

The determinants of used car prices in New Zealand

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Data



TradeMe used car listings (May 2018 – May 2019):

- ▶ 549,000 classified listings
- ▶ 106,000 auction listings (39,000 sold)

Cars matched to:

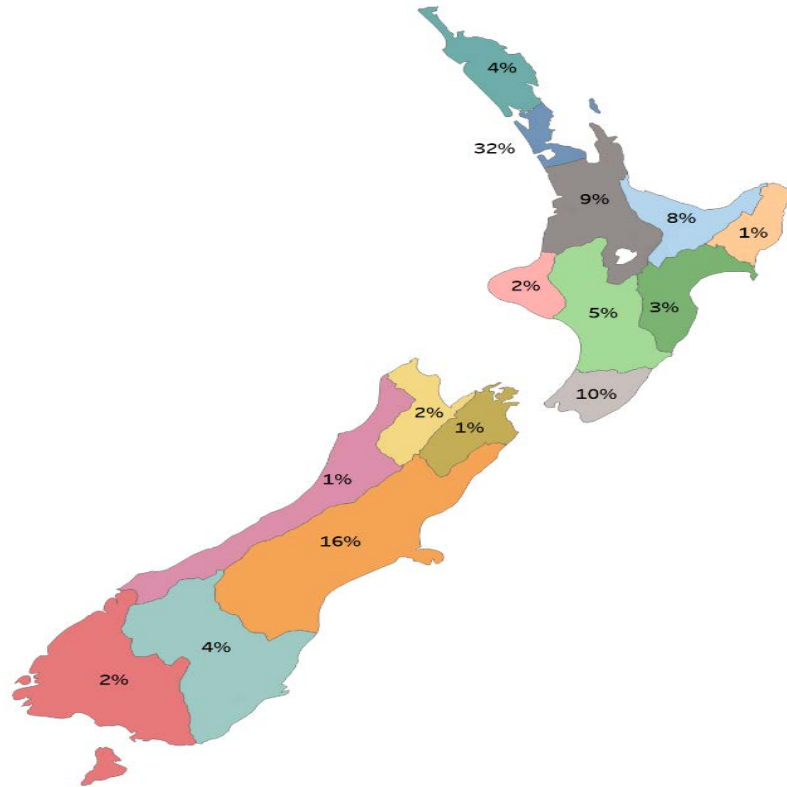
- ▶ RightCar Vehicle Information Database
- ▶ Motor Vehicle Register



