IMPLICIT PRICE AND DEMAND IN OLIGOPOLISTIC COMPETITION: AN APPLICATION TO THE U.S. TROUT MARKET

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THEORETICAL DEVELOPMENT OF IMPLICIT PRICE AND DEMAND IN OLIGOPOLISTIC COMPETITION: AN APPLICATION TO THE U.S. TROUT MARKET

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This study provides an example of how implicit price and demand models can be developed and used for empirical analysis. In particular, empirical application of these models can quantify the impact of implicit economic variables representing preference, relative price, production efficiency, the degree of price sensitivity to quantity supplied, and substitutability on market price and demand for domestic and imported products. Furthermore, the simultaneous impact of these implicit economic variables on market price and demand can be quantified using these implicit price and demand models.

In import demand analyses, previously developed economic models have been based on explicit economic variables such as price and quantity. For example, Armington (1969) used source differentiated quantity and corresponding price variables in developing an import demand model. Recently, Moschini and Rizzi (2007) developed a flexible mixed demand system using mainly price and quantity variables by which they estimated vegetable demand in Italy . Seale, Marchant, and Basso (2003) used a demand system model in which price and quantity are major variables employed to analyze demand for domestic and imported wines. Asche, Bremnes, and Wessells (1999) used cointegration methodology in which fish price and quantity variables are used to describe market integration and product aggregation. Many other studies have used explicit economic variables for demand analysis (Asche, Salvanes, and Steen, 1997; Eales, Durham, and Wessells, 1997; Bose and McIlgorm, 1996; Barten and Bettendorf, 1989; Holt and Bishop, 2002; Park, Thurman, and Easley, 2004; Lee and Kennedy, 2008 and 2009).

Even though these models provide quantitative understanding of extraneous market behavior, pertinent economic information related to the inner workings of those markets could not be obtained. For example, while these studies can answer questions about how a change in a

commodity's price affects market demand or how a change in supply affects price, they cannot, . however, answer questions about how a change in consumer preference influences market price and demand. Furthermore, there are other important implicit economic variables (e.g., price difference, production efficiency, price responsiveness, and substitutability) which provide internal information about market behavior. However, no studies were found that have sought to identify these implicit economic variables' effects on market behavior. As such, this study is motivated to develop an economic model whose aim is to identify the roles these implicit variables play in determining market behavior.

To attain this objective, we adopt a different route as compared to previous studies which primarily used explicit economic variables. In our study, we use Constant Elasticity of Substituion (CES) utility and Cournot profit to derive implicit price and demand equations because they include these implicit economic variables but also represent the market well for the purposes of our empirical application.[1] In addition, our definition of price difference complements an implicit price equation. Implied by Cournot profit, this study assumes few suppliers and includes domestic producers and importers in the market.

This study proceeds as follows. In the next section, the connection between utility and semi-implicit demand functions is examined and discussed.[2] In section three, we derive an implicit price equation and define it in terms of expenditure share (representing consumer preference), price transmission (representing price difference), marginal cost (representing production efficiency), commodity elasticity (representing sensitivity of price on quantity), and elasticity of substitution (representing substitutability between two different commodities). The semi-implicit demand function is then redefined in terms of these implicit economic variables. In section four, we empirically apply the developed model to the U.S. trout industry. In doing so,

we identify the effects these implicit economic variables have on domestic price and demand for domestic and imported trout. In the final section we conclude the study with suggestions for future research.

Semi-Implicit Demand

In order to derive a semi-implicit demand function that is defined in terms of implicit and explicit economic variables, we define *utility* as:

(1) $u = \left[\sum_i \alpha_i q_i^\rho \right]^{\frac{1}{\rho}}$

where α_i represents consumer preference for commodity i, ρ represents substitutability between two commodities i and j and is assumed to be constant.

In order to eliminate price differences among commodities, we use a price transmission variable and define it as:

(2) $t_i = \dfrac{p - p_i}{p_i}$,

where p is the highest price among commodities and p_i is the price of commodity i so that $t_i \geq 0$. If commodities are price homogeneous, then all t_i's are zero. If commodities are price heterogeneous, then the t_i's are not zero and positive. From equation (2), we know $p_i = \dfrac{p}{1 + t_i}$.

