

# Retailer Response to Price Gouging Litigation and Consumer Food Prices

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## Abstract

The COVID-19 pandemic fundamentally changed how consumers obtained food with a dramatic shift out of food service and restaurants into grocery retail. At the onset of the pandemic, prices of a variety of goods, including groceries, increased rapidly. In many cases, U.S. states filed lawsuits alleging price gouging behavior of food retailers and producers. In this paper, we examine the case of eggs and find that price gouging litigations lead to a dramatic change in retailer behavior, long after the resolution of many of these disputes. We find that retailers responded by rigidly adhering to pre-pandemic price levels for eggs, despite that fact that costs of production of eggs increased sharply during this time. We determine a breakdown in the pre-pandemic relationship between input costs and output prices for eggs. Additionally, we find that retailers significantly decreased their purchases of eggs and reduced the number of advertisements they placed for eggs, suggesting they are now willing to accept empty shelves in lieu of increasing prices.

*Keywords:* Price gouging, COVID-19, food retailing, eggs

*JEL Codes:* Q11, K2

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# 1 Introduction

The onset of the COVID-19 pandemic drastically altered food consumption behavior and shifted consumption away from restaurants and food service in favor of grocery retail. Alongside increased grocery retail demand increases, retail prices have spiked for some staple food products. Consequently, consumer groups and state attorneys general filed a flurry of lawsuits alleging food retailers (Albertson’s, Costco, H.E.B, Kroger, Trader Joe’s, Walmart) and distributors engaged in anti-competitive behavior in the form of price gouging (Progressive Grocer, 2020). Price gouging protections are not present in all states, and those states that do have them differ in how they specify these consumer protections (Morton, 2021). Generally, price gouging laws activate only during a state of emergency and prohibit producers and retailers of essential goods from increasing prices above some threshold, relative to prices before the declaration of emergency.

Price gouging laws are designed to protect consumers from skyrocketing prices, but are they beneficial to food consumers in practice? In this research, we analyze this question by studying the responses of food retailers to price gouging litigation in the case of eggs. The increase in grocery demand for eggs, a storable animal protein, led to sharp price increases; 200-300% price jumps over the course of just a few weeks, despite declarations of states of emergency, which activated price gouging protections. Several states have filed price gouging lawsuits against egg producers (Sexton and Sumner, 2020), and although the majority of the suits have been dismissed or settled (Ondeck et al., 2021), retailers have ongoing concerns about pricing strategies.

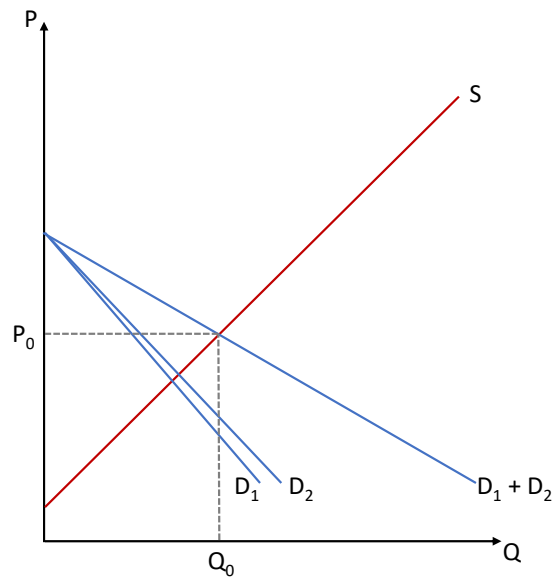
# 2 Background

Price gouging protections generally activate following a declaration of state of emergency by a state governor (Morton, 2021). Most states then place price limitations on certain goods whereby prices are prohibited from increasing relative to a benchmark price measured as the



39 To illustrate the product divergence concern, Figure 2 represents a market in equilibrium  
 40 before an emergency which would cause a demand shock. In this scenario, there are two  
 41 regions demanding this product, represented by  $D_1$  and  $D_2$ . The total market demand of  
 42 these two regions together is  $D_1 + D_2$ . The equilibrium is reached where total demand meets  
 43 supply,  $S$ . In this case, a quantity  $Q_0$  is traded at a price  $P_0$ .

