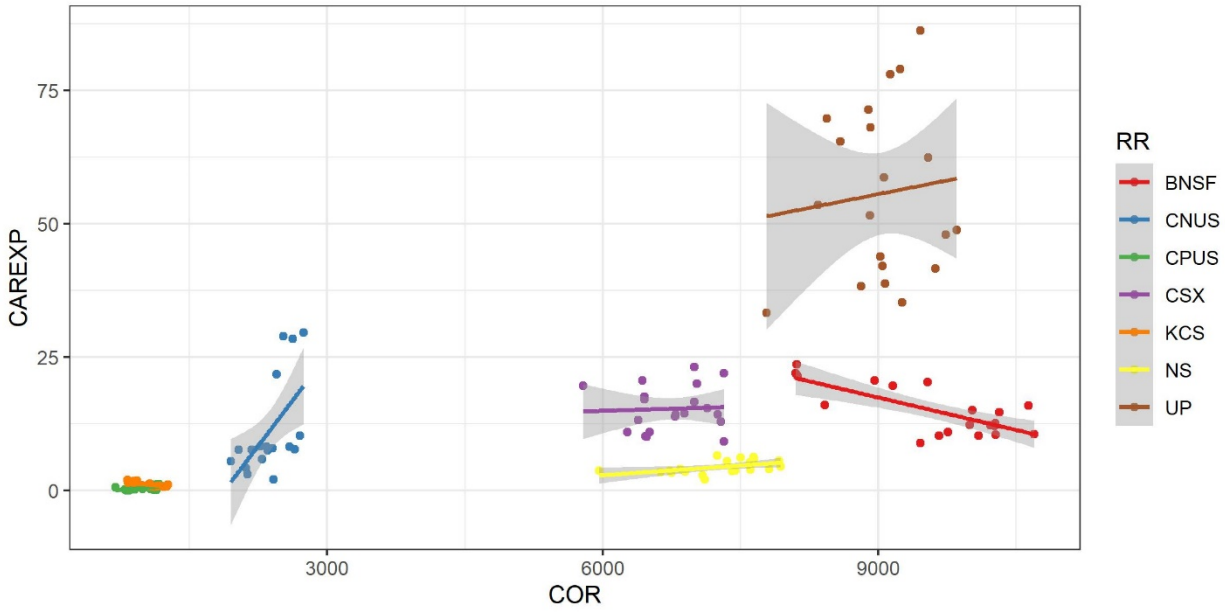


Figure B-18. GENADMN versus GTMC

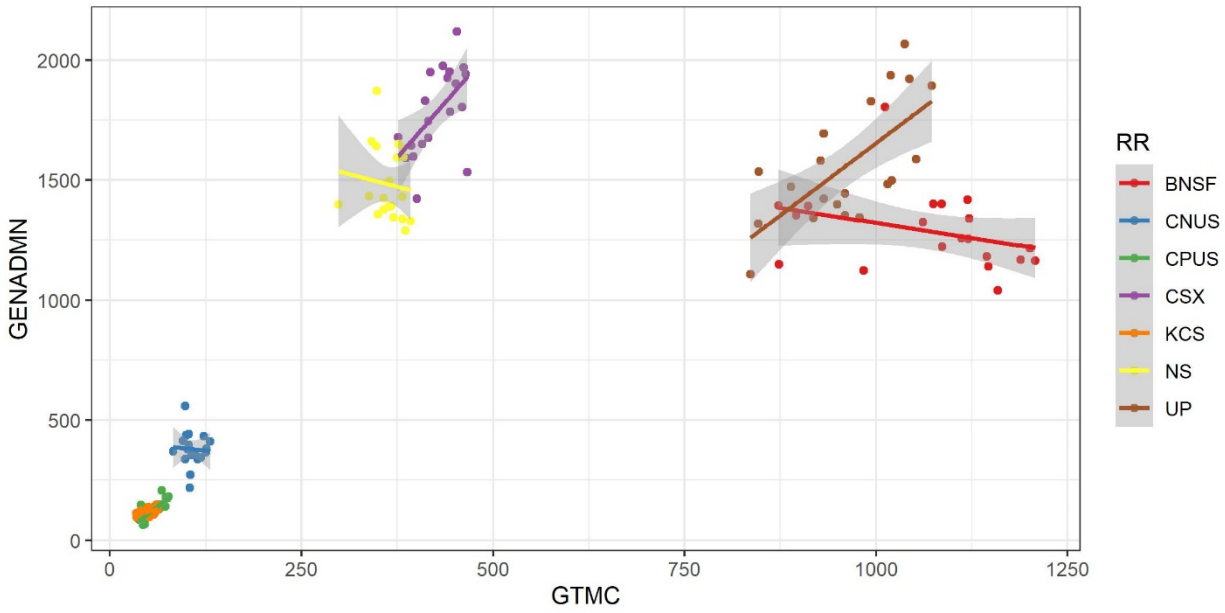


Figure B-19. CAREP versus CLOR

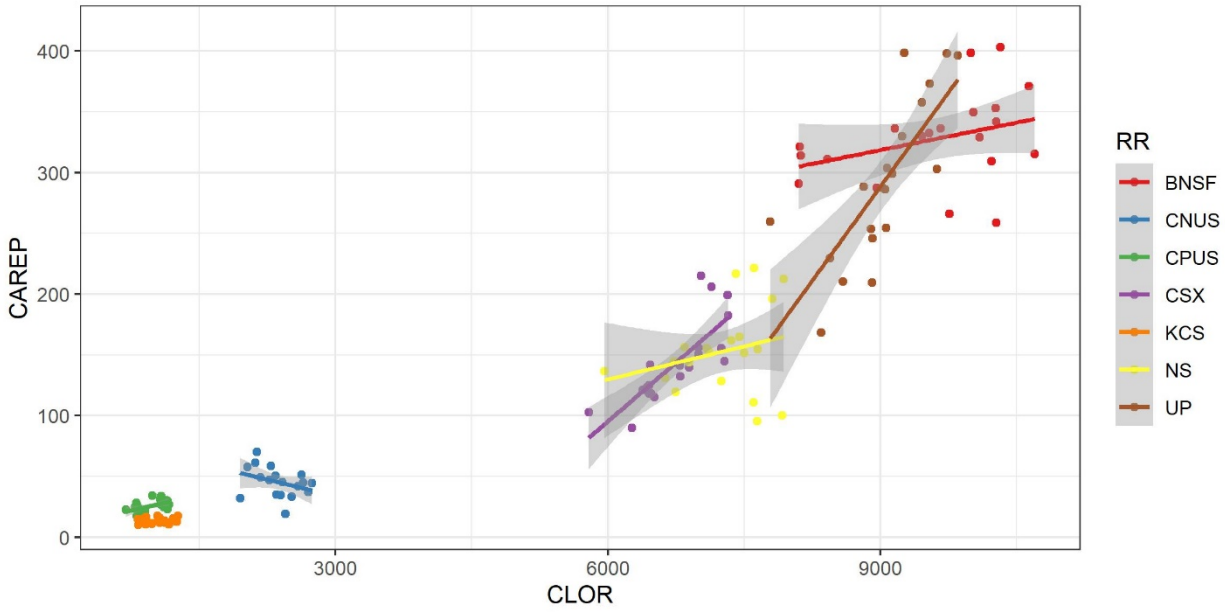


Figure B-20. CAROH versus CMP

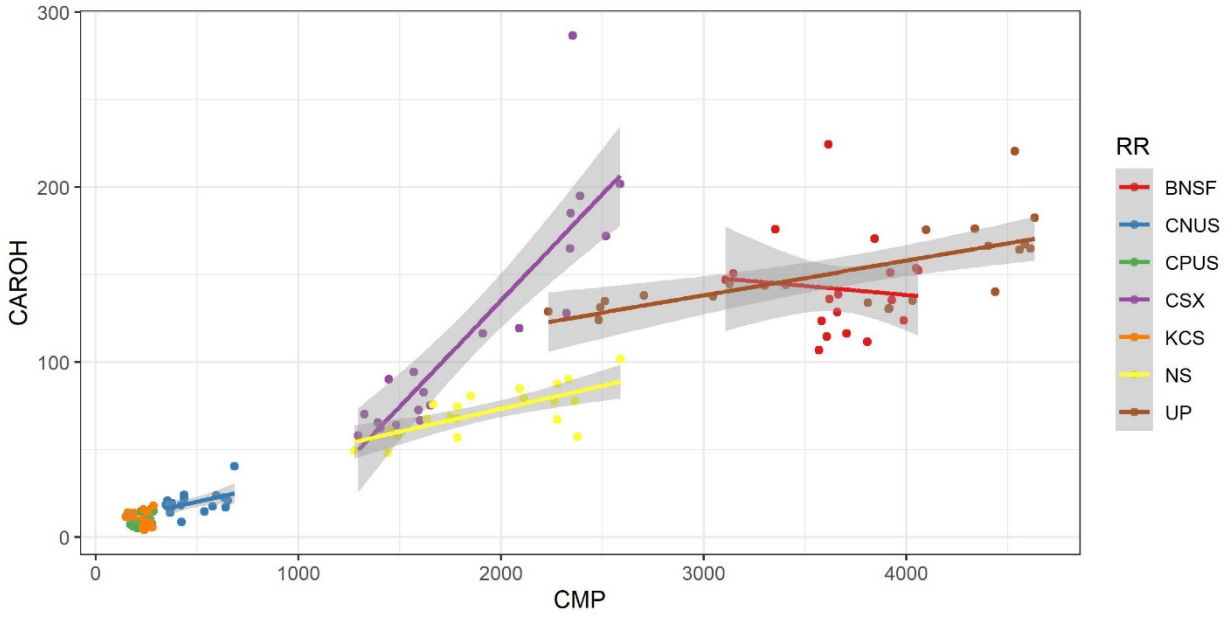


Figure B-21. RMAINT+MAINTOH versus GTMC

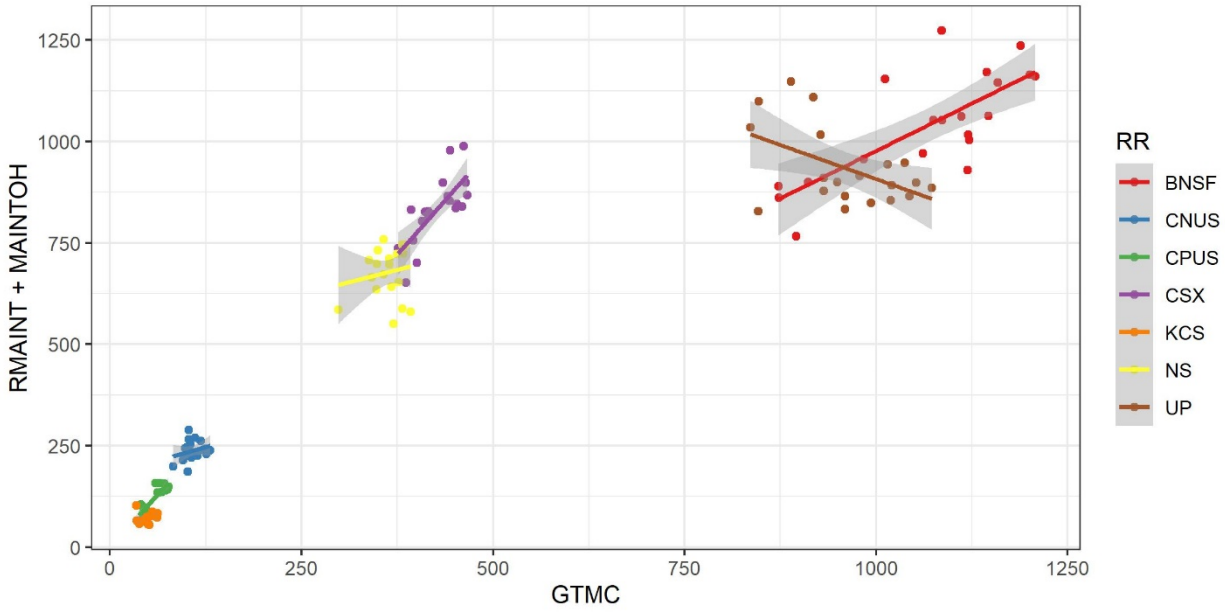


Figure B-22. RUNWAGE2 versus TMI

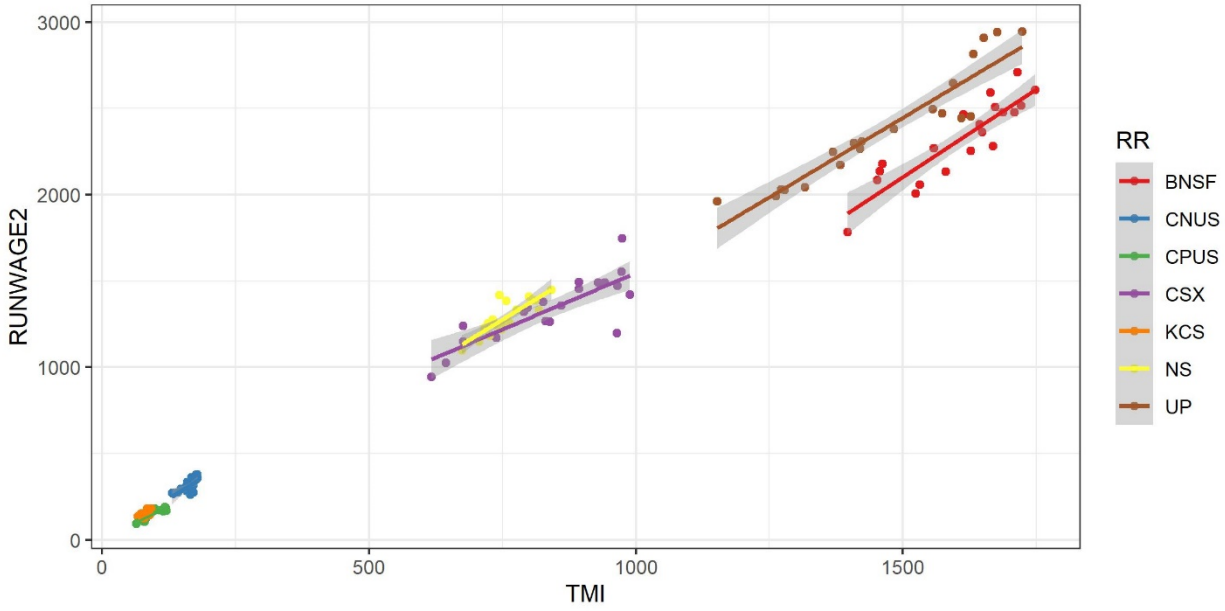


Figure B-23. TRANSOH2 versus TMI

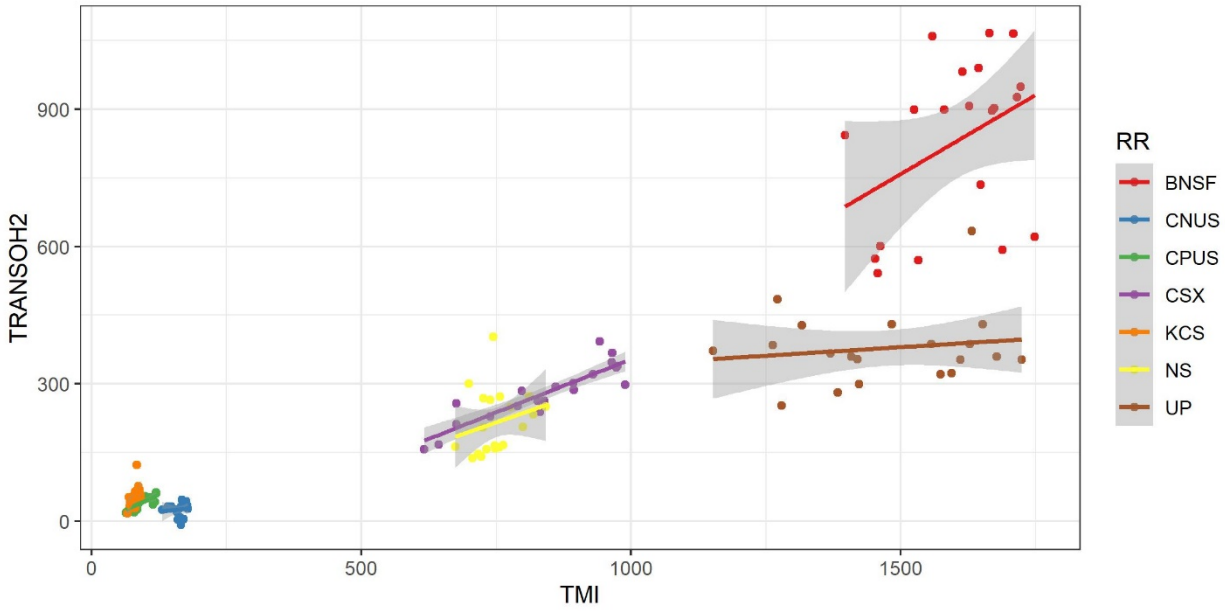


Figure B-24. CLWRCKS2 versus TMI

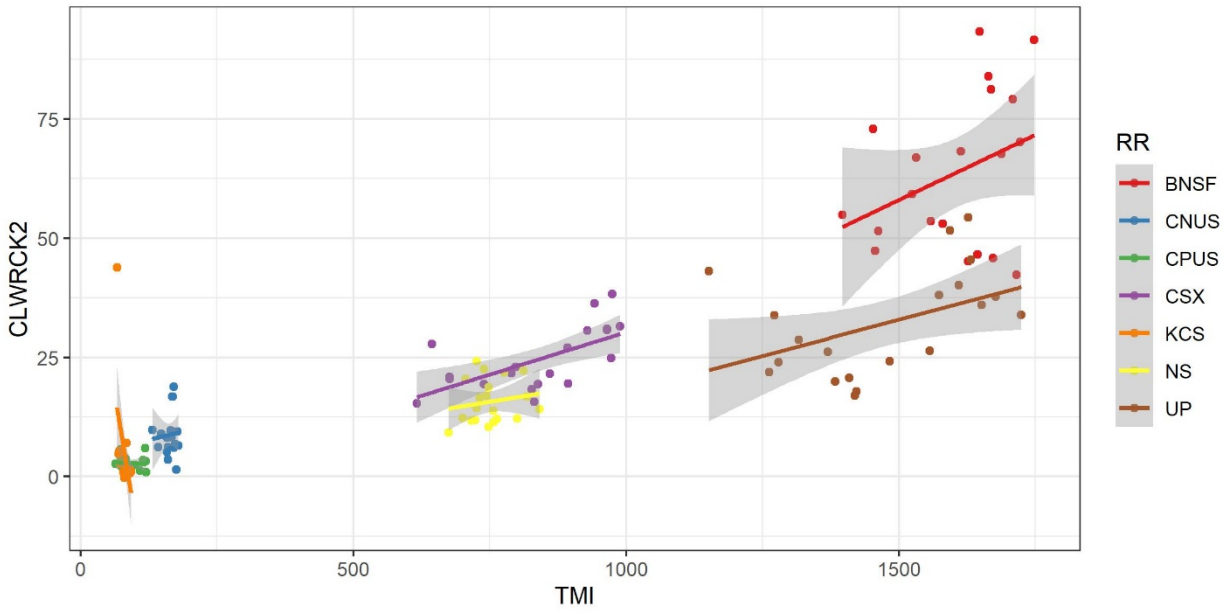


Figure B-25. YARDOPS3 versus THY

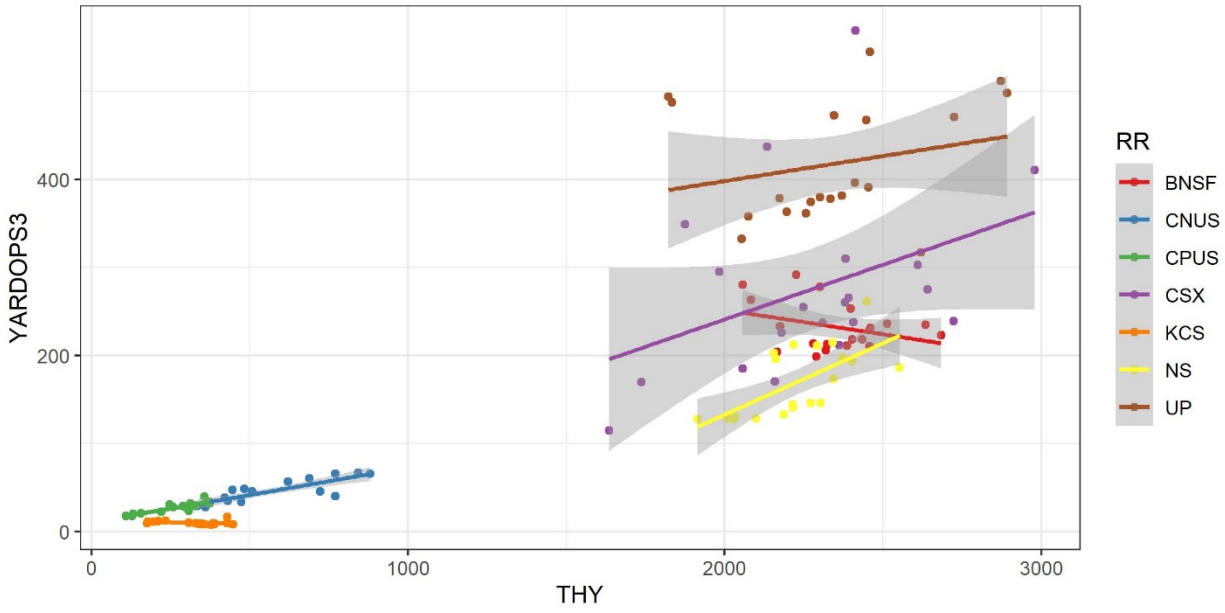


Figure B-26. SWWAGE2 versus THY

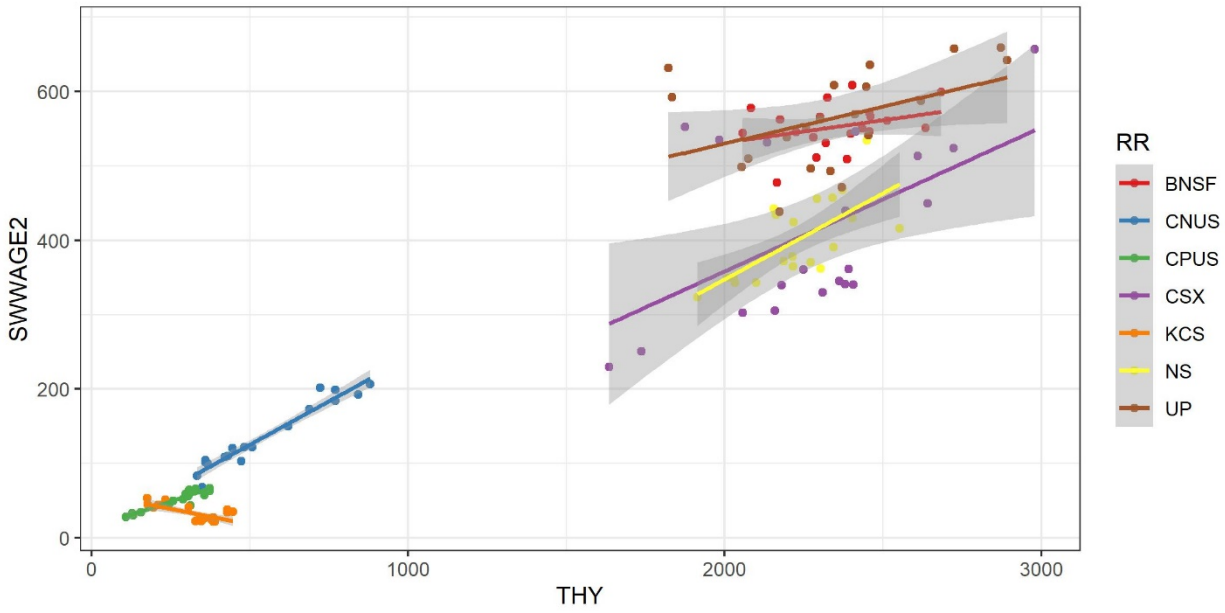
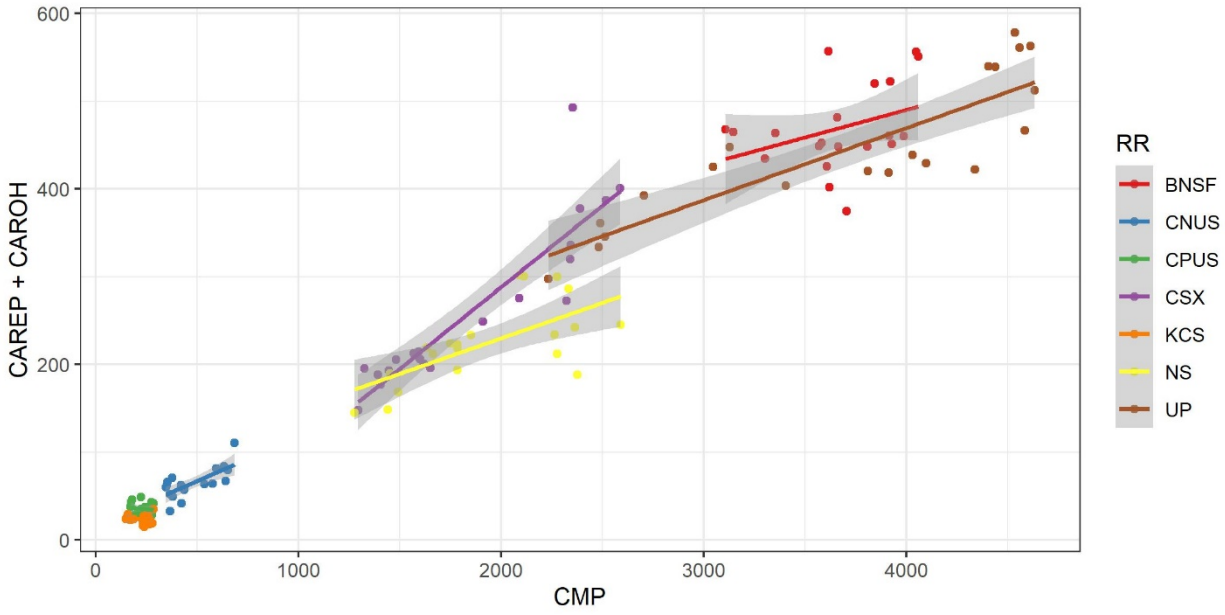


Figure B-27. CAREP+CAROH versus CMP



APPENDIX C. ADDITIONAL ECONOMETRIC RESULTS FOR THE PHASE I VARIABILITY MODELS

Table C-1: Output Elasticity Estimates by Railroad – Levels

Expense Category	CNUS	NS	CSX	BNSF	KCS	CPUS	UP
Running Track Maintenance and Overhead	0.19	0.17	0.17	0.28	0.19	0.16	0.22
	(0.08)	(0.07)	(0.07)	(0.10)	(0.08)	(0.06)	(0.08)
Running Crew Wages	0.75	0.77	0.75	0.83	0.75	0.68	0.78
	(0.06)	(0.05)	(0.06)	(0.04)	(0.06)	(0.07)	(0.05)
Transportation Overhead	0.76	0.78	0.76	0.84	0.76	0.69	0.79
	(0.19)	(0.18)	(0.20)	(0.15)	(0.20)	(0.23)	(0.18)
Transportation Fuel Expenses	0.88	0.90	0.88	0.95	0.90	0.85	0.92
	(0.04)	(0.03)	(0.04)	(0.02)	(0.03)	(0.04)	(0.02)
Road Locomotive Service and Repair	0.53	0.57	0.52	0.74	0.57	0.46	0.65
	(0.06)	(0.05)	(0.06)	(0.04)	(0.05)	(0.06)	(0.05)
Road Train Inspection	0.47	0.51	0.47	0.59	0.47	0.39	0.51
	(0.11)	(0.11)	(0.11)	(0.10)	(0.11)	(0.10)	(0.11)
Wreck Clearing	0.62	0.64	0.61	0.72	0.61	0.53	0.65