Because we now have a convenient way to represent consumer preferences, we can begin to investigate consumer behavior. In doing so, our basic assumption is that a rational consumer will always choose the most preferred good. With this is mind, we can then define the utility maximizing condition by using equations (1) and (2) and specify it as:

(3) $\underset{q_i, \lambda}{Max} \; u = \left[\sum_i \alpha_i q_i^\rho \right]^{\frac{1}{\rho}} + \lambda \left(1 - \sum_i p t_i q_i \right).$

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Since the utility function is continuous and the constraint set is positively closed and bounded, we can obtain a semi-implicit demand function for commodity i as follows:

(4) $q_i^d = f_i(\alpha_1, \ldots, \alpha_n, t_1, \ldots, t_{n-1}, \rho, p)$

Implicit Price

According to Cournot profit maximization, the supply of commodity i is defined as:

(5) $q_i^s = \dfrac{\gamma_i - t_i p}{e(Q)}$,

where $e(Q)$ is the aggregate quantity elasticity coefficient, $\dfrac{dp}{dQ}$, and $Q = \sum_i q_i$ is aggregate supply in the market.

Because quantity elasticity is negative ($dp(Q)/dQ \leq 0$), the price of commodity i, p_i ($= t_i p$), is greater than marginal cost, γ_i. Therefore, equation (5) can be rewritten as:

(6) $q_i^s = \dfrac{t_i p - \gamma_i}{|e|}$.

At market equilibrium for commodity i, $q_i^d = q_i^s$. As a result, we can obtain an implicit price function for commodity i using equations (4) and (6). The implicit price function can be expressed only by implicit economic variables such as expenditure share, price transmission, marginal cost, and the absolute aggregate quantity elasticity coefficient, and is specified as:

(7) $p = g(\alpha_1, \ldots, \alpha_n, t_1, \ldots, t_n, \gamma_1, \ldots, \gamma_n, \rho, |e|)$.

Now, by inserting equation (7) into equations (5) or (6), we can obtain the implicit demand equation defined in terms of these implicit economic variables as:

(8) $q_i = h_i(\alpha_1, \ldots, \alpha_n, t_1, \ldots, t_n, \gamma_1, \ldots, \gamma_n, \rho, |e|)$.

Empirical Application

In order to apply implicit price and demand empirically, we examine the U.S. trout industry. Before applying the implicit equations, we assume that there are two aggregate suppliers (i.e., a domestic producer and an importer). In the U.S. trout market, the domestic price is typically higher than the imported price. Therefore, we simplify the utility maximizing condition defined in equation (3) as:

(9) $\quad \underset{q_i,\lambda}{Max} \ u = \left[\alpha_i q_d^\rho + (1-\alpha)q_m^\rho\right]^{\frac{1}{\rho}} + \lambda(1 - p_d q_d - t p_d q_m),$

Ex ante, we know:

(10.1) $\quad t = \dfrac{p_d - p_m}{p_m} \quad$ and

(10.2) $\quad p_m = \dfrac{p_d}{1+t}.$

Using Shephard's Lemma, the implicit demand equations for domestic and imported products can be derived from equation (9) as:

(11.1) $\quad q_d^d = \dfrac{(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}}}{\left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + \left(\alpha^{\frac{1}{\rho-1}}\right)\right]p_d},$

(11.2) $\quad q_m^d = \dfrac{(1+t)(\alpha)^{\frac{1}{\rho-1}}}{\left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + \left(\alpha^{\frac{1}{\rho-1}}\right)\right]p_d}.$

Now, from the Cournot market assumption, we can define the domestic supply equation as:

(12) $\quad q_d^s = \dfrac{p_d - \gamma_d}{|e|}.$

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As a result, we can obtain the domestic price equation as:

$$
(13) \quad p_d = \frac{\gamma_d}{2} \pm \frac{\left\{ \left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + (\alpha)^{\frac{1}{\rho-1}} \right]^2 \gamma_d^2 + 4\left[(1+t)^{\frac{2\rho}{\rho-1}}(1-\alpha)^{\frac{2}{\rho-1}} + (1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}}(\alpha)^{\frac{1}{\rho-1}} \right]|e| \right\}^{\frac{1}{2}}}{2\left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + (\alpha)^{\frac{1}{\rho-1}} \right]}
$$