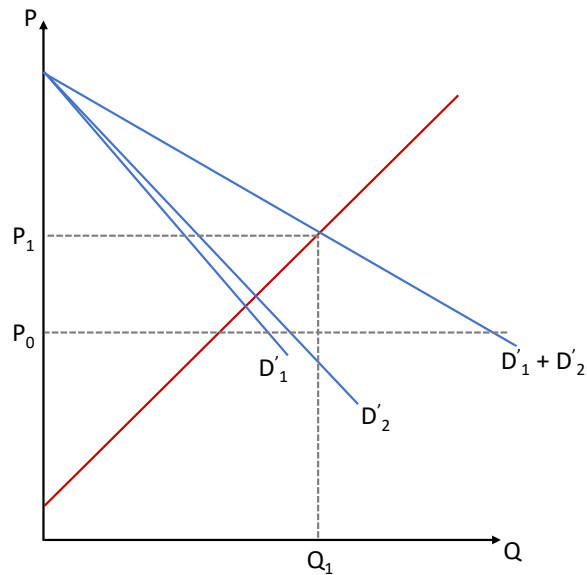
Figure 2: Market Equilibrium before Shock



44 In Figure 3, we introduce a shock to the market that dramatically drives up demand in  
 45 both regions. Supply is unaffected by the shock and we assume no price gouging protections  
 46 are activated. In this case, the quantity consumed increases to  $Q_1$  and the price increases  
 47 from  $P_0$  to  $P_1$ .

48 In Figure 4, we allow for price gouging protections to be activated in region 2. The  
 49 consequence of that is that no transactions may take place in region 2 above the reference  
 50 price which is  $P_0$ , the equilibrium price before the shock. This alters the demand from region  
 51 2 to be zero for all prices above  $P_0$  and to be their full demand curve at prices  $P_0$  and below.  
 52 This results in a kinked demand curve represented by  $D_2''$ . The resulting market demand also  
 53 has a kinked shape where the market demand is simply equal to  $D_1$  for prices above  $P_0$  and  
 54 is equal to the sum of both demands at  $P_0$  and below. In this example (albeit an exaggerated

Figure 3: Market Equilibrium after Shock

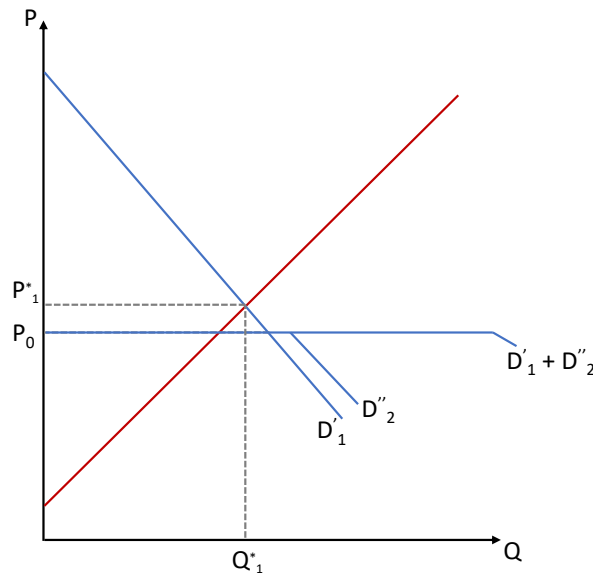


55 case), the new equilibrium after price protections are introduced is the quantity  $Q_1^*$  trading  
 56 at a price  $P_1^*$ . This quantity is sold entirely to region 1 and region 2 is left without any  
 57 product despite a demand in excess of the equilibrium price. While this theoretical example  
 58 is an extreme case, it does illustrate shortcomings of price gouging laws, particularly during  
 59 emergency conditions which span the boundaries of regions with and without price gouging  
 60 protections.

