

Split Price Indices in Gulf's Residential Model

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Overview

- Gulf's residential usage model had larger residuals during 2011 to 2012 historical period
 - Lower electricity prices
 - Improving economic conditions
 - Declining, not increasing, use per customer
- Review of model results indicated price declines were expected to result in higher usage
- Thought was price increases result in usage declines but price decreases do not lead to higher usage
- Began search for any research into asymmetrical price elasticity

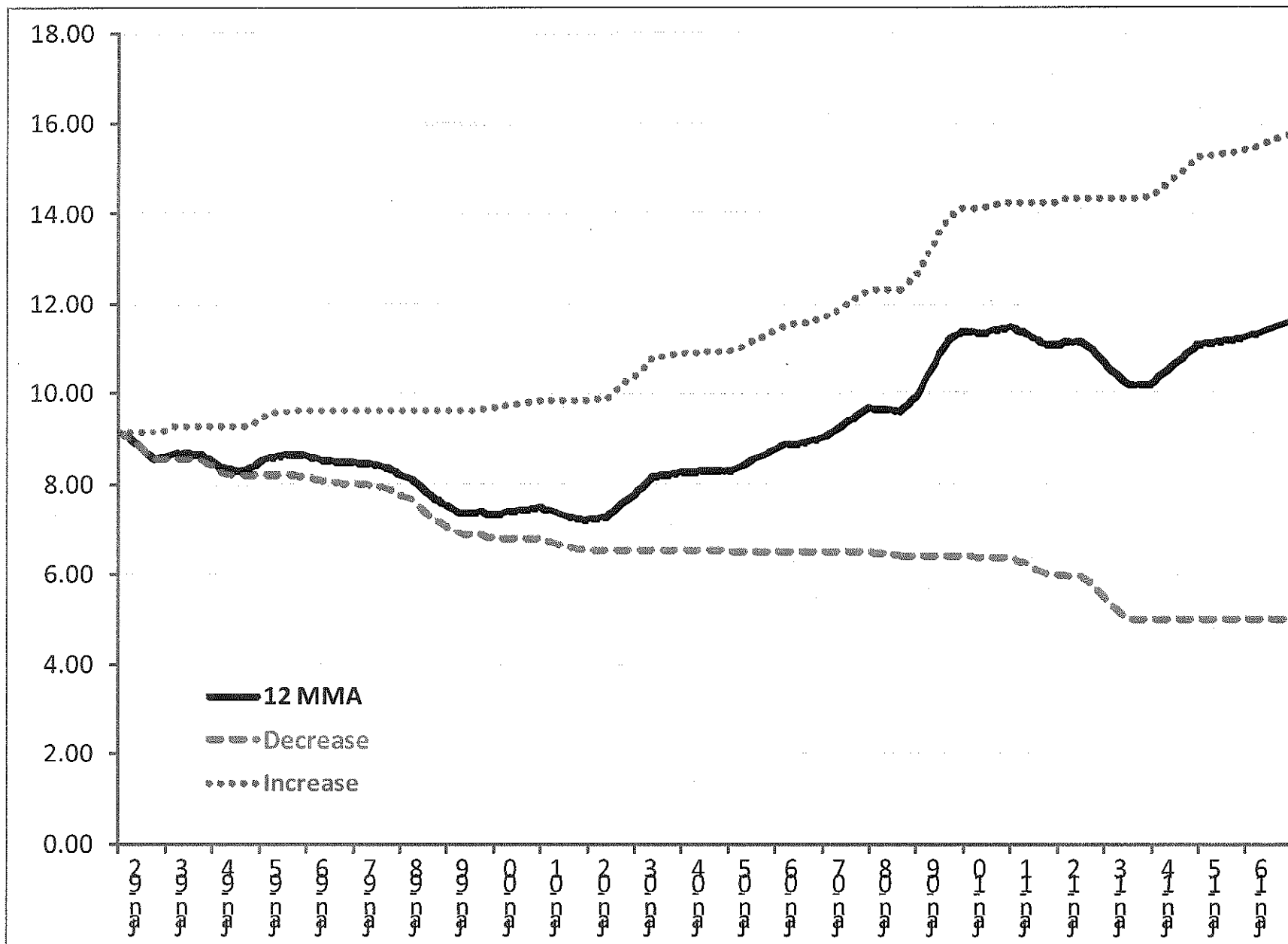
Overview Continued

- Discovered limited available research regarding price elasticity
 - No research specific to electricity
 - Limited research related to gasoline or oil
- Began experimenting with different price specifications to capture asymmetrical elasticity
 - Simplicity
 - Expect greater elasticity for price increase than for price decrease
 - Elasticity for single price variable should be between the elasticities for price increases and decreases

Price Calculation

- Begin with 12-month moving average real prices
- Create 2 separate price streams
 - Declining index
 - Increasing index
- Both price indices are the same at t_0
- For t_1 , calculate difference in price from t_0 to t_1
 - If negative, apply delta to declining index and keep increasing index unchanged
 - If positive, apply delta to increasing index and keep declining index unchanged
- Results are 2 price indices, 1 flat or declining and 1 flat or increasing

Resulting Price Indices



Model/Variables Statistics

	Single Price	Split Prices
Adjusted R ²	98.45%	98.47%
Skewness	0.166	0.178
Kurtosis	3.601	3.762
MAPE	2.10%	2.07%

	Single Price	Declining Price	Increasing Price
t-stat	-10.672	-1.739	-9.997
p-value	0.00%	8.36%	0.00%
Elasticity	-0.306	-0.124	-0.426

Application

- This method was used in Gulf's 2013 rate case (Docket No. 130140-EI)
- Several discovery requests from FPSC staff related to split prices
 - Questions regarding asymmetrical price elasticity
 - Statistical validity
 - Any research related to asymmetrical price elasticity
- Rate case settlement agreed to by all parties and approved by Commission
 - No changes to load forecast