	(0.20)	(0.20)	(0.20)	(0.17)	(0.21)	(0.21)	(0.20)
Switching Maintenance and Overhead	0.39	0.43	0.37	0.42	0.53	0.43	0.46
	(0.15)	(0.15)	(0.14)	(0.15)	(0.15)	(0.15)	(0.15)
Yard Operations	0.22	0.32	0.23	0.39	0.42	0.20	0.32
	(0.06)	(0.08)	(0.06)	(0.09)	(0.09)	(0.06)	(0.08)
Switching Crew Wages	0.33	0.44	0.33	0.52	0.55	0.30	0.45
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Yard Locomotive Repairs	0.52	0.64	0.53	0.71	0.74	0.50	0.65
	(0.09)	(0.08)	(0.09)	(0.08)	(0.07)	(0.09)	(0.08)
Carload Related Expenses	-1.21	-0.83	-0.58	-0.60	-1.10	-0.46	-0.44
	(1.30)	(0.74)	(0.45)	(0.47)	(1.12)	(0.32)	(0.31)
General and Administrative	0.23	0.20	0.20	0.33	0.22	0.18	0.26
	(0.14)	(0.13)	(0.13)	(0.17)	(0.14)	(0.12)	(0.15)
Freight Car Repair Expenses and Overhead	0.59	0.60	0.60	0.73	0.68	0.49	0.62
	(0.11)	(0.10)	(0.10)	(0.09)	(0.09)	(0.11)	(0.10)

Table C-2: Output Elasticity Estimates by Railroad – Translog

Expense Category	CNUS	NS	CSX	BNSF	KCS	CPUS	UP
Running Track Maintenance and Overhead	0.27	0.45	0.43	0.04	0.24	0.43	0.26
	(0.11)	(0.08)	(0.09)	(0.18)	(0.14)	(0.10)	(0.13)
Running Crew Wages	0.77	0.85	0.85	0.88	0.72	0.75	0.89
	(0.05)	(0.06)	(0.05)	(0.10)	(0.07)	(0.06)	(0.07)
Transportation Overhead	0.45	0.97	1.02	1.07	0.15	0.43	1.18
	(0.14)	(0.19)	(0.19)	(0.30)	(0.19)	(0.19)	(0.24)
Transportation Fuel Expenses	0.85	1.03	1.11	0.87	0.67	0.90	1.01
	(0.03)	(0.03)	(0.05)	(0.06)	(0.05)	(0.04)	(0.05)
Road Locomotive Service and Repair	0.63	0.67	0.72	0.56	0.57	0.67	0.64
	(0.07)	(0.06)	(0.06)	(0.13)	(0.11)	(0.09)	(0.09)
Road Train Inspection	0.47	0.67	0.74	0.59	0.34	0.58	0.76
	(0.13)	(0.10)	(0.08)	(0.16)	(0.20)	(0.13)	(0.12)
Wreck Clearing	0.45	0.74	0.71	0.90	0.29	0.32	0.84
	(0.21)	(0.22)	(0.19)	(0.38)	(0.31)	(0.25)	(0.27)