### 61 3 Covid-19 Price Gouging Claims

62 The onset of the COVID-19 pandemic led to an upheaval of how Americans live their lives  
 63 and spend their time. Closure of bars and restaurants led to a fundamental change in  
 64 how Americans accessed food. Up to the start of the pandemic, expenditure on food away  
 65 from home was rapidly growing and even outpaced expenditures on food at home (Ellison  
 66 et al., 2021). However, after the closure of the food service industry and the imposition of  
 67 stay-at-home orders, American spending at grocery stores and online food delivery increased  
 68 dramatically (Grashuis, Skevas and Segovia, 2020). While some products experienced supply

Figure 4: Market Equilibrium after Shock with Price Gouging Protections in Place



69 chain disruptions and panic buying (e.g. toilet paper and cleaning supplies), other goods  
 70 suffered no disruptions (Kirk and Rifkin, 2020). The price of eggs increased sharply from  
 71 less than 50¢ per dozen in January 2020 to over \$1.50 per dozen in March 2020. Numerous  
 72 attorneys general filed price gouging lawsuits against food retailers and egg producers and  
 73 cited the 300% increase in egg price as evidence of price gouging behavior.

74 Price gouging lawsuits alleging the unfair pricing of eggs were filed in California, Min-  
 75 nesota, Texas, New York, and West Virginia. Other products were also alleged to have  
 76 been the subject of price gouging, including gasoline, cleaning products, hand sanitizer, N95  
 77 masks, and paper products. The egg price gouging lawsuits eventually narrowed their focus  
 78 to egg producers and released food retailers from scrutiny.

79 Egg price gouging lawsuits in California, Minnesota, and New York have settled resulting  
 80 in defendant egg producers donating large quantities of eggs or sums of money to food banks  
 81 (Ahumada, 2022; Ellison, 2021; James, 2021). The case in Texas was dismissed (Graber,  
 82 2020).

83 This paper explores the impacts of price gouging allegations after the fact. We examine  
 84 the case of eggs and find that price gouging litigations lead to a dramatic change in retailer

85 behavior, long after the resolution of many of these disputes. We find that retailers responded  
 86 by rigidly adhering to pre-pandemic price levels for eggs, despite that fact that costs of  
 87 production of eggs increased sharply during this time. The price of feed (mainly soybeans and  
 88 corn) is the primary driver of the cost of production of shell eggs. Figure 5 presents the price  
 89 histories of corn, soybeans, and shell eggs from January 2015 to September 2021. Egg prices  
 90 spiked in March 2020 to over \$1.50/dozen but then quickly returned to pre-pandemic levels  
 91 throughout there rest of the time horizon. This return to pre-pandemic price levels is curious  
 92 because the costs of feed inputs, corn and soybeans, were dramatically climbing at this time.  
 93 The price of soybeans increased from \$8.50/bushel in March 2020 to \$14.50/bushel in June  
 94 2021. Over this same time period, corn prices jumped from \$3.68/bushel to \$6.00/bushel.  
 95 Egg producers have pointed to the sharp increased in feed costs and no accompanying increase  
 96 in shell egg prices as harming the egg industry. We examine the relationship between shell  
 97 egg wholesale prices and the main egg input costs to determine if there is a break in the  
 98 relationship before and after the Covid-19 pandemic. We then estimate what prices would  
 99 have been had the pre-pandemic relationship persisted.

