

Table 1: Data: Summary statistics

Firm	Segment	Vintage	Output			Price (1983\$)		
			#obs	Avg.	Std Dev	#obs	Avg.	Std Dev
Chrysler	SC	New	20	176,229	68,964	19	5,343.72	342.09
Chrysler	SC	1-yr old	20	179,843	66,768	16	5,105.09	419.14
Chrysler	SC	2-yr old	20	190,098	69,488	18	4,253.51	466.60
Chrysler	SC	3-yr old	20	189,193	74,121	17	3,568.08	396.87
Chrysler	SC	4-yr old	20	188,753	72,850	16	3,063.55	291.90
Chrysler	SC	5-yr old	20	184,808	72,111	15	2,643.06	256.71
Chrysler	SC	6-yr old	20	174,103	64,974	14	2,293.41	230.67
Chrysler	C	New	20	379,322	140,631	20	7,923.04	437.66
Chrysler	C	1-yr old	20	391,722	132,677	19	6,527.01	751.83
Chrysler	C	2-yr old	20	395,166	131,044	20	5,427.19	642.64
Chrysler	C	3-yr old	20	390,232	124,159	20	4,481.99	536.72
Chrysler	C	4-yr old	20	383,729	120,421	20	3,682.76	421.68
Chrysler	C	5-yr old	20	376,428	114,192	20	3,000.50	334.11
Chrysler	C	6-yr old	20	370,341	107,150	20	2,447.50	298.61
Chrysler	MF	New	20	170,582	68,096	20	11,822.32	1,740.91
Chrysler	MF	1-yr old	20	199,392	139,256	19	9,526.12	1,447.80
Chrysler	MF	2-yr old	20	236,975	203,320	20	7,635.53	1,355.18
Chrysler	MF	3-yr old	20	269,987	255,050	20	6,220.20	1,168.07
Chrysler	MF	4-yr old	20	292,566	268,141	20	4,948.58	939.96
Chrysler	MF	5-yr old	20	317,770	292,176	20	3,868.81	886.72
Chrysler	MF	6-yr old	20	333,852	299,637	20	2,912.73	798.18
Ford	SC	New	20	321,990	62,700	20	6,097.58	453.62
Ford	SC	1-yr old	19	325,214	62,692	18	5,327.54	238.91
Ford	SC	2-yr old	18	327,685	63,550	18	4,396.47	221.75
Ford	SC	3-yr old	17	317,619	65,335	17	3,605.96	241.51
Ford	SC	4-yr old	16	311,884	66,315	16	2,989.77	263.66
Ford	SC	5-yr old	15	302,730	65,964	15	2,478.86	247.42
Ford	SC	6-yr old	14	286,906	61,151	14	2,057.81	263.12
Ford	C	New	20	266,789	98,101	20	7,456.69	1,202.51
Ford	C	1-yr old	20	264,061	98,763	17	6,456.03	900.13

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Ford	C	2-yr old	20	251,007	108,871	17	5,293.06	593.23
Ford	C	3-yr old	19	243,572	108,242	17	4,327.12	385.00
Ford	C	4-yr old	18	242,031	109,669	17	3,571.90	328.81
Ford	C	5-yr old	17	236,887	111,233	16	2,923.49	287.83
Ford	C	6-yr old	16	227,425	111,362	15	2,386.99	276.74
Ford	MF	New	20	628,545	266,559	20	9,958.11	630.58
Ford	MF	1-yr old	20	636,433	264,571	19	7,883.81	821.72
Ford	MF	2-yr old	20	642,890	265,867	20	6,364.42	746.82
Ford	MF	3-yr old	20	635,042	256,854	20	5,024.25	819.66
Ford	MF	4-yr old	20	625,235	248,070	20	3,911.49	739.91
Ford	MF	5-yr old	20	615,229	240,050	20	3,085.93	596.31
Ford	MF	6-yr old	20	597,258	229,396	20	2,522.55	553.44
GM	SC	New	20	427,180	109,266	20	6,725.44	874.98
GM	SC	1-yr old	20	427,179	109,266	19	5,851.07	638.68
GM	SC	2-yr old	20	431,277	108,772	18	4,757.20	512.60
GM	SC	3-yr old	20	425,893	104,956	17	3,818.25	394.65
GM	SC	4-yr old	20	420,428	103,868	16	3,047.47	340.27
GM	SC	5-yr old	20	406,804	99,683	15	2,441.59	268.94
GM	SC	6-yr old	20	380,330	85,937	14	1,954.33	254.59
GM	C	New	20	526,866	124,607	20	8,530.14	589.12
GM	C	1-yr old	20	530,705	124,207	20	6,785.69	702.76
GM	C	2-yr old	20	529,519	124,553	20	5,653.27	649.50
GM	C	3-yr old	20	506,363	116,401	20	4,658.94	553.07
GM	C	4-yr old	20	488,013	119,821	20	3,848.30	453.95
GM	C	5-yr old	20	476,422	120,416	20	3,167.93	360.13
GM	C	6-yr old	20	467,187	123,868	20	2,622.38	341.98
GM	MF	New	20	1,430,404	417,731	20	10,253.04	693.66
GM	MF	1-yr old	20	1,524,642	474,710	20	8,384.19	702.81
GM	MF	2-yr old	20	1,628,474	565,020	20	7,044.56	631.31
GM	MF	3-yr old	20	1,681,388	646,236	20	5,815.92	624.39
GM	MF	4-yr old	20	1,736,178	670,403	20	4,723.92	586.27
GM	MF	5-yr old	20	1,778,402	739,394	20	3,838.06	563.05
GM	MF	6-yr old	20	1,805,367	800,813	20	3,112.51	522.13