Switching Maintenance and Overhead	0.66	0.45	0.59	0.47	0.40	0.67	0.37
	(0.19)	(0.14)	(0.20)	(0.15)	(0.29)	(0.28)	(0.14)
Yard Operations	0.12	0.39	0.21	0.51	0.45	0.01	0.40
	(0.16)	(0.10)	(0.16)	(0.11)	(0.13)	(0.21)	(0.10)
Switching Crew Wages	0.65	0.56	0.68	0.49	0.41	0.65	0.56
	(0.08)	(0.06)	(0.10)	(0.07)	(0.09)	(0.10)	(0.06)
Yard Locomotive Repairs	0.53	0.59	0.35	0.74	1.08	0.63	0.59
	(0.23)	(0.10)	(0.23)	(0.21)	(0.33)	(0.35)	(0.12)
Carload Related Expenses	-0.25	-0.54	-0.23	-0.48	0.14	0.74	-0.16
	(0.49)	(0.43)	(0.29)	(0.38)	(0.48)	(0.34)	(0.31)
General and Administrative	0.22	0.23	0.19	-0.61	0.35	0.57	-0.23
	(0.18)	(0.17)	(0.18)	(0.36)	(0.20)	(0.14)	(0.26)
Freight Car Repair Expenses and Overhead	0.73	0.76	0.76	0.62	0.60	0.83	0.76
	(0.13)	(0.13)	(0.13)	(0.14)	(0.14)	(0.23)	(0.14)

Table C-3: Regressions by Cost Pool – Specification 1 (Levels), No Railroad Fixed Effects

Cost Pool	Output	Capacity	N
Running Track Maintenance and Overhead	0.325	0.022	254
	(0.131)	(0.002)	
Running Crew Wages	1.334	0.010	254
	(0.088)	(0.003)	
Transportation Overhead	0.261	0.002	253
	(0.053)	(0.002)	
Transportation Fuel Expenses	4.558	0.003	254
	(0.12)	(0.001)	
Road Locomotive Service and Repair	1.620	0.007	254
	(0.133)	(0.001)	
Road Train Inspection	0.037	0.001	254
	(0.008)	(0)	
Wreck Clearing	0.020	0.000	224
	(0.006)	(0)	
Switching Maintenance and Overhead	0.009	0.002	232
	(0.003)	(0.001)	
Yard Operations	0.032	0.020	254
	(0.007)	(0.004)	
Switching Crew Wages	0.113	0.042	254
	(0.01)	(0.005)	
Yard Locomotive Repairs	0.010	0.002	232
	(0.001)	(0)	
Carload Related Expenses	0.000	0.000	218
	(0)	(0)	
General and Administrative	0.523	0.029	254
	(0.321)	(0.006)	
Freight Car Repair Expenses and Overhead	0.106	0.003	254
	(0.013)	(0.001)	