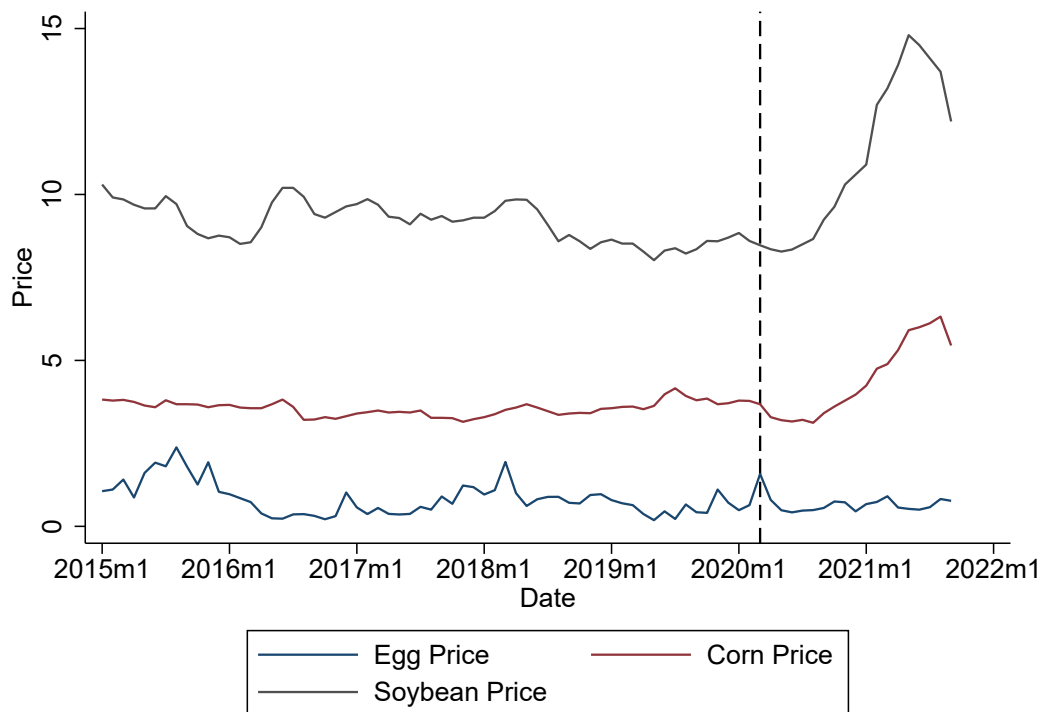
## 100 4 Methodology

101 We examine historical prices of inputs in egg production and wholesale egg prices to de-  
 102 termine the relationship between input and output prices in the egg market. We employ  
 103 a vector-error-correction model (VECM) to estimate this relationship (Engle and Granger,  
 104 1987). First, we estimate the model on data from January 2015 through March 2020 to es-  
 105 tablish the pre-pandemic price relationship. To assess the impact of price gouging lawsuits,  
 106 we estimate estimate the following VECM (Engle and Granger, 1987):

$$\Delta j_t = \alpha^j z_{t-1} + \sum_{i=1}^2 \left( \gamma_i^j(L) \Delta \text{Egg}_{t-i} + \delta_i^j(L) \Delta \text{Corn}_{t-i} + \lambda_i^j(L) \Delta \text{Soy}_{t-i} + \eta_i^j(L) \Delta \text{Diesel}_{t-i} \right) + e_t^j \quad (1)$$

107 where  $\Delta j_t; j \in \{\text{Egg, Corn, Soybean, Diesel}\}$  is the difference between price  $j$  (expressed in

Figure 5: Egg Wholesale and Input Prices



Source: USDA

108 natural logarithmic form) at month  $t$  and  $t - 1$ . The VECM is estimated with a double-lag  
 109 structure, as is the optimal lag specification according to the Akaike Information Criterion  
 110 (AIC) (Akaike, Petrov and Csaki, 1973). This paper applies the methodology established in  
 111 (Carter, Schaefer and Scheitrum, 2021).

