Marketing Mix

Vodka Industry

First Regression

	Coefficient	*p-value*
Intercept	0.8605	<0.01
LogLastYearSales	**0.9221**	**<0.01**
LogPrice	-0.0851	<0.01
LogOutdoorAdvExp	**-0.0072**	**0.18**
LogBroadcastingAdvExp	**0.0100**	**0.06**
LogPrintAdvExp	0.0241	<0.01
Adj R-Sq	98%	

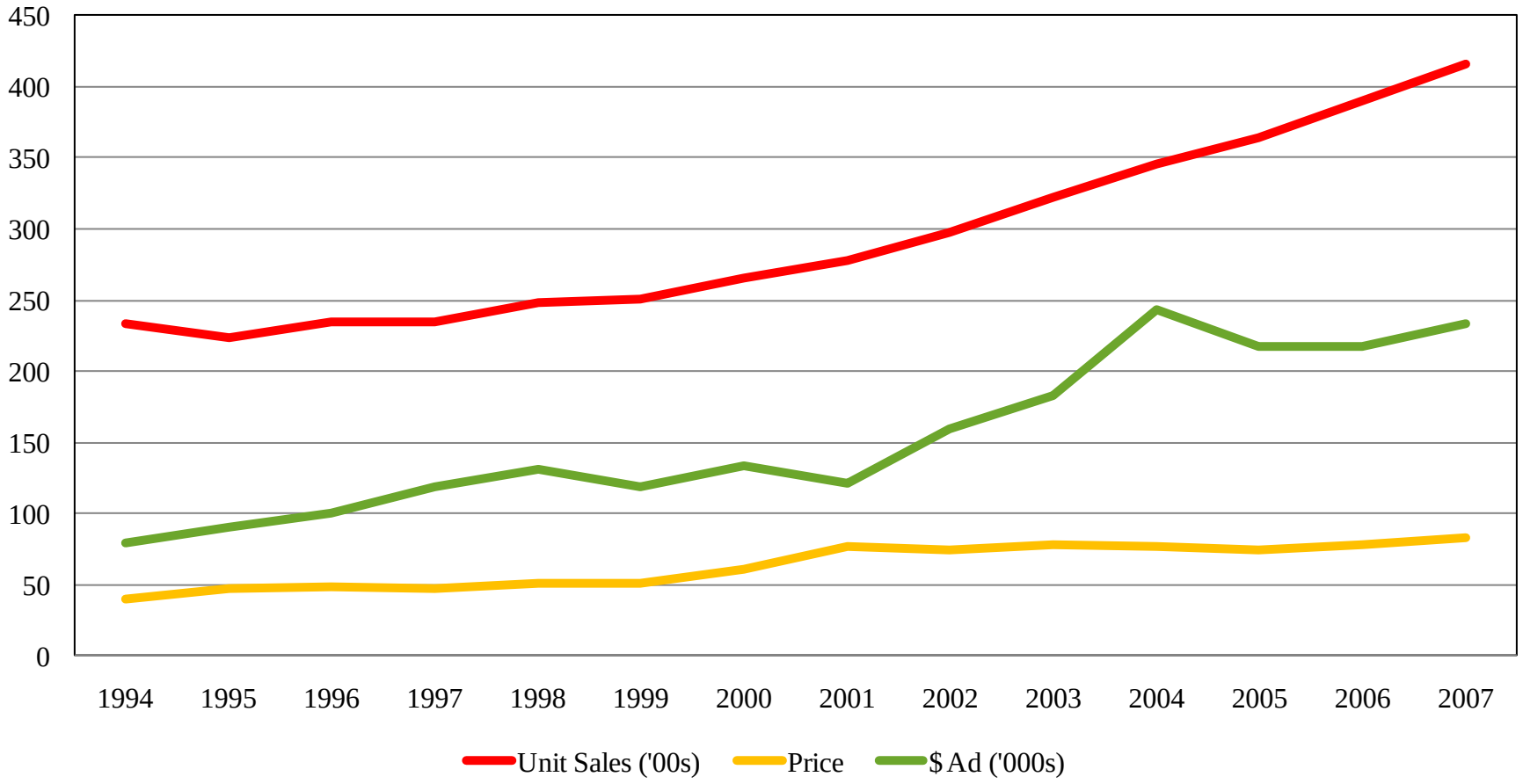
	Coefficient	*p-value*
Intercept	0.411641725	<0.01
LogLastYearSales	**0.947751199**	**<0.01**
LogPrice		
LogOutdoorAdvExp		
LogBroadcastingAdvExp		
LogPrintAdvExp		
Adj R-Sq	97.7%	