Table C-4: Regressions by Cost Pool – Specification 2 (Logs), No Railroad Fixed Effects

Cost Pool	Output	Capacity	N
Running Track Maintenance and Overhead	0.550	0.426	254
	(0.066)	(0.074)	
Running Crew Wages	0.822	0.203	254
	(0.038)	(0.046)	
Transportation Overhead	0.646	0.269	253
	(0.135)	(0.171)	
Transportation Fuel Expenses	0.870	0.130	254
	(0.026)	(0.033)	
Road Locomotive Service and Repair	0.625	0.474	254
	(0.047)	(0.06)	
Road Train Inspection	0.696	0.353	254
	(0.07)	(0.089)	
Wreck Clearing	0.526	0.469	224
	(0.138)	(0.175)	
Switching Maintenance and Overhead	0.379	0.538	232
	(0.12)	(0.145)	
Yard Operations	0.365	0.571	254
	(0.068)	(0.095)	
Switching Crew Wages	0.521	0.489	254
	(0.043)	(0.055)	
Yard Locomotive Repairs	0.628	0.497	232
	(0.065)	(0.097)	
Carload Related Expenses	0.076	0.654	218
	(0.222)	(0.227)	
General and Administrative	0.565	0.382	254
	(0.125)	(0.133)	
Freight Car Repair Expenses and Overhead	0.687	0.304	254
	(0.08)	(0.093)	

Table C-5: Regressions by Cost Pool – Specification 3 (Translog), No Railroad Fixed Effects

Cost Pool	Output	Capacity	Output^2	Capacity^2	Output*Capacity	N
Running Track Maintenance and Overhead	-2.961	3.373	-0.332	-0.346	0.720	254
	(1.216)	(1.273)	(0.097)	(0.122)	(0.222)	
Running Crew Wages	0.136	0.540	-0.004	-0.039	0.075	254
	(0.677)	(0.691)	(0.062)	(0.074)	(0.136)	
Transportation Overhead	-4.702	5.125	-0.160	-0.491	0.762	253
	(2.51)	(3.014)	(0.232)	(0.309)	(0.526)	
Transportation Fuel Expenses	-2.670	4.673	-0.173	-0.365	0.535	254
	(0.722)	(0.984)	(0.044)	(0.077)	(0.114)	
Road Locomotive Service and Repair	-0.848	2.714	-0.093	-0.175	0.242	254
	(1.089)	(1.322)	(0.069)	(0.105)	(0.168)	
Road Train Inspection	-3.284	4.277	-0.252	-0.421	0.713	254
	(1.779)	(2.03)	(0.121)	(0.194)	(0.313)	
Wreck Clearing	-0.779	3.210	0.091	-0.159	0.031	224
	(2.821)	(3.177)	(0.253)	(0.317)	(0.559)	
Switching Maintenance and Overhead	0.193	-0.127	-0.315	-0.182	0.536	232
	(1.396)	(1.884)	(0.208)	(0.248)	(0.429)	
Yard Operations	0.401	1.302	0.207	0.107	-0.359	254
	(0.565)	(0.969)	(0.121)	(0.136)	(0.239)	
Switching Crew Wages	0.066	0.740	-0.117	-0.126	0.259	254
	(0.388)	(0.609)	(0.067)	(0.088)	(0.144)	
Yard Locomotive Repairs	2.285	-4.178	0.220	0.532	-0.572	232
	(1.186)	(1.663)	(0.245)	(0.273)	(0.501)	
Carload Related Expenses	2.265	4.150	-0.764	-0.652	1.065	218
	(2.139)	(1.916)	(0.468)	(0.399)	(0.863)	
General and Administrative	-3.105	2.569	-0.573	-0.370	0.992	254
	(2.046)	(2.127)	(0.195)	(0.218)	(0.414)	
Freight Car Repair Expenses and Overhead	-0.397	0.419	-0.136	-0.112	0.304	254
	(1.172)	(1.19)	(0.145)	(0.165)	(0.309)	

Table C-6: Regressions by Cost Pool – Specification 1, with Railroad Fixed Effects

Cost Pool	Output	Capacity	N
Running Track Maintenance and Overhead	0.330	0.023	254
	(0.154)	(0.005)	
Running Crew Wages	1.379	0.012	254
	(0.106)	(0.006)	
Transportation Overhead	0.255	0.010	253
	(0.071)	(0.004)	
Transportation Fuel Expenses	4.160	0.004	254
	(0.28)	(0.003)	
Road Locomotive Service and Repair	1.657	0.005	254
	(0.201)	(0.002)	
Road Train Inspection	0.044	0.001	254
	(0.008)	(0)	
Wreck Clearing	0.034	0.000	224
	(0.006)	(0)	
Switching Maintenance and Overhead	0.007	0.000	232
	(0.003)	(0.001)	
Yard Operations	0.029	0.014	254
	(0.008)	(0.006)	
Switching Crew Wages	0.091	0.017	254
	(0.01)	(0.009)	
Yard Locomotive Repairs	0.009	0.002	232
	(0.001)	(0.001)	
Carload Related Expenses	0.000	0.000	218
	(0)	(0)	
General and Administrative	0.381	0.013	254
	(0.355)	(0.007)	
Freight Car Repair Expenses and Overhead	0.094	0.000	254
	(0.014)	(0.002)	

Table C-7: Regressions by Cost Pool – Specification 2, with Railroad Fixed Effects

Cost Pool	Output	Capacity	N
Running Track Maintenance and Overhead	0.603	0.503	254
	(0.077)	(0.202)	
Running Crew Wages	0.876	0.453	254
	(0.042)	(0.107)	
Transportation Overhead	0.810	1.101	253
	(0.181)	(0.419)	
Transportation Fuel Expenses	0.821	0.226	254
	(0.054)	(0.078)	
Road Locomotive Service and Repair	0.750	0.308	254
	(0.05)	(0.14)	
Road Train Inspection	0.752	0.181	254
	(0.067)	(0.221)	
Wreck Clearing	0.675	0.641	224
	(0.134)	(0.579)	
Switching Maintenance and Overhead	0.231	0.062	232
	(0.114)	(0.221)	
Yard Operations	0.260	0.015	254
	(0.065)	(0.166)	
Switching Crew Wages	0.454	0.251	254
	(0.045)	(0.144)	
Yard Locomotive Repairs	0.604	0.455	232
	(0.073)	(0.253)	
Carload Related Expenses	0.054	0.868	218
	(0.22)	(0.31)	
General and Administrative	0.738	0.111	254
	(0.132)	(0.143)	
Freight Car Repair Expenses and Overhead	0.638	-0.067	254
	(0.094)	(0.237)	

Table C-8: Regressions by Cost Pool – Specification 3, with Railroad Fixed Effects

Cost Pool	Output	Capacity	Output^2	Capacity^2	Output*Capacity	N
Running Track Maintenance and Overhead	-4.200	1.457	-0.349	-0.260	0.871	254
	(1.349)	(1.94)	(0.098)	(0.148)	(0.234)	
Running Crew Wages	0.222	0.869	0.094	-0.004	-0.042	254
	(0.804)	(1.175)	(0.065)	(0.097)	(0.152)	
Transportation Overhead	-1.225	8.211	0.101	-0.426	0.100	253
	(3.407)	(5.158)	(0.287)	(0.446)	(0.678)	
Transportation Fuel Expenses	-3.457	6.036	-0.232	-0.471	0.667	254
	(0.984)	(1.558)	(0.063)	(0.117)	(0.153)	
Road Locomotive Service and Repair	0.570	4.809	0.044	-0.261	-0.022	254
	(1.374)	(1.998)	(0.081)	(0.147)	(0.206)	
Road Train Inspection	-5.629	8.662	-0.352	-0.773	1.073	254
	(2.053)	(2.961)	(0.126)	(0.248)	(0.347)	
Wreck Clearing	1.574	3.232	0.348	0.011	-0.498	224
	(4.309)	(4.982)	(0.27)	(0.325)	(0.717)	
Switching Maintenance and Overhead	-0.345	1.109	-0.196	-0.217	0.381	232
	(1.352)	(2.044)	(0.205)	(0.246)	(0.415)	
Yard Operations	0.266	0.736	0.149	0.068	-0.257	254
	(0.566)	(1.482)	(0.102)	(0.139)	(0.207)	
Switching Crew Wages	0.351	0.872	-0.106	-0.123	0.193	254
	(0.405)	(1.07)	(0.071)	(0.097)	(0.153)	
Yard Locomotive Repairs	3.479	-1.524	0.121	0.356	-0.553	232
	(1.32)	(2.906)	(0.247)	(0.298)	(0.515)	
Carload Related Expenses	-0.043	5.570	-0.736	-0.810	1.244	218
	(2.195)	(3.934)	(0.531)	(0.483)	(0.986)	
General and Administrative	-1.169	1.421	-0.230	-0.186	0.448	254
	(1.739)	(2.412)	(0.154)	(0.201)	(0.342)	
Freight Car Repair Expenses and Overhead	-1.405	1.174	-0.229	-0.255	0.538	254
	(1.366)	(2.296)	(0.159)	(0.202)	(0.346)	

APPENDIX D. HYBRID MODEL COSTS AND R/VC RATIOS BY COMMODITY

Table D-1. 2019 Variable Cost Per Ton-Mile (2019 Cents) by Commodity Groups, URCS and Hybrid Model Scenarios

Commodity	STCC (2-digit)	URCS	Hybrid-URCS	Hybrid-CA1	Hybrid-CA2	Hybrid-CA3
Corn	01	1.90	1.98	1.86	1.37	1.48
Other Farm Products	01	2.63	2.31	2.16	1.60	1.75
Soybeans	01	1.74	1.91	1.78	1.33	1.41
Wheat	01	2.11	2.24	2.10	1.56	1.67
Metallic Ores	10	2.71	4.14	3.96	2.81	3.41
Coal	11	1.42	1.70	1.59	1.18	1.27
Petroleum, Natural Gas, and Gasoline	13	1.99	1.94	1.84	1.36	1.53
Nonmetallic Minerals	14	2.17	2.63	2.49	1.83	2.00
Food Products	20	2.68	2.53	2.39	1.76	1.96
Lumber or Wood Products	24	3.17	2.96	2.82	2.03	2.37
Chemicals	28	2.49	2.62	2.50	1.82	2.09
Petroleum or Coal Products	29	3.07	3.26	3.10	2.26	2.49
Clay, Concrete, Glass, or Stone Products	32	2.87	3.34	3.16	2.33	2.48
Primary Metal Products	33	3.56	3.31	3.15	2.31	2.51
Transportation Equipment	37	9.31	8.74	8.31	6.08	6.95
Other	Various	3.96	3.43	3.24	2.38	2.63

Table D-2. Percent Change in Variable Cost Per Ton-Mile (2019 Cents), Hybrid Scenarios Compared to URCS, by Commodity Groups

