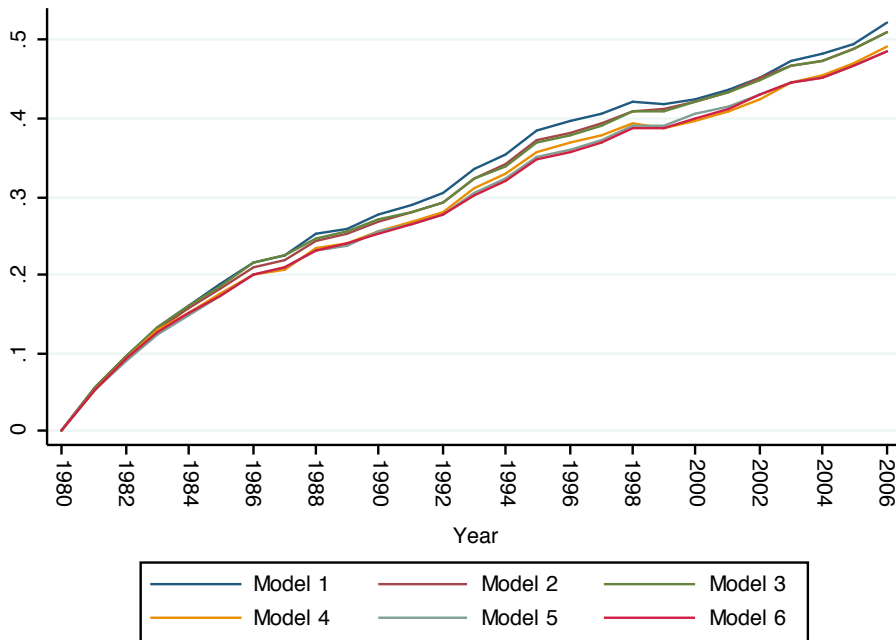


Online Appendix for

Automobiles on Steroids: Product Attribute Trade-Offs and Technological Progress in the Automobile Sector

Christopher R. Knittel

Figure A1: Passenger Car Technological Progress Measures from All Models



	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ln(Weight)	-0.409** (0.051)	-0.373** (0.044)	-0.397** (0.047)	-5.225 (3.625)	-5.259+ (3.050)	-5.566+ (2.989)
ln(HP)	-0.246** (0.035)	-0.266** (0.054)	-0.258** (0.056)	-0.661 (0.765)	-2.093** (0.618)	-1.892** (0.639)
ln(Torque)	-0.090* (0.033)	-0.078+ (0.046)	-0.067 (0.049)	0.296 (1.725)	1.508 (1.367)	1.581 (1.415)
ln(Weight) ²				0.332 (0.305)	0.334 (0.256)	0.361 (0.254)
ln(HP) ²				0.033 (0.102)	-0.014 (0.083)	-0.054 (0.090)
ln(Torque) ²				0.236 (0.223)	0.168 (0.127)	0.138 (0.134)
ln(Weight)*ln(HP)				0.164 (0.160)	0.322* (0.137)	0.299* (0.144)
ln(Weight)*ln(Torque)				-0.230 (0.370)	-0.362 (0.289)	-0.371 (0.302)
ln(HP)*ln(Torque)				-0.225 (0.231)	-0.110 (0.099)	-0.039 (0.108)
Manual	0.085** (0.019)	0.094** (0.020)	0.094** (0.020)	0.084** (0.018)	0.085** (0.019)	0.086** (0.019)
Manual*trend	-0.003* (0.001)	-0.003** (0.001)	-0.003** (0.001)	-0.003** (0.001)	-0.002* (0.001)	-0.002* (0.001)
Diesel	0.216** (0.014)	0.214** (0.018)	0.222** (0.022)	0.212** (0.026)	0.217** (0.028)	0.231** (0.033)
Turbocharged	0.016+ (0.008)	0.048** (0.013)		0.022* (0.008)	0.055** (0.014)	
Supercharged	0.032* (0.014)	0.029 (0.017)		0.021 (0.015)	0.020 (0.019)	
Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Manufacturer Fixed Effects?	No	Yes	Yes	No	Yes	Yes
Observations	13842	13842	13842	13842	13842	13842
R-squared	0.838	0.861	0.859	0.843	0.867	0.864