Unit Roots

- Common in data that:
  - spans long time periods
  - is aggregated across units (customers, stores etc)

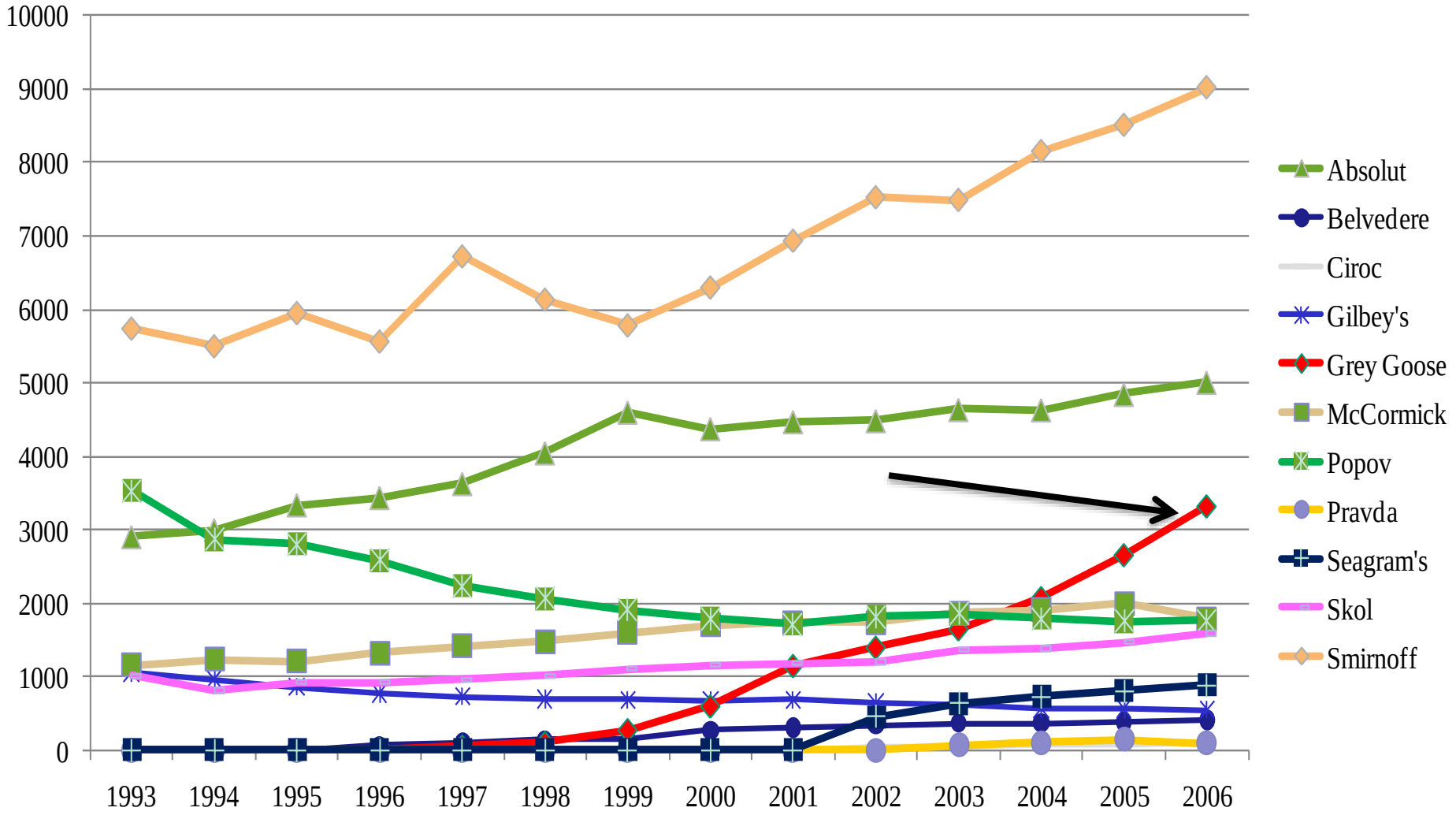
- Y (t) = b0 + Y(t-1) + error
  - Sales in time t is equal to sales last year plus error
  - Random noise or error is the only thing that determines how sales progresses over years.
  - What is the managerial relevance?