Commodity	STCC (2-digit)	Hybrid-URCS	Hybrid-CA1	Hybrid-CA2	Hybrid-CA3
Corn	01	4%	-2%	-28%	-22%
Other Farm Products	01	-12%	-18%	-39%	-34%
Soybeans	01	10%	3%	-24%	-19%
Wheat	01	6%	-1%	-26%	-21%
Metallic Ores	10	53%	46%	4%	26%
Coal	11	20%	12%	-17%	-10%
Petroleum, Natural Gas, and Gasoline	13	-2%	-7%	-32%	-23%
Nonmetallic Minerals	14	21%	15%	-16%	-8%
Food Products	20	-6%	-11%	-34%	-27%
Lumber or Wood Products	24	-7%	-11%	-36%	-25%
Chemicals	28	5%	1%	-27%	-16%
Petroleum or Coal Products	29	6%	1%	-26%	-19%
Clay, Concrete, Glass, or Stone Products	32	16%	10%	-19%	-13%
Primary Metal Products	33	-7%	-11%	-35%	-29%
Transportation Equipment	37	-6%	-11%	-35%	-25%
Other	Various	-13%	-18%	-40%	-34%

Table D-3. 2019 Revenue/Variable Cost Ratio by Commodity Groups, URCS and Hybrid Model Scenarios

Commodity	STCC (2-digit)	URCS	Hybrid-URCS	Hybrid-CA1	Hybrid-CA2	Hybrid-CA3
Corn	01	1.70	1.63	1.73	2.35	2.18
Other Farm Products	01	1.40	1.60	1.71	2.31	2.12
Soybeans	01	1.84	1.67	1.79	2.40	2.27
Wheat	01	2.08	1.96	2.10	2.81	2.64
Metallic Ores	10	2.12	1.39	1.45	2.05	1.68
Coal	11	1.52	1.26	1.35	1.82	1.68
Petroleum, Natural Gas, and Gasoline	13	1.41	1.44	1.52	2.06	1.82
Nonmetallic Minerals	14	2.02	1.67	1.76	2.40	2.19
Food Products	20	1.52	1.62	1.71	2.32	2.09
Lumber or Wood Products	24	1.46	1.57	1.64	2.28	1.96
Chemicals	28	1.98	1.88	1.97	2.70	2.36
Petroleum or Coal Products	29	1.81	1.70	1.79	2.45	2.23
Clay, Concrete, Glass, or Stone Products	32	1.91	1.64	1.73	2.34	2.20
Primary Metal Products	33	1.64	1.76	1.85	2.52	2.32
Transportation Equipment	37	1.43	1.53	1.61	2.20	1.92
Other	Various	1.46	1.68	1.79	2.43	2.20

Table D-4. Percent Change in Revenue/Variable Cost Ratio, Hybrid Scenarios Compared to URCS, by Commodity Groups

Commodity	STCC (2-digit)	Hybrid-URCS	Hybrid-CA1	Hybrid-CA2	Hybrid-CA3
Corn	01	-4%	2%	39%	28%
Other Farm Products	01	14%	22%	65%	51%
Soybeans	01	-9%	-3%	31%	24%
Wheat	01	-6%	1%	35%	27%
Metallic Ores	10	-35%	-32%	-4%	-21%
Coal	11	-17%	-11%	20%	11%
Petroleum, Natural Gas, and Gasoline	13	2%	8%	47%	30%
Nonmetallic Minerals	14	-17%	-13%	19%	9%
Food Products	20	6%	12%	53%	37%
Lumber or Wood Products	24	7%	12%	56%	34%
Chemicals	28	-5%	-1%	36%	19%
Petroleum or Coal Products	29	-6%	-1%	36%	23%
Clay, Concrete, Glass, or Stone Products	32	-14%	-9%	23%	15%
Primary Metal Products	33	7%	13%	54%	41%
Transportation Equipment	37	6%	12%	53%	34%
Other	Various	15%	22%	66%	51%

Table D-5. Distribution of 2019 R/VC Ratio by Commodity Groups, Hybrid Model – URCS Variabilities

Commodity	STCC (2-digit)	Share of Tons			Share of Ton-Miles		
		R/VC <1	1<=R/VC <1.8	R/VC >1.8	R/VC <1	1<=R/VC <1.8	R/VC >1.8
Corn	01	5%	61%	34%	2%	71%	27%
Other Farm Products	01	7%	61%	33%	6%	70%	24%
Soybeans	01	5%	57%	38%	1%	57%	41%
Wheat	01	2%	34%	64%	1%	35%	63%
Metallic Ores	10	27%	61%	12%	7%	73%	20%
Coal	11	28%	48%	23%	40%	49%	10%
Petroleum, Natural Gas, and Gasoline	13	2%	87%	11%	1%	90%	9%
Nonmetallic Minerals	14	9%	59%	31%	8%	53%	38%
Food Products	20	12%	55%	33%	10%	57%	33%
Lumber or Wood Products	24	12%	60%	28%	7%	65%	28%
Chemicals	28	10%	41%	48%	9%	45%	46%
Petroleum or Coal Products	29	12%	47%	41%	9%	51%	39%
Clay, Concrete, Glass, or Stone Products	32	10%	52%	38%	9%	57%	35%
Primary Metal Products	33	6%	51%	43%	4%	54%	42%
Transportation Equipment	37	13%	59%	28%	12%	59%	29%
Other	Various	10%	54%	36%	8%	56%	36%
Total		15%	52%	33%	16%	55%	29%

Table D-6. Distribution of 2019 R/VC Ratio by Commodity Groups, Hybrid Model – CA1 Variabilities

Commodity	STCC (2-digit)	Share of Tons			Share of Ton-Miles		
		R/VC <1	1<=R/VC <1.8	R/VC >1.8	R/VC <1	1<=R/VC <1.8	R/VC >1.8
Corn	01	5%	53%	43%	2%	61%	38%
Other Farm Products	01	6%	51%	43%	5%	62%	33%
Soybeans	01	5%	45%	51%	1%	38%	61%
Wheat	01	2%	25%	73%	1%	27%	72%
Metallic Ores	10	27%	53%	20%	6%	64%	30%
Coal	11	21%	52%	27%	31%	57%	12%
Petroleum, Natural Gas, and Gasoline	13	1%	85%	14%	0%	88%	12%
Nonmetallic Minerals	14	7%	56%	36%	6%	48%	46%
Food Products	20	10%	51%	39%	8%	52%	40%
Lumber or Wood Products	24	10%	56%	34%	7%	56%	37%
Chemicals	28	9%	38%	53%	8%	40%	51%
Petroleum or Coal Products	29	11%	41%	48%	8%	45%	47%
Clay, Concrete, Glass, or Stone Products	32	8%	48%	44%	7%	51%	42%
Primary Metal Products	33	4%	46%	50%	3%	46%	50%
Transportation Equipment	37	11%	55%	34%	10%	54%	36%
Other	Various	8%	49%	42%	6%	51%	43%
Total		12%	50%	38%	12%	52%	35%

Table D-7. Distribution of 2019 R/VC Ratio by Commodity Groups, Hybrid Model – CA2 Variabilities

Commodity	STCC (2-digit)	Share of Tons			Share of Ton-Miles		
		R/VC <1	1<=R/VC <1.8	R/VC >1.8	R/VC <1	1<=R/VC <1.8	R/VC >1.8
Corn	01	1%	18%	81%	0%	16%	84%
Other Farm Products	01	2%	18%	80%	1%	19%	80%
Soybeans	01	1%	16%	83%	0%	10%	90%
Wheat	01	0%	8%	92%	0%	7%	93%
Metallic Ores	10	24%	24%	52%	2%	41%	57%
Coal	11	7%	42%	51%	9%	56%	35%
Petroleum, Natural Gas, and Gasoline	13	0%	34%	66%	0%	33%	67%
Nonmetallic Minerals	14	1%	26%	73%	1%	19%	80%
Food Products	20	5%	21%	74%	4%	20%	76%
Lumber or Wood Products	24	3%	20%	76%	4%	12%	85%
Chemicals	28	4%	17%	79%	5%	16%	80%
Petroleum or Coal Products	29	4%	17%	79%	4%	16%	80%
Clay, Concrete, Glass, or Stone Products	32	3%	23%	75%	2%	22%	76%
Primary Metal Products	33	1%	16%	83%	1%	10%	88%
Transportation Equipment	37	4%	26%	70%	4%	22%	75%
Other	Various	3%	23%	75%	2%	20%	78%
Total		5%	27%	69%	4%	28%	68%

Table D-8. Distribution of 2019 R/VC Ratio by Commodity Groups, Hybrid Model – CA3 Variabilities

Commodity	STCC (2-digit)	Share of Tons			Share of Ton-Miles		
		R/VC <1	1<=R/VC <1.8	R/VC >1.8	R/VC <1	1<=R/VC <1.8	R/VC >1.8
Corn	01	2%	26%	73%	0%	23%	76%
Other Farm Products	01	2%	23%	75%	2%	26%	73%
Soybeans	01	1%	30%	69%	0%	20%	79%
Wheat	01	1%	11%	88%	1%	10%	89%
Metallic Ores	10	25%	39%	36%	3%	50%	47%
Coal	11	7%	57%	36%	11%	67%	22%
Petroleum, Natural Gas, and Gasoline	13	0%	53%	47%	0%	58%	42%
Nonmetallic Minerals	14	3%	38%	59%	3%	28%	69%
Food Products	20	5%	31%	64%	5%	30%	65%
Lumber or Wood Products	24	5%	37%	58%	5%	31%	64%
Chemicals	28	5%	26%	68%	6%	26%	68%
Petroleum or Coal Products	29	7%	24%	69%	4%	29%	67%
Clay, Concrete, Glass, or Stone Products	32	4%	31%	65%	3%	30%	67%
Primary Metal Products	33	2%	26%	72%	2%	20%	78%
Transportation Equipment	37	6%	38%	57%	6%	33%	61%
Other	Various	4%	33%	63%	4%	31%	65%
Total		6%	39%	56%	6%	39%	55%

APPENDIX E. COSTS AND R/VC RATIOS BY COMMODITY FROM MODIFIED URCS MODELS

Table E-1. 2019 Variable Cost Per Ton-Mile (2019 Cents) by Commodity Groups, 431s4 Modified URCS Scenarios

	VCPTM (2019 Cents)			
Commodity Group	URCS	431s4	CA1 + 431s4	CA2 + 431s4
01 Farm Products	2.04	2.06	1.94	1.42
10 Metallic Ores	2.59	2.74	2.49	1.77
11 Coal	1.43	1.46	1.34	.98
13 Crude Petroleum, Natural Gas or Gasoline	1.98	2.	1.87	1.39
14 Nonmetallic Minerals; except Fuels	2.22	2.19	2.03	1.48
20 Food or Kindred Products	2.69	2.69	2.48	1.83
24 Lumber or Wood Products	3.16	3.14	2.95	2.02
26 Pulp, Paper or Allied Products	3.84	3.82	3.58	2.5
28 Chemicals or Allied Products	2.49	2.53	2.32	1.69
29 Petroleum or Coal Products	3.13	3.15	2.85	2.08
32 Clay, Concrete, Glass or Stone Products	2.85	2.89	2.61	1.9
33 Primary Metal Products	3.59	3.53	3.28	2.3
37 Transportation Equipment	9.46	9.57	8.87	6.43
40 Waste or Scrap Materials Not Identified by Producing Industry	3.36	3.26	3.04	2.27
42 Containers, Carriers or Devices, Shipping, Returned Empty	10.09	10.17	9.62	7.56
46 Miscellaneous Mixed Shipments	3.79	3.8	3.59	2.78
99 Other	4.08	4.08	3.86	2.93

