Vertical Integration/ Agency Costs in Gasoline Distribution

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Refiners' Sales of Gasoline Through Various Distribution Channels
2000

Vertically Integrated Outlets	Direct Distribution (Dealers)	Indirect Distribution (Jobbers)	Bulk Sales
16%	17%	56%	11%

Source: DOE/EIA.

Sales of Gasoline Through Refiners' Vertically Integrated Outlets, by Year
1994-2000

1994	18.1%
1995	16.1%
1996	16.7%
1997	18.9%
1998	17.8%
1999	16.3%
2000	15.9%

Simple Model of Asymmetric Retail Price Response to Changes in DTW Prices

$$?R = \alpha + ß_1 * \ ?DTW + ß_2*(UP*?DTW) + ß3 * STK$$

Asymmetry in price response = $ß_2$

The Period Prior to the Khan Decision

Regression Results – Simple Model of Asymmetry
In the Period Before the Khan Decision: 1994-1997

Variable	**Coefficient**	**Standard Error**	**t-Statistic**
Constant	-.604	.136	-4.43
?DTW	.594	.037	15.99
?DTW*UP	.434	.057	7.62
STK	.104	.117	0.88
Adjusted R2 = .81			
Durbin-Watson= 1.99			

1 cent increase in DTW: 1.0 cent increase at retail

1 cent decrease in DTW: .06 cent decrease at retail

Asymmetry in retail price response: 0.4 cent

The Period After the Khan Decision

Regression Results – Simple Model of Asymmetry
In the Period After the Khan Decision: 1998-2001

Variable	Coefficient	Standard Error	t-Statistic
Constant	-.308	.149	-2.07
?DTW	.915	.037	27.26
?DTW*UP	.104	.045	2.33
STK	.181	.120	1.51
?(1)	-.461	.054	-8.56
?(2)	-.388	.051	-7.61

Adjusted R2 = .90
Durbin-Watson= 2.3

1 cent increase in DTW: 1.0 cent increase at retail

1 cent decrease in DTW: 0.9 cent decrease at retail

Asymmetry in retail price response: 0.1 cent

Model of Asymmetry and Vertical Integration

$$?R = ß * ?DTW + ß_2*UP* ?DTW + ß_3 ?DTW*VI + ß_4 ?DTW* VI * UP + ß_5*STK$$

Asymmetry is dependent on the level of vertical integration:

$$ß_2 + ß_4*VI$$

Model Including Vertical Integration

Regression Results – Model Including Vertical Integration
Before the Khan Decision: 1994-1997

Variable	Coefficient	Standard Error	t-Statistic
Constant	-.560	.136	-4.13
?DTW	.516	.068	7.60
?DTW*UP	.642	.089	7.22
?DTW*VI	.455	.306	1.49
?DTW*VI*UP	-1.241	.391	-3.18
STK	.070	.117	0.60

Adjusted R-Squared = .82
Durbin-Watson Statistic = 2.0

Summary of Results for Model Including Vertical Integration

For Markets with VI = 0:
1 cent increase in DTW: 1.1 cent increase at retail
1 cent decrease in DTW: 0.5 cent decrease at retail
Asymmetry in retail price response is .6 cent

For Markets with VI = .46
1 cent increase in DTW: 0.8 cent increase at retail
1 cent decrease in DTW:0.7cent decrease at retail
Asymmetry in retail price response is .1 cent