Descriptive statistics



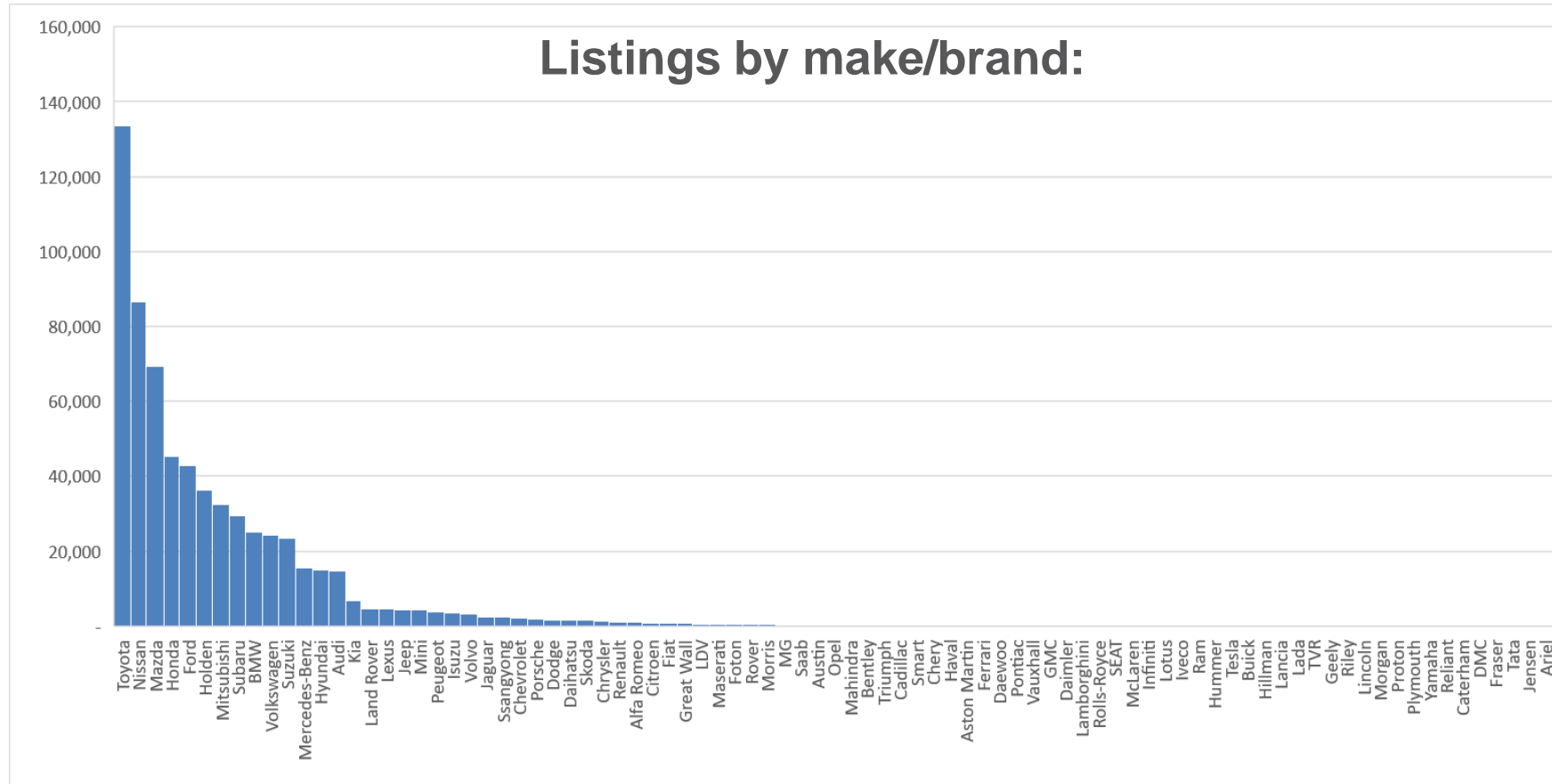
Auction sales volume:



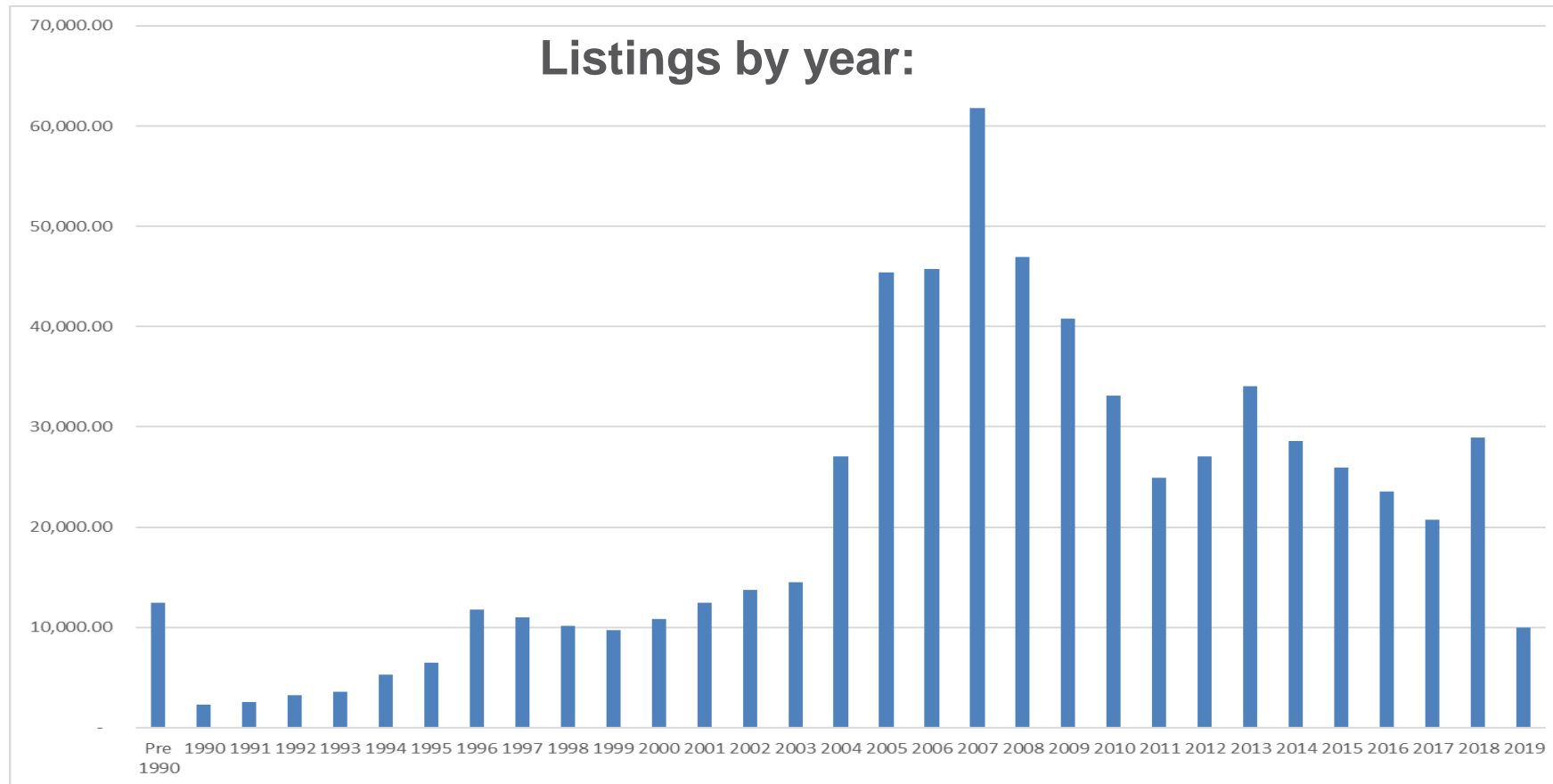
Average auction sold price:



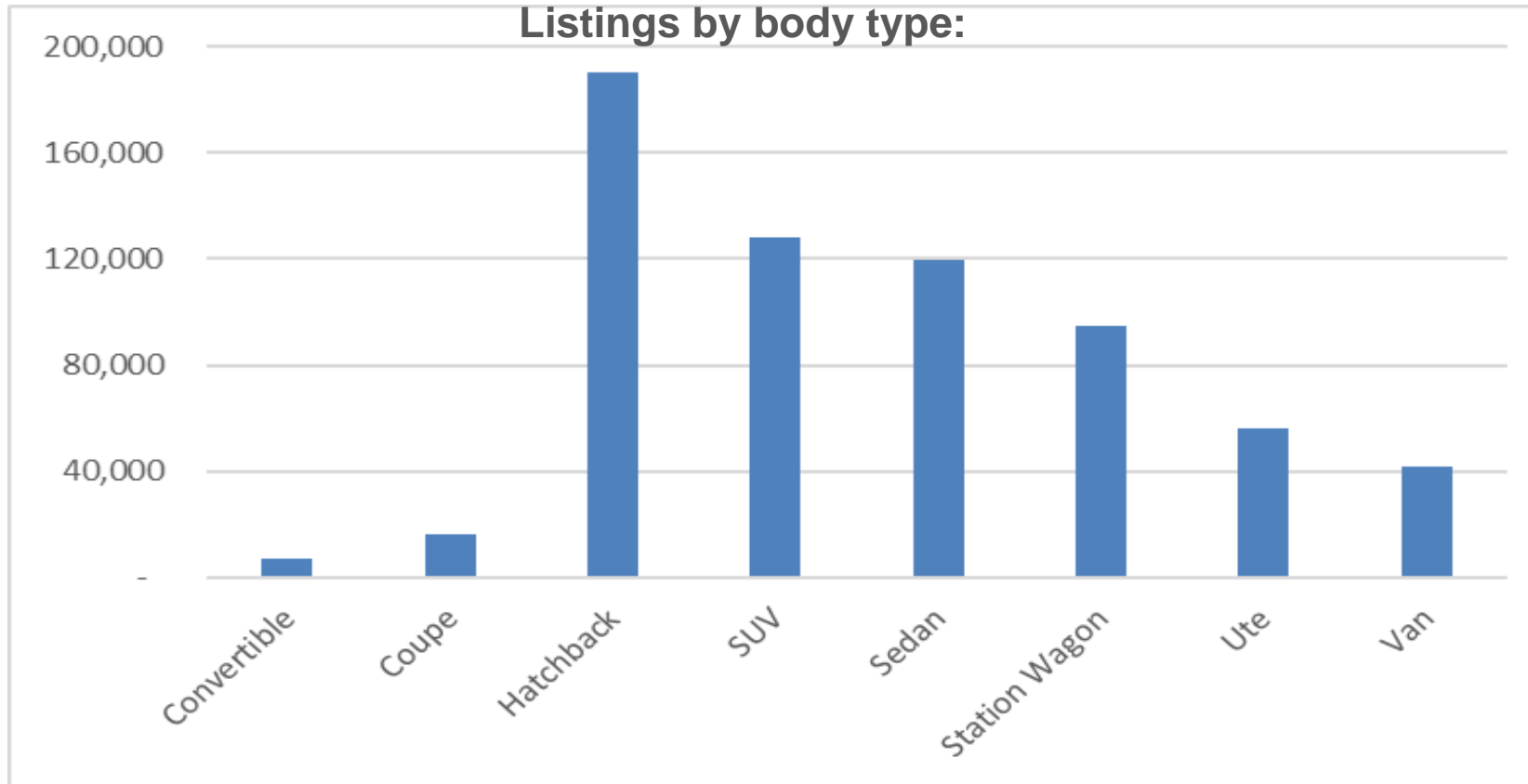
Descriptive statistics (cont)