Table E-2. Percent Change in Variable Cost Per Ton-Mile, Modified 431s4 URCS Scenarios vs. URCS, by Commodity Groups

Commodity Group	VCPTM % Change Vs URCS		
	431s4	CA1 + 431s4	CA2 + 431s4
01 Farm Products	1%	-5%	-30%
10 Metallic Ores	6%	-4%	-32%
11 Coal	2%	-6%	-32%
13 Crude Petroleum, Natural Gas or Gasoline	1%	-6%	-30%
14 Nonmetallic Minerals; except Fuels	-1%	-9%	-33%
20 Food or Kindred Products	0%	-8%	-32%
24 Lumber or Wood Products	-1%	-7%	-36%
26 Pulp, Paper or Allied Products	-1%	-7%	-35%
28 Chemicals or Allied Products	2%	-7%	-32%
29 Petroleum or Coal Products	1%	-9%	-33%
32 Clay, Concrete, Glass or Stone Products	1%	-8%	-33%
33 Primary Metal Products	-2%	-9%	-36%
37 Transportation Equipment	1%	-6%	-32%
40 Waste or Scrap Materials Not Identified by Producing Industry	-3%	-10%	-32%
42 Containers, Carriers or Devices, Shipping, Returned Empty	1%	-5%	-25%
46 Miscellaneous Mixed Shipments	0%	-5%	-27%
99 Other	0%	-6%	-28%

Table E-3. 2019 Revenue/Variable Cost Ratio by Commodity Groups, 431s4 Modified URCS Scenarios

Commodity Group	R/VC URCS	431s4	CA1 + 431s4	CA2 + 431s4
01 Farm Products	1.77	1.75	1.86	2.54
10 Metallic Ores	2.09	1.97	2.17	3.06
11 Coal	1.51	1.48	1.61	2.2
13 Crude Petroleum, Natural Gas or Gasoline	1.46	1.45	1.55	2.09
14 Nonmetallic Minerals; except Fuels	2.04	2.06	2.23	3.06
20 Food or Kindred Products	1.54	1.54	1.67	2.26
24 Lumber or Wood Products	1.46	1.47	1.57	2.29
26 Pulp, Paper or Allied Products	1.43	1.44	1.54	2.2
28 Chemicals or Allied Products	1.95	1.92	2.1	2.88
29 Petroleum or Coal Products	1.83	1.81	2.01	2.74
32 Clay, Concrete, Glass or Stone Products	1.91	1.88	2.08	2.86
33 Primary Metal Products	1.64	1.67	1.79	2.56
37 Transportation Equipment	1.43	1.41	1.52	2.1
40 Waste or Scrap Materials Not Identified by Producing Industry	1.64	1.69	1.82	2.43
42 Containers, Carriers or Devices, Shipping, Returned Empty	.9	.89	.94	1.2
46 Miscellaneous Mixed Shipments	1.4	1.4	1.48	1.91
99 Other	1.86	1.86	1.97	2.59

Table E-4. Percent Change in Revenue/Variable Cost Ratio, 431s4 Modified URCS Scenarios vs. URCS, by Commodity Groups

Commodity Group	R/VC% Change Vs URCS		
	431s4	CA1 + 431s4	CA2 + 431s4
01 Farm Products	-1%	6%	44%
10 Metallic Ores	-6%	4%	46%
11 Coal	-2%	7%	46%
13 Crude Petroleum, Natural Gas or Gasoline	-1%	6%	43%
14 Nonmetallic Minerals; except Fuels	1%	9%	50%
20 Food or Kindred Products	0%	9%	47%
24 Lumber or Wood Products	1%	7%	57%
26 Pulp, Paper or Allied Products	1%	7%	54%
28 Chemicals or Allied Products	-2%	7%	47%
29 Petroleum or Coal Products	-1%	10%	50%
32 Clay, Concrete, Glass or Stone Products	-1%	9%	50%
33 Primary Metal Products	2%	9%	56%
37 Transportation Equipment	-1%	7%	47%
40 Waste or Scrap Materials Not Identified by Producing Industry	3%	11%	48%
42 Containers, Carriers or Devices, Shipping, Returned Empty	-1%	5%	34%
46 Miscellaneous Mixed Shipments	0%	5%	36%
99 Other	0%	6%	39%

Table E-5. 2019 Variable Cost Per Ton-Mile (2019 Cents) by Commodity Groups, 30/70 Modified URCS Scenarios

Commodity Group	VCPTM (2019 Cents) URCS	431s4	CA1 + 431s4	CA2 + 431s4
01 Farm Products	2.04	2.11	1.98	1.46
10 Metallic Ores	2.59	3.12	2.81	1.99
11 Coal	1.43	1.53	1.4	1.02
13 Crude Petroleum, Natural Gas or Gasoline	1.98	2.03	1.89	1.41
14 Nonmetallic Minerals; except Fuels	2.22	2.29	2.11	1.55
20 Food or Kindred Products	2.69	2.6	2.4	1.79
24 Lumber or Wood Products	3.16	3.02	2.84	1.97
26 Pulp, Paper or Allied Products	3.84	3.68	3.47	2.43
28 Chemicals or Allied Products	2.49	2.44	2.25	1.66
29 Petroleum or Coal Products	3.13	2.99	2.72	2.01
32 Clay, Concrete, Glass or Stone Products	2.85	2.73	2.49	1.83
33 Primary Metal Products	3.59	3.39	3.17	2.24
37 Transportation Equipment	9.46	9.14	8.52	6.24
40 Waste or Scrap Materials Not Identified by Producing Industry	3.36	3.19	2.98	2.25
42 Containers, Carriers or Devices, Shipping, Returned Empty	10.09	10.16	9.61	7.55
46 Miscellaneous Mixed Shipments	3.79	3.8	3.59	2.78
99 Other	4.08	4.08	3.86	2.93

Table E-6. Percent Change in Variable Cost Per Ton-Mile (2019 Cents), 30/70 Modified URCS Scenarios vs. URCS, by Commodity Groups

	VCPTM % Change Vs URCS		
Commodity Group	30/70	CA1 + 30/70	CA2 + 30/70
01 Farm Products	3%	-3%	-29%
10 Metallic Ores	20%	8%	-23%
11 Coal	7%	-2%	-28%
13 Crude Petroleum, Natural Gas or Gasoline	2%	-5%	-29%
14 Nonmetallic Minerals; except Fuels	3%	-5%	-30%
20 Food or Kindred Products	-4%	-11%	-33%
24 Lumber or Wood Products	-4%	-10%	-38%
26 Pulp, Paper or Allied Products	-4%	-10%	-37%
28 Chemicals or Allied Products	-2%	-10%	-33%
29 Petroleum or Coal Products	-4%	-13%	-36%
32 Clay, Concrete, Glass or Stone Products	-4%	-13%	-36%
33 Primary Metal Products	-6%	-12%	-38%
37 Transportation Equipment	-3%	-10%	-34%
40 Waste or Scrap Materials Not Identified by Producing Industry	-5%	-11%	-33%
42 Containers, Carriers or Devices, Shipping, Returned Empty	1%	-5%	-25%
46 Miscellaneous Mixed Shipments	0%	-5%	-27%
99 Other	0%	-6%	-28%

Table E-7. 2019 Revenue/Variable Cost Ratio by Commodity Groups, 30/70 Modified URCS Scenarios

	R/VC			
Commodity Group	URCS	30/70	CA1 + 30/70	CA2 + 30/70
01 Farm Products	1.77	1.71	1.83	2.48
10 Metallic Ores	2.09	1.74	1.93	2.72
11 Coal	1.51	1.4	1.54	2.11
13 Crude Petroleum, Natural Gas or Gasoline	1.46	1.43	1.53	2.06
14 Nonmetallic Minerals; except Fuels	2.04	1.98	2.15	2.92
20 Food or Kindred Products	1.54	1.59	1.72	2.3
24 Lumber or Wood Products	1.46	1.53	1.62	2.35
26 Pulp, Paper or Allied Products	1.43	1.5	1.59	2.27
28 Chemicals or Allied Products	1.95	1.99	2.17	2.93
29 Petroleum or Coal Products	1.83	1.91	2.1	2.84
32 Clay, Concrete, Glass or Stone Products	1.91	1.99	2.18	2.96
33 Primary Metal Products	1.64	1.74	1.86	2.63
37 Transportation Equipment	1.43	1.48	1.59	2.16
40 Waste or Scrap Materials Not Identified by Producing Industry	1.64	1.73	1.85	2.46
42 Containers, Carriers or Devices, Shipping, Returned Empty	.9	.89	.94	1.2
46 Miscellaneous Mixed Shipments	1.4	1.4	1.48	1.91
99 Other	1.86	1.86	1.97	2.59

Table E-8. Percent Change in Revenue/Variable Cost Ratio, 30/70 Modified URCS Scenarios vs. URCS, by Commodity Groups

Commodity Group	R/VC% Change Vs URCS 30/70	CA1 + 30/70	CA2 + 30/70
01 Farm Products	-3%	3%	40%
10 Metallic Ores	-17%	-8%	30%
11 Coal	-7%	2%	40%
13 Crude Petroleum, Natural Gas or Gasoline	-2%	5%	41%
14 Nonmetallic Minerals; except Fuels	-3%	5%	43%
20 Food or Kindred Products	4%	12%	50%
24 Lumber or Wood Products	5%	11%	61%
26 Pulp, Paper or Allied Products	4%	11%	58%
28 Chemicals or Allied Products	2%	11%	50%
29 Petroleum or Coal Products	5%	15%	55%
32 Clay, Concrete, Glass or Stone Products	4%	14%	55%
33 Primary Metal Products	6%	13%	61%
37 Transportation Equipment	4%	11%	52%
40 Waste or Scrap Materials Not Identified by Producing Industry	5%	13%	50%
42 Containers, Carriers or Devices, Shipping, Returned Empty	-1%	5%	34%
46 Miscellaneous Mixed Shipments	0%	5%	36%
99 Other	0%	6%	39%

Table E-9. Percent of Tons Over 180 Percent R/VC, 431s4 Modified URCS Scenarios, by Commodity Groups

Commodity Group	URCS	431s4	CA1 + 431s4	CA2 + 431s4
01 Farm Products	55%	53%	60%	87%
10 Metallic Ores	63%	62%	63%	77%
11 Coal	39%	38%	43%	68%
13 Crude Petroleum, Natural Gas or Gasoline	17%	17%	21%	68%
14 Nonmetallic Minerals; except Fuels	68%	65%	72%	91%
20 Food or Kindred Products	36%	35%	46%	79%
24 Lumber or Wood Products	39%	37%	43%	81%
26 Pulp, Paper or Allied Products	36%	36%	40%	74%
28 Chemicals or Allied Products	57%	55%	63%	85%
29 Petroleum or Coal Products	54%	56%	66%	88%
32 Clay, Concrete, Glass or Stone Products	60%	59%	70%	91%
33 Primary Metal Products	41%	43%	50%	82%
37 Transportation Equipment	31%	29%	36%	63%
40 Waste or Scrap Materials Not Identified by Producing Industry	40%	45%	49%	79%
42 Containers, Carriers or Devices, Shipping, Returned Empty	9%	8%	9%	16%
46 Miscellaneous Mixed Shipments	22%	22%	25%	47%
99 Other	43%	43%	46%	69%