From equation (13), we can identify the marginal effects of these implicit variables such as expenditure share, price transmission, marginal cost, aggregate quantity elasticity coefficient, and elasticity of substitution on domestic price. Furthermore, equation (13) can be inserted into equations (10.1) and (10.2) to obtain the implicit demand equation for both domestic and imported trout. This is expressed as:

(14.1)

$$
q_d = \frac{(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}}}{\left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + \left(\alpha^{\frac{1}{\rho-1}}\right) \right]\left[\frac{\gamma_d}{2} \pm \frac{\left\{ \left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + (\alpha)^{\frac{1}{\rho-1}} \right]^2 \gamma_d^2 + 4\left[(1+t)^{\frac{2\rho}{\rho-1}}(1-\alpha)^{\frac{2}{\rho-1}} + (1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}}(\alpha)^{\frac{1}{\rho-1}} \right]|e| \right\}^{\frac{1}{2}}}{2\left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + (\alpha)^{\frac{1}{\rho-1}} \right]} \right]}
$$

(14.2)

$$q_m^d = \frac{(1+t)(\alpha)^{\frac{1}{\rho-1}}}{\left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + \left(\alpha^{\frac{1}{\rho-1}}\right)\right]\left[\dfrac{\gamma_d}{2} \pm \dfrac{\left\{\left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + (\alpha)^{\frac{1}{\rho-1}}\right]^2 \gamma_d^2 + 4\left[(1+t)^{\frac{2\rho}{\rho-1}}(1-\alpha)^{\frac{2}{\rho-1}} + (1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}}(\alpha)^{\frac{1}{\rho-1}}\right]|e|\right\}^{\frac{1}{2}}}{2\left[(1+t)^{\frac{\rho}{\rho-1}}(1-\alpha)^{\frac{1}{\rho-1}} + (\alpha)^{\frac{1}{\rho-1}}\right]}\right]}$$

From equations (14.1) and (14.2) we can identify the marginal effects of these implicit economic variables (e.g., expenditure share, price transmission, marginal cost, aggregate quantity elasticity coefficient, and elasticity of substitution) on the demand for domestic and imported trout.

Simulation

Due to the complexity of the empirical implicit price and demand equations, this study employs simulation techniques to identify the marginal effects of these implicit variables on domestic price and consumption of domestic and imported products. Before simulating, we estimate the aggregate quantity elasticity coefficient using annual price and aggregate quantity data from 1989 to 2007. The estimated aggregate quantity elasticity is used to calculate marginal cost in equation (11). In order to calculate the substitution elasticity, we calculate i) price transmission in equation (2) in which domestic price is greater than imported price, and ii) expenditure share for domestic products. Finally, the substitution elasticity is calculated in either equation (10.1) or equation (10.2). The mean estimated parameter values of these implicit economic variables for the study's sample period are reported in Table 1.

[Place Table 1 Approximately Here]

The advantage of these implicit price and demand models is to quantify the impact that these implicit economic variables have on both price and quantity. For example, after obtaining mean parameter values for all the specified implicit economic variables, we can simulate equation (13) for domestic price, equation (14.1) for domestic trout consumption, and equation (14.2) for imported trout consumption in order to quantify the effect of each implicit economic variable on domestic price and consumption of both domestic and imported products. First, we calculate domestic price and consumption of domestic trout, and consumption of imported trout at the mean values for these implicit economic variables. We then individually change the mean value of each implicit economic variable to obtain new domestic price and consumption of domestic and imported trout at the new value of each implicit economic variable and at the mean values for the other variables. Finally, we calculate the difference between the former and latter values for domestic price and consumption of both domestic and imported trout in order to identify the effect of each implicit economic variable on domestic price and consumption of domestic trout and on consumption of imported trout. Table 2 shows the simulation results.