Table 1: Data: Summary statistics

Imports	New	20	1,096,852	389,527	17	6,838.46	1,024.14
Imports	1-yr old	19	1,080,709	393,267	15	6,585.22	830.80
Imports	2-yr old	18	1,055,002	387,895	15	5,757.51	858.42
Imports	3-yr old	17	998,070	368,379	14	4,954.92	684.54
Imports	4-yr old	16	948,918	348,966	13	4,293.31	558.09
Imports	5-yr old	15	891,956	322,511	12	3,693.99	622.94
Imports	6-yr old	14	831,221	302,786	11	3,176.97	453.42

Table 2: Estimation results: Quality ladder parameters ( $\alpha$ 's)

Manufacturer	Segment	Vintage	Estimate	Std. Error
Chrysler	SC	New	1.293	0.223
Chrysler	SC	1-yr old	0.573	0.149
Chrysler	SC	2-yr old	0.254	0.098
Chrysler	SC	3-yr old	0.113	0.059
Chrysler	SC	4-yr old	0.050	0.033
Chrysler	SC	5-yr old	0.022	0.018
Chrysler	SC	6-yr old	0.010	0.009
Chrysler	C	New	1.320	0.257
Chrysler	C	1-yr old	0.647	0.164
Chrysler	C	2-yr old	0.317	0.114
Chrysler	C	3-yr old	0.156	0.076
Chrysler	C	4-yr old	0.076	0.047
Chrysler	C	5-yr old	0.037	0.028
Chrysler	C	6-yr old	0.018	0.016
Chrysler	MF	New	1.550	0.289
Chrysler	MF	1-yr old	0.868	0.195
Chrysler	MF	2-yr old	0.486	0.144
Chrysler	MF	3-yr old	0.272	0.104
Chrysler	MF	4-yr old	0.152	0.072
Chrysler	MF	5-yr old	0.085	0.049
Chrysler	MF	6-yr old	0.048	0.032
Ford	SC	New	1.731	0.302
Ford	SC	1-yr old	0.927	0.228
Ford	SC	2-yr old	0.497	0.169
Ford	SC	3-yr old	0.266	0.118
Ford	SC	4-yr old	0.143	0.079
Ford	SC	5-yr old	0.076	0.050
Ford	SC	6-yr old	0.041	0.031
Ford	C	New	1.768	0.337
Ford	C	1-yr old	1.047	0.237
Ford	C	2-yr old	0.620	0.179
Ford	C	3-yr old	0.367	0.133

Table 2: Estimation results: Quality ladder parameters ( $\alpha$ 's)