Notes: ** denotes significance at the one percent level, * at the five percent level, and + at the 10 percent level.
Regressions are weighted using the sales of each vehicle. Sales are reported at the Model level. When more than one trim exists for a model sales are equally apportioned to each trim level.
Standard errors are clustered at the manufacturer level.

Table A1: Trade-Off Estimates for Passenger Cars, Sales-Weighted

Year	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
1981	4.3%	4.5%	4.5%	4.5%	4.4%	4.4%
1982	8.4%	8.7%	8.7%	8.7%	8.5%	8.5%
1983	12.1%	12.5%	12.5%	12.4%	12.2%	12.2%
1984	15.0%	15.3%	15.4%	15.6%	15.3%	15.4%
1985	17.2%	17.5%	17.7%	18.0%	17.6%	17.7%
1986	19.9%	20.2%	20.4%	20.8%	20.3%	20.3%
1987	21.1%	21.4%	21.6%	21.9%	21.6%	21.6%
1988	23.4%	23.7%	23.9%	24.4%	24.0%	24.0%
1989	24.5%	24.6%	24.8%	25.2%	24.7%	24.7%
1990	26.2%	26.1%	26.2%	26.8%	26.2%	26.1%
1991	26.8%	26.8%	26.8%	27.3%	26.7%	26.5%
1992	28.5%	28.8%	28.7%	29.1%	28.7%	28.4%
1993	31.6%	31.8%	31.7%	32.2%	31.6%	31.2%
1994	34.0%	34.0%	33.9%	34.7%	33.9%	33.5%
1995	37.1%	36.9%	36.8%	37.4%	36.6%	36.2%
1996	36.5%	36.7%	36.4%	37.2%	36.5%	36.0%
1997	38.2%	38.1%	37.8%	38.9%	37.9%	37.5%
1998	38.8%	39.3%	39.1%	39.5%	39.1%	38.7%
1999	38.6%	39.4%	39.2%	39.3%	39.3%	38.9%
2000	40.0%	41.0%	40.7%	40.7%	40.8%	40.3%
2001	40.2%	41.3%	41.1%	40.9%	41.1%	40.6%
2002	42.0%	43.3%	43.1%	42.8%	43.1%	42.6%
2003	45.3%	46.3%	46.2%	45.8%	45.9%	45.6%
2004	46.5%	47.7%	47.6%	47.0%	47.1%	46.8%
2005	48.6%	49.7%	49.6%	49.0%	49.0%	48.7%
2006	49.4%	50.6%	50.3%	49.5%	49.4%	49.0%