[Place Table 2 Approximately Here]

In order to quantify what impact a change in expenditure share would have on price and quantity, this study simulates equations (13), (14.1), and (14.2) by reducing the estimated mean value of expenditure share while concurrently maintaining the mean values of all the other variables.[3] The simulation result shows that a decrease in expenditure share for domestic trout reduces domestic price and consumption of domestic trout while notably increasing demand for imported trout. A decrease in preference for domestic trout significantly decreases consumption of domestic trout and significantly increases consumption of imported trout even though a decrease in preference reduces the price for domestic products. As seen in Table 2, a 10%

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decrease in expenditure share for domestic trout decreases domestic price by 4.6% and decreases

consumption of domestic trout by 5.1%, while increasing consumption of imported trout by 19%.

Next, we simulate equations (13), (14.1), and (14.2) to quantify the impact that a change

in price transmission has on domestic price, consumption of domestic trout, and consumption of

imported trout.[4] Price difference between domestic and imported trout has decreased during the

sample period of time because domestic price has been relatively constant (or slightly decreased

even) while the imported price has largely increased during that time. Therefore, we reduce the

mean value of the price transmission variable to better identify the impact that an additional

decrease in price difference between domestic and imported trout has on the domestic price and

consumption of domestic trout, and consumption of imported trout. As seen in Table 2, a

decrease in price transmission does not influence domestic price and consumption of domestic

trout while consumption of imported trout decreases. This result is consistent with our

expectation because a decrease in price difference between domestic and imported trout will

decrease the impact of imports on domestic price but also reduce imports. Therefore, this result

implies that the recent increase in trout imports may not be explained by simply considering the

imported trout price. According to this simulation result, a 10% decrease in price transmission

does not influence domestic price or consumption of domestic trout, but decreases consumption

of imported trout by 0.5%.

Marginal cost in producing products is one of the factors affecting price. In order to

identify the impact of production efficiency on domestic price which, consequently, influences

consumption, we simulate equations (13), (14.1), and (14.2), reducing the mean value of

marginal cost. When marginal cost decreases, domestic price decreases while the consumption of

domestic and imported trout is shown to increase. However, the increase in the consumption of

domestic trout is notably greater than the increase in the consumption of imported trout. This result occurs because a decrease in domestic price enhances the price competitiveness of domestic trout, resulting in a higher expenditure share for domestic trout. At the same time, a decrease in the price difference between domestic and imported trout results from a decline in the domestic price, thus decreasing consumption of imported trout. According to the results, a 10% decrease in marginal cost decreases domestic trout price by 1.02%, increases domestic trout consumption by 0.93% and increases the consumption of imported trout by 0.11%.

This study tries to identify the impact of the degree of price sensitivity to quantity supplied on domestic price, consumption of domestic trout, and consumption of imported trout. In other words, when aggregate quantity elasticity increases, how do domestic price, and consumption of domestic and imported trout respond? According to the simulation results, when aggregate quantity elasticity increases, domestic price increases while consumption of domestic and imported trout decreases. This result shows that when domestic price becomes more sensitive to quantity supplied, both domestic producers and importers reduce their supply to prevent price from declining. A 10% increase in aggregate quantity elasticity increases domestic price by 0.45% while decreasing consumption of domestic trout by 0.40% and consumption of imported trout by 0.05%. This result shows that the domestic producer is more sensitive to a decline in price than is the importer.

Finally, this study identifies the impact that substitutability between domestic and imported trout has on the domestic price and consumption of domestic trout and consumption of imported trout. However, substitutability has very little effect on price and consumption.

Hereafter, this study simulates the implicit price and demand equations by changing two implicit variables simultaneously to identify the impact that the two implicit economic variables

have on the domestic price, consumption of domestic trout, and consumption of imported trout. For example, we simulate the price equation, simultaneously changing expenditure share and price transmission variables to determine the effect a simultaneous change in consumer preference and price difference has on the domestic price, consumption of domestic trout, and consumption of imported trout. Table 3 shows the simulation results.

When a 10% decrease in expenditure share occurs, price transmission decreases domestic price by 0.45% and consumption of domestic trout by 0.50% while increasing consumption of imported trout by 1.23%. Even though domestic price decreases, consumption of domestic trout is shown to decrease. This result shows the importance of consumer preference in the consumer purchasing decision. Furthermore, this result suggests that the domestic trout industry should seek to develop new products in order to attract consumer preference in light of increasing price competition.