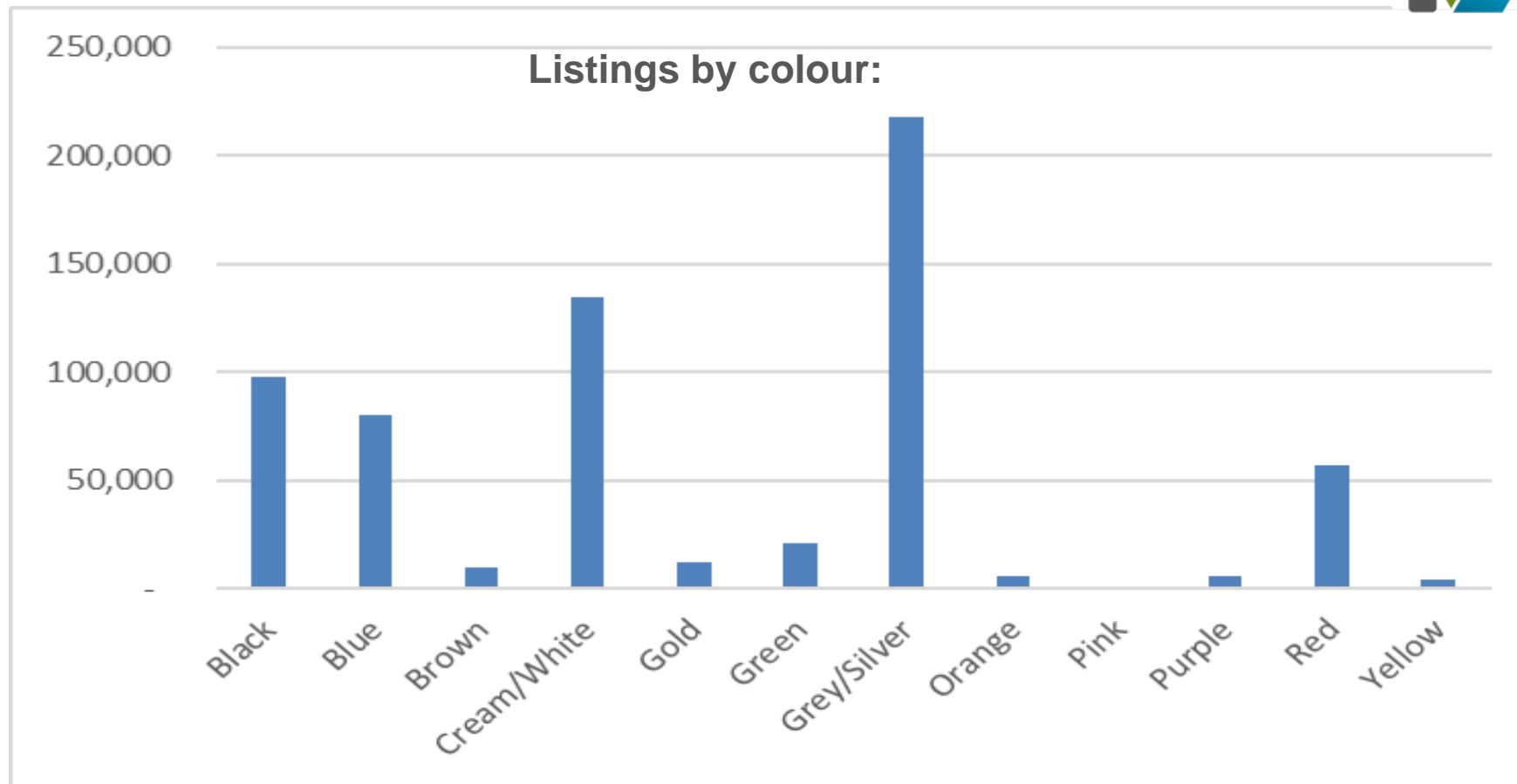
Descriptive statistics (cont)



Descriptive statistics (cont)



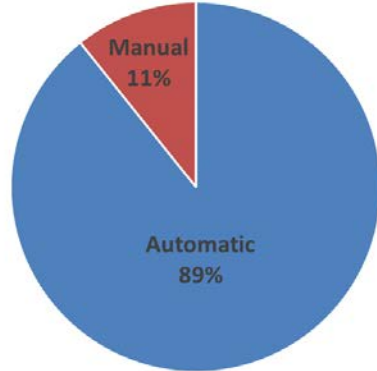
Descriptive statistics (cont)



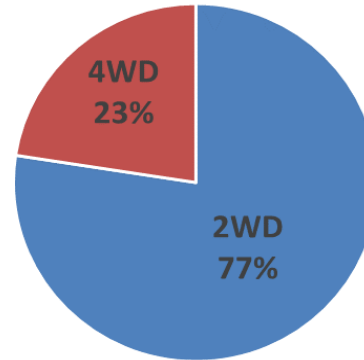
Descriptive statistics (cont)



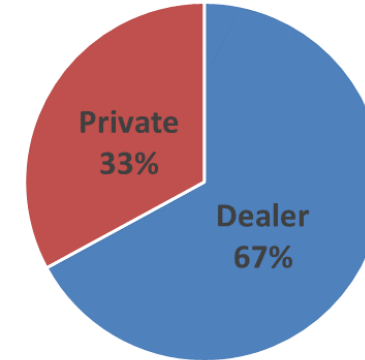
Transmission:



Drive:



Seller:



Method



Multiple Regression – Ordinary Least Squares (OLS)

- ▶ Dummy, categorical, and continuous variables.
- ▶ No transformations (aside from mean centering some continuous variables).