Effect of Marketing Mix - Industry

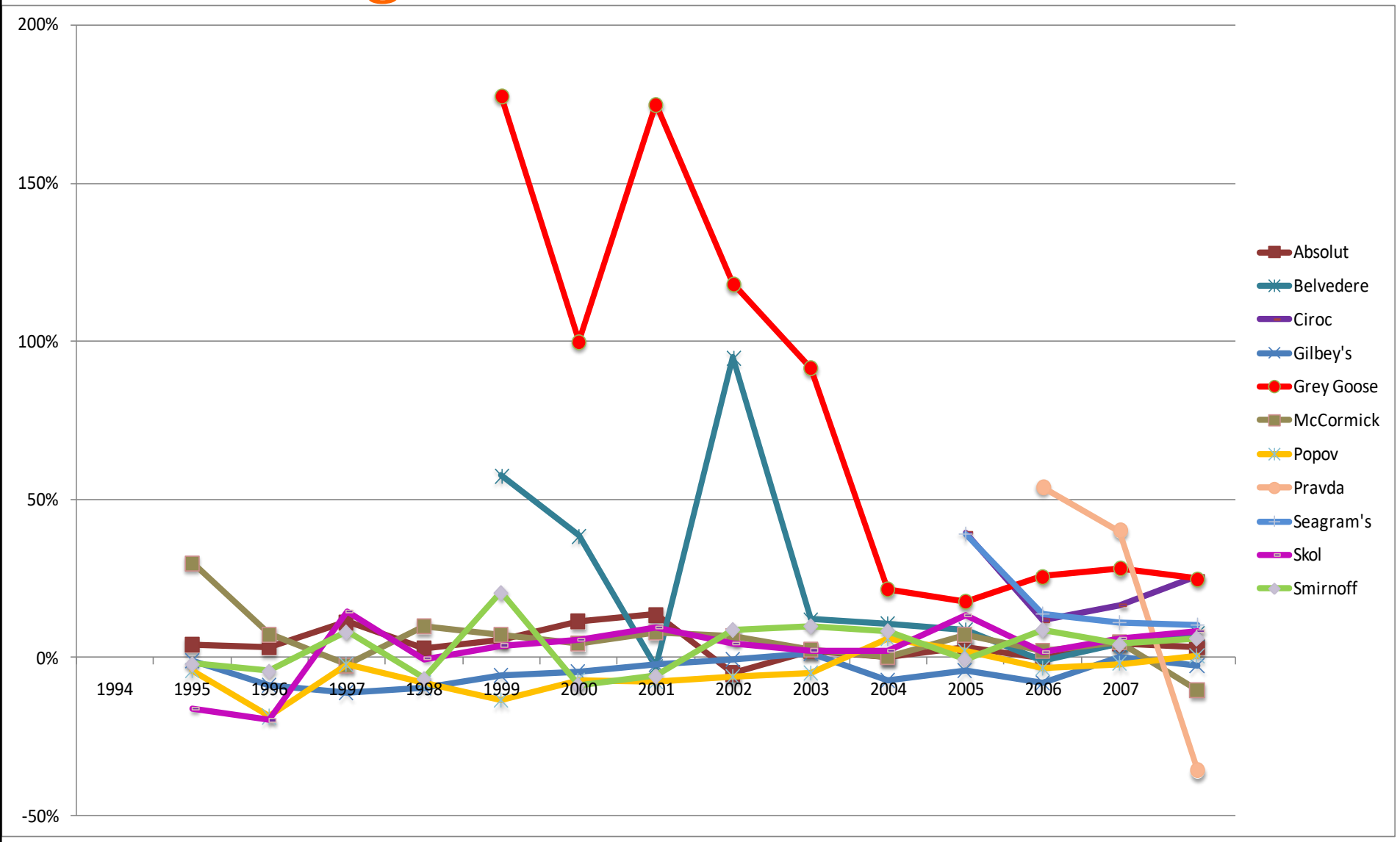


Does sales increase with a price increase?

Except Grey Goose No Brand Changes Tier



Change in Sales is More Relevant



Marketing Mix Models - Comparison

		Advertising			
Regression Characteristic	Price	Print	Broadcast	Outdoor	Adj. R2
Unit Sales	**-0.085**	**0.024**	**0.010**	-0.007	98%
Change in Sales	-0.002	**0.018**	-0.004	**-0.011**	9%
Add Brand Tier	**-0.038**	**0.009**	-0.005	**-0.013**	11%
Add Competition and market share	**-0.060**	**0.014**	-0.001	-0.007	16%
Add New Product Intro	**-0.089**	**0.015**	0.003	**-0.008**	30%

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Short Changed

Why do tall people make more money?

235 22 0

By Steven E. Landsburg

Economists have known for a long time that it pays to be tall. Multiple studies have found that an extra inch of height can be worth an extra $1,000 a year or so in wages, after controlling for education and experience. If you're 6 feet tall, you probably earn about $6,000 more than the equally qualified 5-foot-6-inch shrimp down the hall. (Previously in this column, I wrote about the connection between **beauty and income** and **weight and income**.)

Earnings = f(height)

Regression Statistics	
R-Sq	0.09
Observations	1192

	Coefficients	P-value
Intercept	-61,316	<.01
Height	1262	<.01

Earnings = f(height, Male)

Regression Statistics	
R-Sq	.09
Observations	1192

	Coefficients	P-value
Intercept	-10,334	.98
Height	443	.02
Male	9088	<.01

Marketing Mix Models – Compare Coefficients