Table E-10. Percent of Tons Over 180 Percent R/VC, 431s4 Modified URCS Scenarios, by Commodity Groups

Commodity Group	URCS	30/70	CA1 + 30/70	CA2 + 30/70
01 Farm Products	55%	49%	58%	87%
10 Metallic Ores	63%	47%	64%	76%
11 Coal	39%	34%	38%	66%
13 Crude Petroleum, Natural Gas or Gasoline	17%	15%	20%	62%
14 Nonmetallic Minerals; except Fuels	68%	55%	63%	89%
20 Food or Kindred Products	36%	41%	50%	79%
24 Lumber or Wood Products	39%	40%	48%	84%
26 Pulp, Paper or Allied Products	36%	39%	45%	78%
28 Chemicals or Allied Products	57%	59%	65%	86%
29 Petroleum or Coal Products	54%	59%	72%	90%
32 Clay, Concrete, Glass or Stone Products	60%	65%	76%	91%
33 Primary Metal Products	41%	47%	53%	82%
37 Transportation Equipment	31%	33%	39%	68%
40 Waste or Scrap Materials Not Identified by Producing Industry	40%	48%	54%	80%
42 Containers, Carriers or Devices, Shipping, Returned Empty	9%	8%	9%	16%
46 Miscellaneous Mixed Shipments	22%	22%	25%	47%
99 Other	43%	43%	47%	69%

Table E-11. Percent of Tons Under 100 Percent R/VC, 431s4 Modified URCS Scenarios, by Commodity Groups

Commodity Group	URCS	431s4	CA1 + 431s4	CA2 + 431s4
01 Farm Products	5%	5%	4%	1%
10 Metallic Ores	23%	23%	23%	15%
11 Coal	16%	18%	11%	4%
13 Crude Petroleum, Natural Gas or Gasoline	1%	1%	0%	0%
14 Nonmetallic Minerals; except Fuels	4%	4%	3%	0%
20 Food or Kindred Products	11%	11%	8%	5%
24 Lumber or Wood Products	9%	9%	6%	2%
26 Pulp, Paper or Allied Products	15%	15%	11%	4%
28 Chemicals or Allied Products	9%	9%	7%	4%
29 Petroleum or Coal Products	5%	7%	3%	1%
32 Clay, Concrete, Glass or Stone Products	5%	6%	3%	2%
33 Primary Metal Products	13%	10%	5%	0%
37 Transportation Equipment	18%	20%	14%	6%
40 Waste or Scrap Materials Not Identified by Producing Industry	8%	7%	4%	1%
42 Containers, Carriers or Devices, Shipping, Returned Empty	54%	56%	50%	32%
46 Miscellaneous Mixed Shipments	30%	30%	25%	13%
99 Other	16%	16%	13%	7%

Table E-12. Percent of Tons Under 100 Percent R/VC, 431s4 Modified URCS Scenarios, by Commodity Groups

Commodity Group	URCS	30/70	CA1 + 30/70	CA2 + 30/70
01 Farm Products	5%	5%	4%	1%
10 Metallic Ores	23%	23%	23%	23%
11 Coal	16%	22%	14%	5%
13 Crude Petroleum, Natural Gas or Gasoline	1%	2%	0%	0%
14 Nonmetallic Minerals; except Fuels	4%	4%	4%	0%
20 Food or Kindred Products	11%	9%	8%	5%
24 Lumber or Wood Products	9%	6%	5%	3%
26 Pulp, Paper or Allied Products	15%	12%	11%	4%
28 Chemicals or Allied Products	9%	8%	6%	3%
29 Petroleum or Coal Products	5%	4%	2%	1%
32 Clay, Concrete, Glass or Stone Products	5%	3%	3%	2%
33 Primary Metal Products	13%	7%	3%	0%
37 Transportation Equipment	18%	17%	13%	5%
40 Waste or Scrap Materials Not Identified by Producing Industry	8%	6%	4%	1%
42 Containers, Carriers or Devices, Shipping, Returned Empty	54%	55%	50%	32%
46 Miscellaneous Mixed Shipments	30%	30%	25%	13%
99 Other	16%	15%	13%	7%

APPENDIX F. ESTIMATION OF PHASE I MODELS BY RAILROAD SIZE AND REGION GROUPS

In Section III.D.2, we presented updated URCS Phase I regression estimates, which quantify the variability of disaggregated cost pools with respect to output. In that approach, variabilities are restricted to be constant across railroads in our preferred log-log specification. In this section, we relax that restriction by allowing the output and network variabilities to depend on the railroad's region or size.

Our regressions take the form

$$\text{(F-I)} \qquad lnE_{jt}^{k} = \beta_0^k + \beta_1^k Type_j + \beta_{0Q}^k lnQ_{jt}^k + \beta_{1Q}^k lnQ_{jt}^k Type_j + \beta_{0N}^k lnN_{jt}^k + \beta_{1N}^k lnN_{jt}^k Type_j + \sum_p \delta_p^k T_{p,t} + \epsilon_{jt}^k$$

where $\text{Type} \in [\text{West}, \text{Large}]$. Of particular interest is the coefficient β_{1Q}^k, which quantifies the difference in the output variability between railroads of different types. For instance, for $\text{Type} = \text{West}$, β_{1Q}^k is the output variability of western railroads minus the output variability of eastern railroads.

We use R-1 annual report data from 1990 to 2019 and estimate our regressions using the GLS estimator, described in Section III.D.2. For our regressions with region-specific effects, we classify ATSF, BN, BNSF, CNW, DRGW, KCS, CP, SP, and UP as western railroads, and CR, CN, NS, FEC, IC, and CSX as eastern railroads. For our regressions with size-specific effects, we classify ATSF, BN, SP, CR, BNSF, UP, CSX, and NS as large railroads and the rest as small railroads.

A summary of our estimates for our regressions with region-specific effects can be found in Table F-1. The point estimates suggest lower output elasticities for western railroads. However, most of these estimates are statistically insignificant, except for Running Track Maintenance and Overhead, Yard Operations, Switching Crew Wages, and Yard Locomotive Repairs. Our regressions in Table F-2 with size-specific effects show even fewer statistically significant differences, with the Transportation Overhead and Yard Operations regressions showing the only differences in output variabilities between large and small railroads that can be confirmed by the data. With evidence of some measurement error in these disaggregated cost pool data, it is difficult to be confident that a few statistically significant differences signify true underlying differences in variabilities for groups of railroads. If such differences exist, we conclude that the data cannot sufficiently parse them out and use our log-log constant effects specification to derive unit costs.

Table F-1: Cost Pool Regression Summary with Region-Specific Effects

	Log(Q), east	Log(N), east	Log(Q), west	Log(N), west	ΔLog(Q)	ΔLog(N)	Obs
Running Track Maintenance and Overhead	0.69	0.25	0.37	0.58	-0.32*	0.33*	254
	(0.08)	(0.09)	(0.09)	(0.12)	(0.12)	(0.15)	
Running Crew Wages	0.82	0.17	0.83	0.21	0.01	0.04	254
	(0.05)	(0.05)	(0.06)	(0.08)	(0.08)	(0.10)	
Transportation Overhead	0.73	0.30	0.62	0.27	-0.11	-0.03	253
	(0.24)	(0.26)	(0.19)	(0.25)	(0.30)	(0.36)	
Transportation Fuel Expenses	0.94	0.04	0.84	0.18	-0.10	0.15	254
	(0.07)	(0.08)	(0.03)	(0.04)	(0.07)	(0.09)	
Road Locomotive Service and Repair	0.77	0.44	0.63	0.43	-0.14	-0.01	254
	(0.05)	(0.08)	(0.08)	(0.10)	(0.10)	(0.13)	
Road Train Inspection	0.73	0.25	0.49	0.56	-0.24	0.31	254
	(0.08)	(0.11)	(0.13)	(0.17)	(0.15)	(0.20)	
Wreck Clearing	0.45	0.48	0.69	0.34	0.25	-0.14	224
	(0.17)	(0.20)	(0.29)	(0.39)	(0.34)	(0.44)	
Switching Maintenance and Overhead	0.57	0.63	0.31	0.70	-0.26	0.07	232
	(0.17)	(0.30)	(0.15)	(0.17)	(0.23)	(0.34)	
Yard Operations	0.83	0.16	0.20	0.67	-0.62*	0.51*	254
	(0.09)	(0.15)	(0.08)	(0.12)	(0.12)	(0.19)	
Switching Crew Wages	0.66	0.39	0.45	0.56	-0.21*	0.16	254
	(0.06)	(0.10)	(0.06)	(0.07)	(0.08)	(0.12)	
Yard Locomotive Repairs	0.71	0.53	0.31	0.84	-0.41*	0.31	232
	(0.07)	(0.18)	(0.13)	(0.16)	(0.15)	(0.24)	
Carload Related Expenses	0.27	0.44	-0.07	0.82	-0.34	0.38	218
	(0.29)	(0.37)	(0.33)	(0.31)	(0.43)	(0.48)	
General and Administrative	1.00	0.01	0.70	0.17	-0.30	0.17	254
	(0.16)	(0.16)	(0.11)	(0.13)	(0.19)	(0.20)	
Freight Car Repair Expenses and Overhead	0.71	0.20	0.54	0.56	-0.17	0.36*	254
	(0.12)	(0.12)	(0.11)	(0.14)	(0.16)	(0.18)	

Note: Standard errors are in parenthesis. ΔLog(Q) = Log(Q), west - Log(Q), east and is equal to β_{1Q}^{k} from Equation F-1.

Table F-2: Cost Pool Regression Summary with Size-Specific Effects

	Log(Q), small	Log(N), small	Log(Q), large	Log(N), large	ΔLog(Q)	ΔLog(N)	Obs
Running Track Maintenance and Overhead	0.50	0.44	0.57	0.42	0.07	-0.03	254
	(0.14)	(0.12)	(0.08)	(0.11)	(0.16)	(0.17)	
Running Crew Wages	0.73	0.24	0.84	0.28	0.12	0.04	254
	(0.09)	(0.08)	(0.05)	(0.07)	(0.10)	(0.10)	
Transportation Overhead	0.29	0.38	0.95	0.24	0.66*	-0.14	253
	(0.28)	(0.26)	(0.19)	(0.21)	(0.33)	(0.34)	
Transportation Fuel Expenses	0.87	0.17	0.95	0.15	0.08	-0.03	254
	(0.06)	(0.05)	(0.03)	(0.04)	(0.07)	(0.06)	
Road Locomotive Service and Repair	0.46	0.70	0.71	0.38	0.25	-0.32*	254
	(0.14)	(0.12)	(0.05)	(0.09)	(0.15)	(0.15)	
Road Train Inspection	0.40	0.51	0.71	0.31	0.31	-0.20	254
	(0.18)	(0.21)	(0.08)	(0.10)	(0.20)	(0.23)	
Wreck Clearing	0.48	0.68	0.58	0.33	0.10	-0.35	224
	(0.56)	(0.41)	(0.15)	(0.24)	(0.57)	(0.48)	
Switching Maintenance and Overhead	0.10	0.54	0.44	0.54	0.35	-0.01	232
	(0.27)	(0.32)	(0.13)	(0.19)	(0.29)	(0.37)	
Yard Operations	0.13	0.62	0.46	0.28	0.33*	-0.34	254
	(0.10)	(0.16)	(0.08)	(0.11)	(0.13)	(0.19)	
Switching Crew Wages	0.47	0.37	0.54	0.45	0.07	0.08	254
	(0.07)	(0.11)	(0.06)	(0.07)	(0.09)	(0.13)	
Yard Locomotive Repairs	0.41	0.24	0.63	0.68	0.22	0.44	232
	(0.26)	(0.40)	(0.07)	(0.12)	(0.27)	(0.42)	
Carload Related Expenses	-0.02	1.06	0.13	-0.29	0.15	-1.35*	218
	(0.43)	(0.37)	(0.25)	(0.30)	(0.49)	(0.48)	
General and Administrative	0.49	0.29	0.17	0.41	-0.33	0.12	254
	(0.20)	(0.16)	(0.19)	(0.29)	(0.26)	(0.33)	
Freight Car Repair Expenses and Overhead	0.66	0.17	0.64	0.39	-0.02	0.21	254
	(0.16)	(0.16)	(0.10)	(0.13)	(0.19)	(0.20)	

Note: Standard errors are in parenthesis. ΔLog(Q) = Log(Q), large - Log(Q), small and is equal to β_{1Q}^{k} from Equation F-1.