112 Coefficient estimates describing the historical long-run equilibrium relationships between  
 113 shell-egg and price shifter prices are reported in Table 1. Referring to the estimates in Table  
 114 1, we see that the error correction term  $\alpha$  in the shell-egg equation is negative and statistically  
 115 significant at 99%. This suggests that monthly shell-egg prices adjust downward to correct  
 116 short-run deviations from the long-run trend. The estimated value of the error correction  
 117 parameter  $\alpha = -0.18$  indicates that (on average) the monthly shell-egg price adjusts to  
 118 correct 17.8% of any deviation from the long-run trend. The magnitude and significance of  
 119 the error correction parameter indicates that price deviations from long-run equilibrium are  
 120 corrected relatively quickly.



Table 1: Supply-Shifter VECM Coefficient Estimates

<b>Short-Run Equation</b>			
	Variable	Value	
$\Delta$ Egg	$\alpha$	-0.18 (0.06)	
	$\Delta$ Egg $_{t-1}$	-0.29 (0.12)	
	$\Delta$ Corn $_{t-1}$	-0.80 (2.01)	
	$\Delta$ Soybean $_{t-1}$	0.82 (2.37)	
	$\Delta$ Diesel $_{t-1}$	-2.53 (1.91)	
	constant	0.00 (0.05)	
	$\Delta$ Corn	$\alpha$	0.00 (0.01)
		$\Delta$ Egg $_{t-1}$	0.00 (0.00)
$\Delta$ Corn $_{t-1}$		0.00 (0.21)	
$\Delta$ Soybean $_{t-1}$		0.00 (0.14)	
$\Delta$ Diesel $_{t-1}$		0.00 (0.19)	
constant		0.15 (0.00)	
$\Delta$ Soybean		$\alpha$	0.00 (0.01)
		$\Delta$ Egg $_{t-1}$	0.00 (0.01)
	$\Delta$ Corn $_{t-1}$	0.00 (0.01)	
	$\Delta$ Soybean $_{t-1}$	0.00 (0.28)	
	$\Delta$ Diesel $_{t-1}$	0.00 (0.34)	
	Constant	0.11 (0.00)	
	$\Delta$ Diesel	$\alpha$	0.00 (0.00)
		$\Delta$ Egg $_{t-1}$	0.00 (0.01)
$\Delta$ Corn $_{t-1}$		0.00 (0.28)	
$\Delta$ Soybean $_{t-1}$		0.00 (0.15)	
$\Delta$ Diesel $_{t-1}$		0.00 (0.37)	
constant		0.14 (0.00)	
<b>Long-Run Equation<sup>†</sup></b>			
Ln Corn Price			2.25 (3.27)
Ln Soybean Price		-12.50 (2.92)	
Ln Diesel Price		-6.03 (1.47)	
Constant		26.74	

Note: Degrees of Freedom = 54.

 $\Delta$  denotes variable is first-differenced. Standard errors in parentheses.<sup>†</sup>Ln Egg Price normalized to 1 in each equation.

121 We use the predicted dynamic equilibrium relationships in Table 1 to generate a coun-  
122 terfactual series of shell egg prices that would have resulted from March 2020–September  
123 2021. Figure 6 plots counterfactual prices versus actual shell egg prices (specified in natural  
124 logarithmic form) for each region. We generate confidence intervals for these out-of-sample  
125 counterfactual prices using a Bayesian bootstrapping procedure with re-sampled draws from  
126 the posterior distributions of our predicted error correction coefficient in equation (1).