Ford	C	4-yr old	0.218	0.097
Ford	C	5-yr old	0.129	0.068
Ford	C	6-yr old	0.076	0.047
Ford	MF	New	2.076	0.382
Ford	MF	1-yr old	1.403	0.299
Ford	MF	2-yr old	0.949	0.243
Ford	MF	3-yr old	0.641	0.197
Ford	MF	4-yr old	0.434	0.158
Ford	MF	5-yr old	0.293	0.124
Ford	MF	6-yr old	0.198	0.096
GM	SC	New	1.695	0.312
GM	SC	1-yr old	0.768	0.201
GM	SC	2-yr old	0.348	0.133
GM	SC	3-yr old	0.158	0.081
GM	SC	4-yr old	0.072	0.047
GM	SC	5-yr old	0.032	0.026
GM	SC	6-yr old	0.015	0.014
GM	C	New	1.731	0.349
GM	C	1-yr old	0.868	0.213
GM	C	2-yr old	0.435	0.150
GM	C	3-yr old	0.218	0.101
GM	C	4-yr old	0.109	0.064
GM	C	5-yr old	0.055	0.039
GM	C	6-yr old	0.027	0.023
GM	MF	New	2.032	0.396
GM	MF	1-yr old	1.163	0.262
GM	MF	2-yr old	0.665	0.192
GM	MF	3-yr old	0.380	0.141
GM	MF	4-yr old	0.218	0.100
GM	MF	5-yr old	0.124	0.069
GM	MF	6-yr old	0.071	0.046
Import (1971-1978)		New	0.866	0.218
Import (1971-1978)		1-yr old	0.459	0.133

Table 2: Estimation results: Quality ladder parameters ( $\alpha$ 's)

Import (1971-1978)		2-yr old	0.243	0.112
Import (1971-1978)		3-yr old	0.129	0.087
Import (1971-1978)		4-yr old	0.068	0.061
Import (1971-1978)		5-yr old	0.036	0.040
Import (1971-1978)		6-yr old	0.019	0.026
Import (1979-1982)		New	1.006	0.980
Import (1979-1982)		1-yr old	0.533	0.442
Import (1979-1982)		2-yr old	0.282	0.207
Import (1979-1972)		3-yr old	0.150	0.105
Import (1979-1982)		4-yr old	0.079	0.059
Import (1979-1982)		5-yr old	0.042	0.036
Import (1979-1982)		6-yr old	0.022	0.022
Import (1983-1986)		New	0.885	0.410
Import (1983-1986)		1-yr old	0.469	0.162
Import (1983-1986)		2-yr old	0.248	0.090
Import (1983-1986)		3-yr old	0.132	0.066
Import (1983-1986)		4-yr old	0.070	0.048
Import (1983-1986)		5-yr old	0.037	0.033
Import (1983-1986)		6-yr old	0.020	0.022
Import (1987-1990)		New	1.179	0.488
Import (1987-1990)		1-yr old	0.625	0.203
Import (1987-1990)		2-yr old	0.331	0.128
Import (1987-1990)		3-yr old	0.175	0.096
Import (1987-1990)		4-yr old	0.093	0.069
Import (1987-1990)		5-yr old	0.049	0.047
Import (1987-1990)		6-yr old	0.026	0.031

Table 3: Estimation results: Non- quality ladder parameters  
 Marginal Costs (\$'000): specification is  $MC(x) = \beta_0 + 2\beta_1x$

Manufacturer	Segment	Parameter	Estimate	Std. Error
Chrysler	SC	$\beta_1$	1.956	16.198
Chrysler	SC	$\beta_2$	13.206	56.502
Chrysler	C	$\beta_1$	3.315	8.359
Chrysler	C	$\beta_2$	4.192	11.234
Chrysler	MF	$\beta_1$	4.522	13.948
Chrysler	MF	$\beta_2$	12.286	44.353
Ford	SC	$\beta_1$	2.780	14.028
Ford	SC	$\beta_2$	9.468	21.007
Ford	C	$\beta_1$	3.293	22.293
Ford	C	$\beta_2$	11.588	32.309
Ford	MF	$\beta_1$	5.849	37.141
Ford	MF	$\beta_2$	6.470	30.667
GM	SC	$\beta_1$	0.924	7.990
GM	SC	$\beta_2$	8.799	14.891
GM	C	$\beta_1$	1.505	12.695
GM	C	$\beta_2$	7.440	13.240
GM	MF	$\beta_1$	4.444	18.312
GM	MF	$\beta_2$	2.760	7.785
# moment restrictions	395 <sup>a</sup>			

<sup>a</sup>We used 5 demand instruments for each of the demand residuals corresponding to 70 model-years, and 5 supply instruments for each of the supply function residuals corresponding to the 9 composite new car models.