		Advertising			
Regression Characteristic	Price	Print	Broadcast	Outdoor	Adj. R2
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Include Brand Equity

- Create dummy variable that equals 1 if the row in the data corresponds to a brand, and 0 otherwise.

- The coefficient of the dummy variable captures brand equity.

Equity of Vodka Brands

Absolut	**0.262**	Kamchatka	**-0.225**
Aristocrat	**-0.194**	Ketel One	0.148
Barton	**-0.182**	Level	0.599
Belvedere	0.132	McCormick	**-0.184**
Burnett	-0.081	Polar Ice	-0.066
Chopin	0.083	Popov	**-0.244**
Crystal Palac	**-0.186**	Pravda	-0.094
Finlandia	-0.014	Skol	**-0.164**
Fleischmann's	-0.173	Sky	**0.126**
Fris	0.041	Stolicnaya	0.062
Gilbey's	**-0.235**	Tanqueray	-0.060
Gordon's	**-0.189**	Three Olives	**0.523**
Grey Goose	**0.598**	Smirnoff	0.000

Adj R-Sq = 50%: **Smirnoff is the Base Brand**

Marketing Mix Models - Summary

- High R-Squares can be misleading
- Change in sales better than level of sales
- Evaluate relationships among the independent variables
- Competition, new entrants, brand equity have an influence on a brand's price and advertising elasticity

Marketing Mix Models - Summary

- Are independent variables correlated?
  - Is the sign of a variable not making sense?
  - Is the significance and sign of the coefficient changing with other variables in the model?
- Do we have an omitted variable bias?
- If no omitted variable bias-
  - Check for correlation among independent variables
  - If they are correlated; try combining them (add/subtract/divide/multiply etc.)