Table A2: Technological Progress Estimates for Passenger Cars, Sales-Weighted

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ln(Weight)	-0.300** (0.022)	-0.310** (0.027)	-0.309** (0.031)	1.435 (1.200)	2.083* (0.960)	2.048* (0.987)
ln(HP)	-0.096+ (0.050)	-0.145** (0.044)	-0.144** (0.044)	-1.591 (1.578)	-1.889 (1.474)	-1.837 (1.471)
ln(Torque)	-0.306** (0.030)	-0.285** (0.036)	-0.287** (0.033)	0.578 (1.453)	0.646 (1.269)	0.574 (1.261)
ln(Weight) ²				-0.197** (0.053)	-0.237** (0.043)	-0.235** (0.046)
ln(HP) ²				-0.026 (0.177)	-0.004 (0.181)	-0.005 (0.183)
ln(Torque) ²				-0.498* (0.189)	-0.503* (0.192)	-0.494* (0.193)
ln(Weight)*ln(HP)				-0.064 (0.184)	-0.062 (0.180)	-0.062 (0.173)
ln(Weight)*ln(Torque)				0.322 (0.188)	0.321+ (0.178)	0.321+ (0.177)
ln(HP)*ln(Torque)				0.409 (0.363)	0.411 (0.358)	0.404 (0.358)
Manual	0.097** (0.016)	0.091** (0.015)	0.091** (0.016)	0.095** (0.017)	0.089** (0.015)	0.089** (0.015)
Manual*trend	-0.005** (0.001)	-0.005** (0.001)	-0.005** (0.001)	-0.005** (0.001)	-0.005** (0.001)	-0.005** (0.001)
Diesel	0.253** (0.010)	0.226** (0.005)	0.225** (0.009)	0.265** (0.011)	0.243** (0.016)	0.245** (0.016)
Turbocharged	-0.022 (0.049)	-0.016 (0.058)		0.014 (0.026)	0.023 (0.035)	
Supercharged	-0.080** (0.016)	-0.043* (0.016)		-0.085** (0.013)	-0.043** (0.013)	
Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Manufacturer Fixed Effects?	No	Yes	Yes	No	Yes	Yes
Observations	12396	12396	12396	12396	12396	12396
R-squared	0.744	0.758	0.758	0.755	0.770	0.770

Notes: ** denotes significance at the one percent level, * at the five percent level, and + at the 10 percent level.

Regressions are weighted using the sales of each vehicle. Sales are reported at the Model level. When more than one trim exists for a model sales are equally apportioned to each trim level.

Standard errors are clustered at the manufacturer level.

Table A3: Trade-Off Estimates for Passenger Cars, Sales-Weighted

Year	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
1981	5.1%	4.9%	4.9%	4.9%	4.6%	4.6%
1982	7.6%	7.5%	7.5%	7.4%	7.3%	7.3%
1983	9.9%	9.4%	9.4%	9.7%	9.2%	9.2%
1984	8.8%	8.3%	8.3%	8.6%	8.2%	8.2%
1985	12.1%	11.7%	11.7%	11.5%	11.1%	11.1%
1986	14.7%	14.4%	14.4%	13.9%	13.7%	13.7%
1987	14.7%	14.3%	14.3%	14.2%	13.8%	13.8%
1988	19.4%	19.0%	19.0%	18.7%	18.3%	18.3%
1989	19.6%	19.7%	19.7%	18.9%	19.0%	19.1%
1990	19.9%	20.1%	20.1%	19.3%	19.5%	19.5%
1991	21.8%	22.2%	22.2%	21.1%	21.5%	21.5%
1992	24.1%	24.6%	24.6%	23.2%	23.8%	23.8%
1993	24.3%	24.7%	24.7%	23.4%	23.9%	23.9%
1994	25.8%	26.5%	26.5%	25.1%	25.8%	25.9%
1995	26.1%	27.0%	26.9%	25.3%	26.2%	26.3%
1996	26.3%	27.5%	27.4%	27.1%	28.1%	28.3%
1997	29.1%	30.9%	30.8%	29.5%	31.2%	31.3%
1998	30.3%	32.1%	32.0%	29.6%	31.1%	31.2%
1999	31.2%	33.2%	33.2%	30.9%	32.4%	32.5%
2000	35.9%	38.1%	38.1%	33.8%	35.6%	35.7%
2001	33.6%	35.7%	35.7%	31.4%	33.0%	33.0%
2002	33.7%	35.8%	35.8%	31.5%	33.0%	33.1%
2003	34.1%	36.0%	36.0%	31.8%	33.1%	33.2%
2004	39.8%	41.9%	41.8%	37.1%	38.4%	38.4%
2005	44.7%	46.8%	46.8%	41.6%	43.0%	43.1%
2006	49.2%	51.6%	51.5%	46.4%	48.0%	48.1%

Table A4: Technological Progress Estimates for Passenger Cars, Sales-Weighted

Figure A2: Passenger Car Technological Progress Measure from Model 6 with 95 percent Confidence Interval