In order to identify the impact a simultaneous change in consumer preference and production efficiency has on domestic price and consumption of domestic and imported trout, this study simulates equations (13), (14.1), and (14.2), reducing expenditure share and marginal cost by 10%. In this case, the domestic price for trout decreases while consumption of domestic and imported trout increases. However, the increase of consumption of imported trout is greater than that of domestic trout. This implies that the effect of decreasing price on domestic trout can be reduced notably by a decrease in consumer preference for domestic trout. According to the simulation result, a 10% decrease in expenditure share and marginal cost decreases the domestic trout price by 1.5% and increases domestic trout demand by 0.43% and for imported trout by 1.95%.

In order to identify the impact of a simultaneous change in expenditure share and price sensitivity to quantity supplied, simulations are conducted reducing expenditure share 10% and increasing aggregate quantity elasticity by 10%. Simulation results show that domestic price is only slightly affected and consumption of domestic trout decreases by 0.89%, while consumption of imported trout increases by 1.77%. When these results are compared to the case of a 10% decrease in expenditure share and a 10% increase in aggregate quantity elasticity, respectively, the impacts of the simultaneous change in expenditure share and aggregate quantity elasticity on domestic price and consumption of domestic and imported trout are remarkably small. This implies that even though consumer preference for imported trout increases, importers cannot increase the quantity imported by any large degree because the market price becomes more sensitive to quantity supplied.

To identify the impact of a simultaneous change in consumer preference and substitutability between domestic and imported trout, simulations are conducted reducing expenditure share by 10% and increasing elasticity of substitution by 10%. As expected, in this case, domestic price and demand for domestic trout decrease by 0.45% and by 0.50%, respectively, while consumption of imported trout increases by 1.82%.

In order to identify the impact of a simultaneous change in price difference and production efficiency, simulations are conducted reducing price transmission and marginal cost by 10%, respectively. According to the results, domestic price decreases by 1.02%. This result is similar to the result obtained from the simulation in which only marginal cost is reduced 10%. As seen in the previous result, the decrease in price transmission has little effect on domestic trout price because the price difference between domestic and imported trout stems mainly from

the increasing price of imported trout. Consumption of domestic trout increases by 0.93%, which is consistent with decrease in price, while consumption of imported trout decreases by 0.40%.

To identify the impact of a simultaneous change in price difference and price sensitivity to quantity supplied, simulations are conducted reducing price transmission by 10% and increasing aggregate quantity elasticity by 10%. According to the results, domestic price increases by 0.45% while consumption of domestic and imported trout decreases by 0.40% and 0.55%, respectively. In the previous result a 10% increase in only the aggregate quantity elasticity increases consumption of imported trout and decreases consumption of domestic trout. In this case, however, consumption of imported trout decreases. This implies that if the price difference between domestic and imported trout is not very great, domestic suppliers will not only reduce their supply but imports will decrease in order to prevent trout prices from declining precipitously.

In order to identify the impact that a simultaneous change in both price difference and substitutability would have, simulations are conducted where price transmission is reduced by 10% and the elasticity of substitution is increased by 10% . According to simulation results, these changes have little influence on domestic price and consumption of domestic trout while decreasing consumption for imported trout by 0.5%. These results are similar to the previous results shown in Table 2.

To identify the impact a simultaneous change in domestic production efficiency and price sensitivity has on quantity supplied, simulations are conducted reducing marginal cost by 10% and increasing the aggregate quantity elasticity by 10%. Results show that domestic price decreases by 0.57% while consumption of domestic and imported trout increases by 0.52% and

0.06%, respectively. The increase in consumption of domestic trout is much larger than that for imported trout. This may be because the domestic trout price decreases.

In order to identify the impact that a simultaneous change in domestic production efficiency and substitutability have on the market interaction between domestic and imported trout, simulations are conducted reducing marginal cost 10% and increasing the elasticity of substitution by 10%. As seen in Table 3, domestic price decreases by 1.02% while consumption of domestic and imported trout increases by 0.93% and by 0.11%, respectively. Finally, in the case in which price responsiveness to quantity supplied and substitutability simultaneously increase, domestic price increases by 0.45% while consumption of domestic and imported trout is shown to decrease by 0.40% and by 0.05%, respectively.

