Does Private Label Ownership and Pricing Structure Matter?

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Abstract

This article provides an analysis of the two-stage game between manufacturers and

retailers. Response functions showing how prices are set are derived for the case of a

manufacturer producing one and multiple goods and for a retailer selling multiple goods.

The functions are expressed in terms of elasticities, budget shares, and variable

production costs. An application using ready-to-eat cereals is conducted to investigate the

pricing structure and ownership of private label cereals.

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Introduction

Much work has been done in recent years concerning private label and national brands. The analyses have looked into the explosion of private label goods on the market, the competition with national brands, pricing strategies, and reasons for a retailer to introduce a private label good. The price competition between national brands and private label brands has largely been observed and studied at the retail level. Usually price games are analyzed to see which good is leading or affecting the other goods and prices. Many of these studies also look at what types of promotions and the level of advertising used for each type of good.

"The extant literature on private labels has not directly addressed the strategic role of private labels in the channel relationship between the national brand manufacturers and the retailer."(Narasimhan). The relationship between the manufacturers producing the private label goods and the retailers selling them is an important issue. It is of interest to know who owns production or contracts to produce these private label goods and what effect this has on the pricing of goods at the manufacturer and retail level. Dunne(1996) states that it is rare for a manufacturer of a national brand to supply a private label good because consumers may learn of this and no longer buy the national brand if the goods are perceived to be the same. Giblen(1993) notes that retailers utilize private label goods as bargaining tools against national branded manufacturers. However, some national brand manufacturers do in fact produce private label goods. Also, the retailer could produce its own good or contract for the private label good with a non-national brand supplier. Several different market structures exist.

This article seeks to analyze three different market structures to observe the prices, quantity of goods sold, and profits for the firms involved. All cases will involve a single retailer. Manufacturers will produce and sell national branded goods and private label goods to retailers. In case one there will be national brand manufacturers and a separate manufacturer producing the private label good. In case two the private label good is produced by the retailer and the national brands are supplied from other manufacturers. Lastly, case three will consist of manufacturers of a national brand firm that also contract with the retailer to produce private label goods.

The first section of this article will obtain pricing response functions for the retailer and manufacturers. The market structure cases to be analyzed then will be discussed in greater detail. Following this, an empirical example using ready-to-eat cereals will be conducted. Results will then be discussed and conclusions will be drawn for the different cereal market structures.

Response Functions-Retailer

This outlay is based on the work of Iwata(1974).

Retailer's Profit

$$\pi_r = \sum_i (P_i - W_i) Q_i (P_i, P_j), \text{ for all } i$$

where Pi is retail price of good i , Wi is the manufacturer price , Qi is quantity of i sold

Pj's are retail prices of other brands the retailer sells in the same category with i

First Order Conditions

Since it is assumed that the retailer control prices. First order conditions are derived with respect to retail price.

$$\partial \pi_r / \partial P_i = Q_i(P_i, P_j) + (P_i - W_i)\frac{\partial Q_i(P_i, P_j)}{\partial P_i} + (P_j - W_j)\frac{\partial Q_j(P_i, P_j)}{\partial P_i} = 0$$

$$\partial \pi_r / \partial P_j = Q_j(P_i, P_j) + (P_i - W_i)\frac{\partial Q_i(P_i, P_j)}{\partial P_j} + (P_j - W_j)\frac{\partial Q_j(P_i, P_j)}{\partial P_j} = 0$$

Placing these FOC's into elasticity and budget share form:

$$\partial \pi_r / \partial P_i = S_i + \frac{(P_i - W_i)}{P_i}E_{ii}S_i + \frac{(P_j - W_j)}{P_j}E_{ji}S_j = 0$$

$$\partial \pi_r / \partial P_j = S_j + \frac{(P_i - W_i)}{P_i}E_{ij}S_i + \frac{(P_j - W_j)}{P_j}E_{jj}S_j = 0$$

By placing into matrix form the retail prices can be solved for in terms of manufacturer

prices, shares, and elasticities.

$$\begin{bmatrix} E_{ii}S_i & E_{ji}S_j \\ E_{ij}S_i & E_{jj}S_j \end{bmatrix} \begin{bmatrix} \dfrac{(P_i - W_i)}{P_i} \\ \dfrac{(P_j - W_j)}{P_j} \end{bmatrix} = \begin{bmatrix} -S_i \\ -S_j \end{bmatrix}$$

Solve for Pi's and Wi's

$$\begin{bmatrix} \dfrac{(P_i - W_i)}{P_i} \\ \dfrac{(P_j - W_j)}{P_j} \end{bmatrix} = \begin{bmatrix} E_{ii}S_i & E_{ji}S_j \\ E_{ij}S_i & E_{jj}S_j \end{bmatrix}^{-1} \begin{bmatrix} -S_i \\ -S_j \end{bmatrix} = \begin{bmatrix} V_i \\ V_j \end{bmatrix}$$

$$\begin{bmatrix} \dfrac{(P_i - W_i)}{P_i} \\ \dfrac{(P_j - W_j)}{P_j} \end{bmatrix} = \begin{bmatrix} V_i \\ V_j \end{bmatrix}$$