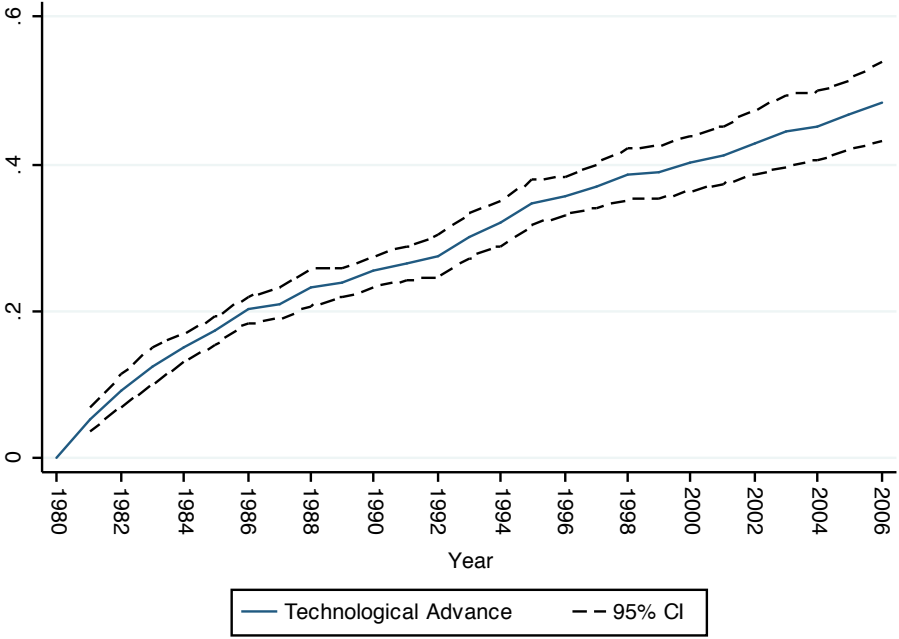


Figure A3: Light Truck Technological Progress Measures from All Models

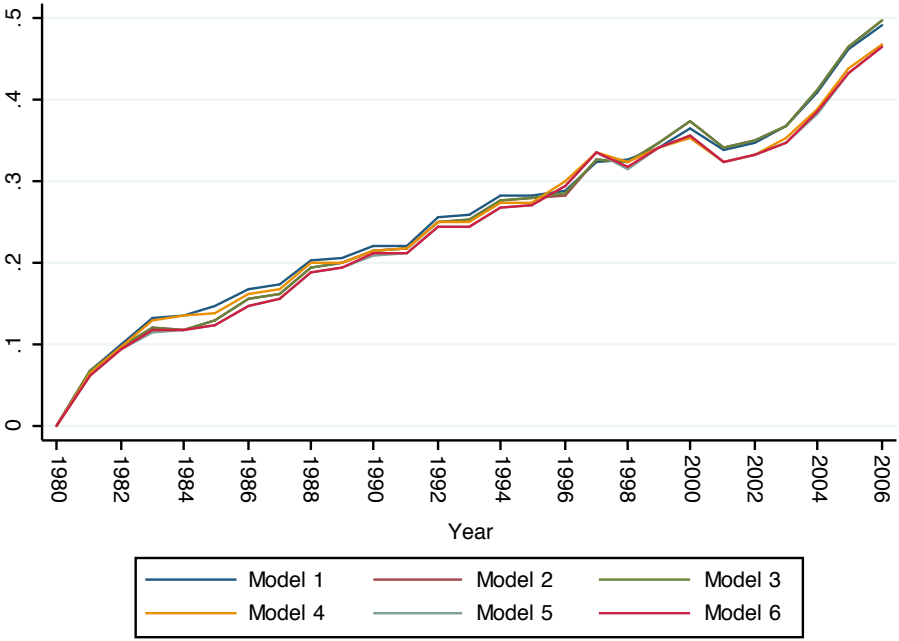


Figure A4: Light Truck Technological Progress Measure from Model 6 with 95 percent Confidence Interval