Conclusion

This study shows how implicit price and demand models can be developed and how models can be used for empirical analysis. In particular, empirical application of these models can quantify the impact of implicit economic variables' on domestic price and quantity demanded. For example, expenditure share is used in the implicit price and demand equations to quantify the impact of consumer preference on domestic price and demand. This approach provides a convenient way to quantify the impact of price difference, production efficiency, price responsiveness to quantity, and substitutability on domestic price and demand. Furthermore, this methodology provides a means to quantify the simultaneous impact of these implicit economic variables on price and demand.

This analytical methodology was used to analyze the U.S. trout market. Through the use of equations (13), (14.1) and (14.2), this study quantifies the impact of 1) consumer preferences, 2) price differences between domestic and imported trout, 3) the production efficiency of

domestic trout producers, 4) the degree of price sensitivity to quantity in the U.S. trout market, and 5) substitutability between domestic and imported products on the domestic trout price and consumption of domestic and imported trout. In particular, the results of the empirical analyses provide evidence that these implicit economic variables independently and simultaneously influence price and demand.

As an initial step for the development of an implicit economic model, this study uses a relatively simple utility and market assumption. However, this underlying assumption can be relaxed to include more realistic market circumstances. For example, as opposed to this analysis, the reaction function between leading and following products can be identified. This reaction function can provide additional information about the particular market under consideration. Various different iterations of this framework can be used to provide useful information to industry and government officials alike.

Footnote 1.

In a Cournot oligopolistic market, the reaction function will be zero, $\frac{\partial q_i}{\partial q_j} = 0$.

Footnote 2.

We call a semi-implicit demand function a demand function because it not only includes implicit economic variables such as preference, elasticity of substitutability, and price transmission but also includes explicit economic variables (e.g., price).

Footnote 3.

Expenditure share for domestic trout has decreased during the sample period while expenditure share for imported trout has increased. In order to identify the impact that an additional decrease in expenditure share would potentially have on domestic trout, this study simulates implicit price and demand models by reducing the expenditure share for domestic trout.

Footnote 4.

As equation (10.1) shows, price transmission implies the degree of price difference between domestic and imported trout. An increase in price transmission represents an increase in price difference between domestic and imported trout.

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Table 1. Mean Values of Implicit Economic Variables

Preference	α	0.9453
Price Transmission	t	0.9723
Marginal Cost	γ	6.611E-09
Quantity Elasticity	$|\hat{e}|$	1.08E-15
Elasticity of Substitution	ρ	2.213E-07

Table 2. Impact of Individual Implicit Economic Variable on Price and Quantity

	α (↓10%)	t (↓10%)	γ (↓10%)	$|\hat{e}|$ (↑10%)	ρ (↑10%)
p_d (Δ%)	-4.60323	0.00000	-1.02246	0.44754	0.00000
q_d (Δ%)	-5.07771	0.00000	0.92721	-0.39990	0.00000
q_m (Δ%)	19.05140	-0.50497	0.10582	-0.04564	-0.00009

Table 3. Impacts of Set of Implicit Economic Variables on Price and Quantity

	α (↓10%) +	*t* (↓10%)	γ (↓10%)	|ê| (↑10%)	ρ (↑10%)
p_d (Δ%)		-0.44976	-1.47267	-0.00449	-0.44976
q_d (Δ%)		-0.49611	0.43060	-0.89358	-0.49611
q_m (Δ%)		1.22965	1.94985	1.77083	1.82457
		t (↓10%) +	γ (↓10%)	|ê| (↑10%)	ρ (↑10%)
p_d (Δ%)			-1.02246	0.44754	0.00000
q_d (Δ%)			0.92721	-0.39990	0.00000
q_m (Δ%)			-0.40437	-0.54836	-0.50497
			γ (↓10%) +	|ê| (↑10%)	ρ (↑10%)
p_d (Δ%)				-0.57448	-1.02246
q_d (Δ%)				0.51862	0.92721
q_m (Δ%)				0.05919	0.10581
				|ê| (↑10%) +	ρ (↑10%)
p_d (Δ%)					0.44754
q_d (Δ%)					-0.39990
q_m (Δ%)					-0.04564