Table F-3.1: Cost Pool Regressions with Region-Specific Effects

	Running Track Maintenance and Overhead	Running Crew Wages	Transportation Overhead	Transportation Fuel Expenses	Road Locomotive Service and Repair
Intercept	103.14	73.82	66.38	-14.76	46.26
	(14.92)	(10.97)	(35.36)	(6.93)	(13.15)
West	-1.79	-0.56	1.07	-0.89	0.59
	(0.90)	(0.56)	(2.05)	(0.55)	(0.90)
Log(Q)	0.69	0.82	0.73	0.94	0.77
	(0.08)	(0.05)	(0.24)	(0.07)	(0.05)
Log(N)	0.25	0.17	0.30	0.04	0.44
	(0.09)	(0.05)	(0.26)	(0.08)	(0.08)
West*Log(Q)	-0.32	0.01	-0.11	-0.10	-0.14
	(0.12)	(0.08)	(0.30)	(0.07)	(0.10)
West*Log(N)	0.33	0.04	-0.03	0.15	-0.01
	(0.15)	(0.10)	(0.36)	(0.09)	(0.13)
Year	-0.05	-0.04	-0.03	0.01	-0.02
	(0.01)	(0.01)	(0.02)	(0.00)	(0.01)
Post-merger	-97.84	-82.56	-41.53	10.49	-61.36
	(28.30)	(21.33)	(71.59)	(15.04)	(26.43)
Post-GR	-102.60	-89.07	-90.23	4.94	-51.31
	(20.84)	(15.95)	(51.80)	(10.22)	(19.68)
Post-merger *Year	0.05	0.04	0.02	-0.01	0.03
	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)
Post-GR*Year	0.05	0.04	0.05	0.00	0.03
	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
observations	254	254	253	254	254

Table F-3.2: Cost Pool Regressions with Region-Specific Effects

	Road Train Inspection	Wreck Clearing	Switching Maintenance and Overhead	Yard Operations	Switching Crew Wages
Intercept	80.38	1.64	46.98	45.88	27.97
	(19.60)	(36.62)	(34.97)	(22.05)	(13.50)
West	-2.09	-0.17	2.28	0.28	0.23
	(1.51)	(2.52)	(2.70)	(1.40)	(0.81)
Log(Q)	0.73	0.45	0.57	0.83	0.66
	(0.08)	(0.17)	(0.17)	(0.09)	(0.06)
Log(N)	0.25	0.48	0.63	0.16	0.39
	(0.11)	(0.20)	(0.30)	(0.15)	(0.10)
West*Log(Q)	-0.24	0.25	-0.26	-0.62	-0.21
	(0.15)	(0.34)	(0.23)	(0.12)	(0.08)
West*Log(N)	0.31	-0.14	0.07	0.51	0.16
	(0.20)	(0.44)	(0.34)	(0.19)	(0.12)
Year	-0.04	0.00	-0.03	-0.02	-0.02
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Post-merger	-66.26	32.70	-105.86	6.32	-2.36
	(34.36)	(74.98)	(61.83)	(40.82)	(25.29)
Post-GR	-27.75	-43.48	-116.63	-41.19	-21.75
	(29.73)	(53.82)	(53.17)	(35.49)	(21.48)
Post-merger *Year	0.03	-0.02	0.05	0.00	0.00
	(0.02)	(0.04)	(0.03)	(0.02)	(0.01)
Post-GR*Year	0.01	0.02	0.06	0.02	0.01
	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)
observations	254	224	232	254	254

Table F-3.3: Cost Pool Regressions with Region-Specific Effects

	Yard Locomotive Repairs	Carload Related Expenses	General and Administrative	Freight Car Repair Expenses and Overhead
Intercept	-37.58	-32.12	87.60	99.24
	(26.20)	(54.93)	(20.97)	19.54
West	0.41	-0.56	-0.69	-2.47
	(1.77)	(3.31)	(1.02)	0.97
Log(Q)	0.71	0.27	1.00	0.71
	(0.07)	(0.29)	(0.16)	0.12
Log(N)	0.53	0.44	0.01	0.20
	(0.18)	(0.37)	(0.16)	0.12
West*Log(Q)	-0.41	-0.34	-0.30	-0.17
	(0.15)	(0.43)	(0.19)	0.16
West*Log(N)	0.31	0.38	0.17	0.36
	(0.24)	(0.48)	(0.20)	0.18
Year	0.02	0.01	-0.04	-0.05
	(0.01)	(0.03)	(0.01)	0.01
Post-merger	63.69	109.53	-61.49	-124.35
	(53.59)	(91.19)	(39.85)	39.55
Post-GR	132.30	-4.57	-78.55	-71.95
	(44.94)	(79.97)	(27.47)	30.56
Post-merger *Year	-0.03	-0.05	0.03	0.06
	(0.03)	(0.05)	(0.02)	0.02
Post-GR*Year	-0.07	0.00	0.04	0.04
	(0.02)	(0.04)	(0.01)	0.02
observations	232	218	254	254

Table F-4.1: Cost Pool Regressions with Size-Specific Effects

	Running Track Maintenance and Overhead	Running Crew Wages	Transportation Overhead	Transportation Fuel Expenses	Road Locomotive Service and Repair
Intercept	103.94	76.26	92.95	-8.54	47.47
	(18.78)	(12.38)	(34.93)	(6.39)	(15.19)
Large	-0.03	-1.08	-2.49	-0.25	1.84
	(1.17)	(0.72)	(2.13)	(0.46)	(1.07)
Log(Q)	0.50	0.73	0.29	0.87	0.46
	(0.14)	(0.09)	(0.28)	(0.06)	(0.14)
Log(N)	0.44	0.24	0.38	0.17	0.70
	(0.12)	(0.08)	(0.26)	(0.05)	(0.12)
Large*Log(Q)	0.07	0.12	0.66	0.08	0.25
	(0.16)	(0.10)	(0.33)	(0.07)	(0.15)
Large*Log(N)	-0.03	0.04	-0.14	-0.03	-0.32
	(0.17)	(0.10)	(0.34)	(0.06)	(0.15)
Year	-0.05	-0.04	-0.05	0.00	-0.03
	(0.01)	(0.01)	(0.02)	(0.00)	(0.01)
Post-merger	-94.48	-77.22	-51.83	11.11	-61.24
	(33.30)	(23.06)	(69.30)	(14.08)	(29.16)
Post-GR	-107.04	-91.23	-122.17	-3.09	-53.20
	(26.97)	(18.20)	(51.80)	(9.81)	(22.82)
Post-merger*Year	0.05	0.04	0.03	-0.01	0.03
	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)
Post-GR*Year	0.05	0.05	0.06	0.00	0.03
	(0.01)	(0.01)	(0.03)	(0.00)	(0.01)
observations	254	254	253	254	254

Table F-4.2: Cost Pool Regressions with Size-Specific Effects

	Road Train Inspection	Wreck Clearing	Switching Maintenance and Overhead	Yard Operations	Switching Crew Wages
Intercept	84.91	-14.79	69.10	61.72	25.77
	(20.40)	(37.46)	(37.84)	(18.63)	(13.16)
Large	0.57	2.69	-1.96	1.49	-0.75
	(1.76)	(2.81)	(2.41)	(1.26)	(0.80)
Log(Q)	0.40	0.48	0.10	0.13	0.47
	(0.18)	(0.56)	(0.27)	(0.10)	(0.07)
Log(N)	0.51	0.68	0.54	0.62	0.37
	(0.21)	(0.41)	(0.32)	(0.16)	(0.11)
Large*Log(Q)	0.31	0.10	0.35	0.33	0.07
	(0.20)	(0.57)	(0.29)	(0.13)	(0.09)
Large*Log(N)	-0.20	-0.35	-0.01	-0.34	0.08
	(0.23)	(0.48)	(0.37)	(0.19)	(0.13)
Year	-0.04	0.00	-0.04	-0.03	-0.01
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Post-merger	-77.69	56.36	-108.47	-12.29	-0.43
	(34.77)	(76.58)	(63.84)	(40.16)	(24.80)
Post-GR	-37.35	-32.43	-131.52	-51.95	-17.82
	(30.52)	(54.77)	(57.20)	(33.96)	(20.99)
Post-merger*Year	0.04	-0.03	0.05	0.01	0.00
	(0.02)	(0.04)	(0.03)	(0.02)	(0.01)
Post-GR*Year	0.02	0.02	0.07	0.03	0.01
	(0.02)	(0.03)	(0.03)	(0.02)	(0.01)
observations	254	224	232	254	254

Table F-4.3: Cost Pool Regressions with Size-Specific Effects

	Yard Locomotive Repairs	Carload Related Expenses	General and Administrative	Freight Car Repair Expenses and Overhead
Intercept	-19.18	-57.15	27.56	89.29
	(22.76)	(53.53)	(31.16)	20.42
Large	-4.82	12.96	1.26	-1.60
	(2.66)	(3.28)	(2.33)	1.24
Log(Q)	0.41	-0.02	0.49	0.66
	(0.26)	(0.43)	(0.20)	0.16
Log(N)	0.24	1.06	0.29	0.17
	(0.40)	(0.37)	(0.16)	0.16
Large*Log(Q)	0.22	0.15	-0.33	-0.02
	(0.27)	(0.49)	(0.26)	0.19
Large*Log(N)	0.44	-1.35	0.12	0.21
	(0.42)	(0.48)	(0.33)	0.20
Year	0.01	0.02	-0.01	-0.05
	(0.01)	(0.03)	(0.02)	0.01
Post-merger	74.23	155.20	-13.15	-113.16
	(51.18)	(86.74)	(55.51)	40.73
Post-GR	113.51	12.51	-27.85	-63.82
	(42.25)	(76.28)	(41.29)	32.21
Post-merger*Year	-0.04	-0.08	0.01	0.06
	(0.03)	(0.04)	(0.03)	0.02
Post-GR*Year	-0.06	-0.01	0.01	0.03
	(0.02)	(0.04)	(0.02)	0.02
observations	232	218	254	254