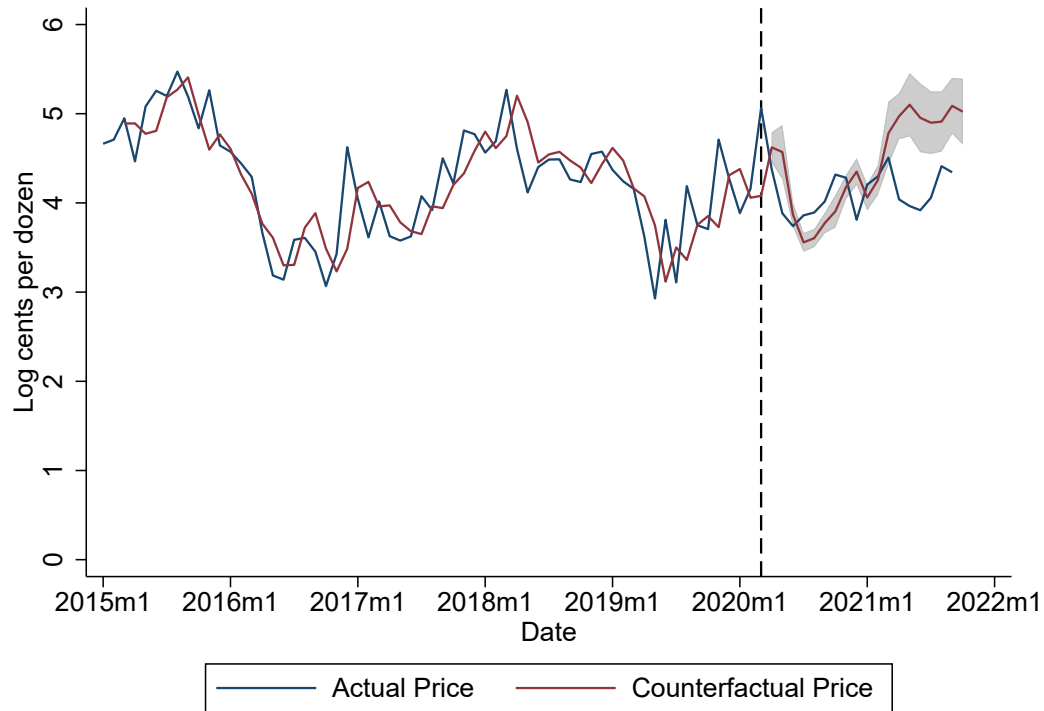
## 127 5 Results

128 Egg prices are largely determined by the price of inputs like corn, soybeans, and energy  
129 (Carter, Schaefer and Scheitrum, 2021). Shortly after the initial pandemic lockdowns, egg  
130 prices returned to their pre-pandemic levels (Malone, Schaefer and Lusk, 2021), yet input  
131 prices climbed dramatically. The margin producers receive has declined sharply following  
132 these price gouging suits; suggesting food retailers are unwilling to pay increased prices likely  
133 due to fear of litigation. Using USDA data on volumes sold and number of advertisements  
134 placed, our results indicate that the quantity of food retailer purchases and advertisements of  
135 eggs have plummeted following the price gouging litigations and suggests retailers are willing  
136 to accept empty shelves in lieu of increasing prices. Further, the relationship between the  
137 prices of inputs in egg production and wholesale egg prices changed fundamentally following  
138 the onset of the COVID-19 pandemic. Figure 6 shows that egg prices have stayed depressed  
139 through 2021, below where the historical relationship suggests these prices should be given  
140 the dramatic rise in input costs.

## 141 6 Discussion and Conclusion

142 When large retailers, with an aversion to possible litigation, respond by rigidly adhering to  
143 typical price levels, producers facing higher production costs will be unwilling or unable to  
144 supply these large retailers. Given the perishability of commodities, producers will be forced

Figure 6: Price Impact



Source: USDA

145 to attempt to store unsalable product, take prices that don't cover costs of production, or  
 146 find alternative market outlets. Consumers are also harmed by retailers' pricing strategies if  
 147 they are unable to purchase the quantity of eggs they desire, are forced to substitute toward  
 148 alternative protein sources, or forgo protein altogether. Food shortages and empty shelves  
 149 harm both producers and consumers, especially the most economically. In light of retailers'  
 150 pricing strategies, states need to revisit their price gouging protections in order to afford  
 151 more economic-based considerations to define future violations.

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