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Graduation: May 2025

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REGRESSION: A DEEP DIVE INTO TRUCK PRICES

Abstract

This regression analysis examines variables affecting used truck pricing and offers insight into the automotive demand factors. This study dives into the process of determining the prices of Ford F150 Supercabs and comparable Chevrolet Silverados. The primary objective is to develop a model that looks at the pricing dynamics, considering factors such as age, mileage, accidents, and brand.

Introduction

My decision to run a regression on truck prices stems from my experience of working in the accounting office of a busy car dealership. With this exposure, I find myself curious about how our inventory is priced. I decided to look at prices of Ford F150 's and similar Chevrolet Silverados to generate a model for used truck prices. I pulled the data for from Carvana.com.

Red Ford F 150 Raptor Pickup Car With Sunset Sky Background 4K 8K HD Ford Raptor Wallpapers | HD Wallpapers | ID #59815
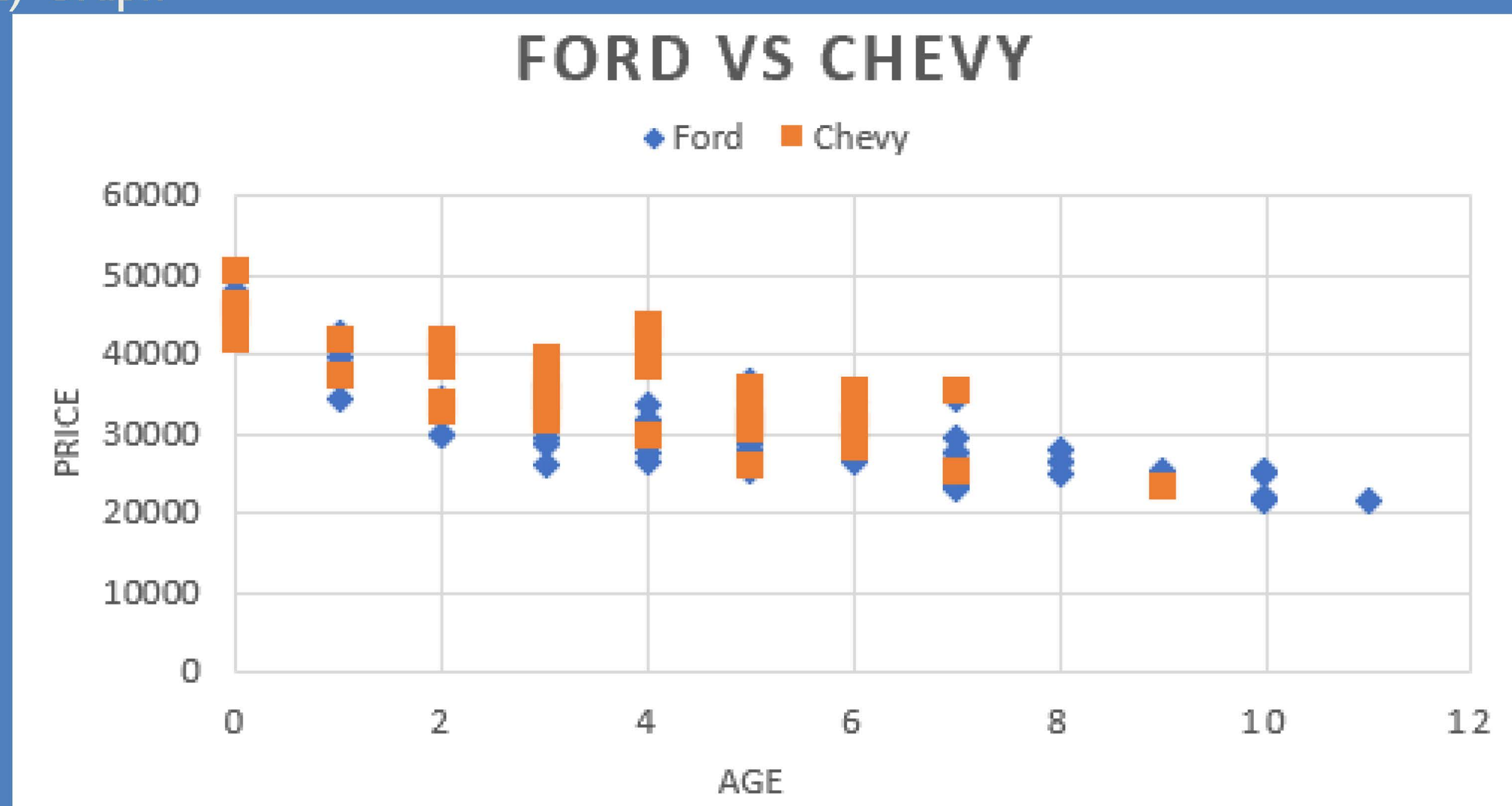

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Tables

(1) Summary statistics table

	Price	Year	Mileage	Accident	Imperfections	Ford
Mean	$32,534.23	2,018.60	46,722.37	0.077	3.21	0.63
Std Dev	$ 6,494.18	2.68	26,637.25	0.268	1.73	0.49
Min	$21,590.00	2,012	31.00	0	0	0
Max	$50,590.00	2,023	102,616.00	1	11	1
Count	104	104	104	104	104	104

(2) Graph

(3) Correlation Matrix

	Price	Age	Mileage	Accidents(1=Yes)	Imperfections	Ford (1=Yes, 0=Chevy)
Price	1					
Age	-0.800	1				
Mileage	-0.645	-0.471	1			
Accidents(1=Yes)	-0.011	-0.119	0.046	1		
Imperfections	-0.256	-0.328	0.253	0.132	1	
Ford (1=Yes, 0=Chevy)	-0.425	-0.244	-0.041	-0.149	-0.066	1

Analysis

- Model 1 adjusted R squared: .81179
- Model 2 adjusted R squared: .81369
- Model 3 adjusted R squared: .81490

- Model 3 was the best in explaining the variation in prices. 81.49% of the variation in prices was explained by age, mileage, and Ford.

- Testing for multicollinearity: The correlation between accidents and number of imperfections was .1324

- I learned that less is more. This, model got stronger when accidents and imperfections were taken out and there were only 3 variables used in the final strongest model.

- I learned that Chevy Silverados tended to be priced, on average, $4,115.34 higher than Ford F150's

	Model 1		Model 2		Model 3	
Age	-1299.953	***	-1300.740	***	-1288.761	***
	(129.253)		(124.157)		(122.090)	
Mileage	-0.099	***	-0.099	***	-0.099	***
	(0.012)		(0.012)		(0.012)	
Accidents(1=Yes)	627.052		625.134		x	
	(1066.800)		(1058.250)			
Imperfections	-4.053		x		x	
	(173.552)					
Ford (1=Yes, 0+Chevy)	-4093.829	***	-4092.034	***	-4160.161	***
	(614.422)		(606.511)		(593.504)	
Adjusted R Square	0.81179		0.81369		0.81490	
Observations	104		104		104	

Conclusion

In summary, the simplest model with the least variables ended up being the strongest. Mileage, age, and ford were the only 3 significant variables. Accidents and the number of imperfections were insignificant. This was surprising because whether a car was in an accident or not should impact price however, this model said otherwise. This abnormality was not a result of multicollinearity.