Limitations – to name a few!

- ▶ Linear explanatory variables
- ▶ Endogeneity
- ▶ Collinearity and multicollinearity



Auction model



Sold price ~

- ▶ Intercept
- ▶ Buyer's gender (vs female)
- ▶ Buyer's region (vs South Island)
- ▶ Buyer's age (vs 40-65)
- ▶ Seller (vs Dealer)
- ▶ Vehicle age (years)
- ▶ Mileage (1,000km)
- ▶ Engine size (litres – mean centered)
- ▶ Emissions (CO₂ g/km – mean centered)
- ▶ Drive (vs 4WD)
- ▶ Transmission (vs Manual)
- ▶ Colour (vs Grey/Silver)
- ▶ Country of make/brand (vs Japan)
- ▶ Body type (vs Hatchback)
- ▶ Fuel type (vs Petrol)
- ▶ Used car safety rating (vs 5 stars)



Auction model results



n = 12,366

Adjusted R-squared = 0.67

Intercept	\$20,386	(0.00)	Engine size	\$2,422	(0.00)
Male buyer	-\$34	(0.67)	Emissions	-\$10	(0.00)
North Island buyer	-\$335	(0.00)	Two wheel drive	-\$1,733	(0.00)
18-24 y/o buyer	\$106	(0.42)	Automatic	-\$258	(0.00)
25-39 y/o buyer	\$85	(0.72)	Diesel	\$3,475	(0.00)
65+ y/o buyer	-\$401	(0.02)	1 Safety star	\$74	(0.68)
Private seller	\$525	(0.00)	2 Safety stars	-\$1,473	(0.00)
Vehicle age	-\$626	(0.00)	3 Safety stars	-\$1,564	(0.00)
Mileage	-\$27	(0.00)	4 Safety stars	-\$1,917	(0.00)



Auction model results (cont)



Green	\$433	(0.02)	French	-\$2,146	(0.00)
Cream/White	\$533	(0.00)	Australian	-\$2,002	(0.00)
Gold	-\$608	(0.00)	German	-\$998	(0.00)
Purple	-\$1,081	(0.02)	South Korean	-\$1,875	(0.00)
Orange	\$1,465	(0.01)	American	-\$1,670	(0.00)
Convertible	\$3,177	(0.00)	British	\$780	(0.07)
SUV	\$1,663	(0.00)	Chinese	-\$7,913	(0.00)
Coupe	\$871	(0.02)	Indian	-\$7,715	(0.05)
Ute	\$5,614	(0.00)	Italian	-\$611	(0.49)
Van	\$3,359	(0.00)	Czech	\$2.9	(0.99)
Station wagon	\$3,475	(0.00)	Swedish	\$1,821	(0.20)



Classified model differences



n = 236,795

Adjusted R-squared = 0.77

Intercept	\$34,157	(0.00)	German	\$4,095	(0.00)
Private seller	-\$33	(0.36)	French	-\$104	(0.58)
Red	\$459	(0.00)	Czech	\$2,526	(0.00)
Blue	\$264	(0.00)	British	\$19,535	(0.00)
Yellow	\$1,064	(0.00)	Italian	\$8,658	(0.00)
Electric vehicle	\$32,134	(0.00)	Indian	-\$16,317	(0.00)
1 Safety star	\$4,671	(0.00)	Swedish	\$3,338	(0.01)
2 Safety stars	\$1,677	(0.00)	Sedan	\$328	(0.00)



Thank you