Final response functions for retail prices in terms of manufacturer prices and

matrix products Vi and Vj are now solved. The matrix products Vi and Vj take into

account cross-price effects of the goods that the retailer sells. The retail price results in

the wholesale price and a multiplier.

$$P_i = W_i \left(\frac{1}{1 - V_i} \right)$$

$$P_j = W_j \left(\frac{1}{1 - V_j} \right)$$

Response Functions-Manufacturer-(1 good)

Next, a response function for the manufacturer is derived. The first case is if each manufacturer produces only one good.

Manufacturer's Profit

$$\pi_w = (W_i - C_i) Q_i (P_i, P_j) \text{ for each } i$$

where Ci is the cost of production of good i

First order conditions for the manufacturer

Since it is assumed that the manufacturer controls the price charged to the retailer. First order conditions are derived with respect to manufacturer's price.

$$\partial \pi_w / \partial W_i = Q_i (P_i, P_j) + (W_i - C_i) \frac{\partial Q_i (P_i, P_j)}{\partial P_i} \frac{\partial P_i}{\partial W_i} = 0 \text{ for each } i$$

Placing the FOC into elasticity form:

$$\partial \pi_w / \partial W_i = P_i + (W_i - C_i) E_{ii} \frac{\partial P_i}{\partial W_i} = 0$$

Portions from the response function for the retailer state that

$$P_i = W_i \left(\frac{1}{1 - V_i} \right) \text{ and } \frac{\partial P_i}{\partial W_i} = \frac{1}{1 - V_i}$$

The final response function is in terms of the production cost and own-price elasticity. The manufacturer price for the one good case does not consider cross price effects in the retail market.

$$W_i = \frac{C_i E_{ii}}{(1 + E_{ii})}$$

Response Functions-Manufacturer-(More than 1 good)

After deriving the response function for a manufacturer of only one good, the response

functions for a manufacturer producing more than one good are obtained. Cross-price

effects will enter the response functions since the two goods compete in the retail market.

Manufacturer's Profit

$$\pi_w = (W_i - C_i)Q_i(P_i, P_j) + (W_j - C_j)Q_j(P_i, P_j)$$

First order conditions for the manufacturer

Since it is assumed that the manufacturer controls its price charged to the retailer. First

order conditions are derived with respect to manufacturer's price.

$$\partial \pi_w / \partial W_i = Q_i(P_i, P_j) + (W_i - C_i)\frac{\partial Q_i(P_i, P_j)}{\partial P_i}\frac{\partial P_i}{\partial W_i} + (W_j - C_j)\frac{\partial Q_j(P_i, P_j)}{\partial P_i}\frac{\partial P_i}{\partial W_i} = 0$$

$$\partial \pi_w / \partial W_j = Q_j(P_i, P_j) + (W_i - C_i)\frac{\partial Q_i(P_i, P_j)}{\partial P_j}\frac{\partial P_j}{\partial W_j} + (W_j - C_j)\frac{\partial Q_j(P_i, P_j)}{\partial P_j}\frac{\partial P_j}{\partial W_j} = 0$$

Placing these FOC's into elasticity and budget share form:

$$\partial \pi_w / \partial W_i = S_i + \frac{(W_i - C_i)}{P_i}E_{ii}S_i\frac{\partial P_i}{\partial W_i} + \frac{(W_j - C_j)}{P_j}E_{ji}S_j\frac{\partial P_i}{\partial W_i} = 0$$

$$\partial \pi_w / \partial W_j = S_j + \frac{(W_i - C_i)}{P_i}E_{ij}S_i\frac{\partial P_j}{\partial W_j} + \frac{(W_j - C_j)}{P_j}E_{jj}S_j\frac{\partial P_j}{\partial W_j} = 0$$

By placing into matrix form the manufacturer's prices can be solved for in terms of

production costs, retail prices, shares, and elasticities.

$$\begin{bmatrix} E_{ii}S_i \dfrac{\partial P_i}{\partial W_i} & E_{ji}S_j \dfrac{\partial P_i}{\partial W_i} \\[2ex] E_{ij}S_i \dfrac{\partial P_j}{\partial W_j} & E_{jj}S_j \dfrac{\partial P_j}{\partial W_j} \end{bmatrix} \begin{bmatrix} \dfrac{\left(W_i - C_i\right)}{P_i} \\[2ex] \dfrac{\left(W_j - C_j\right)}{P_j} \end{bmatrix} = \begin{bmatrix} -S_i \\[1ex] -S_j \end{bmatrix}$$

Solve for Wi's, Pi's, and Ci's

$$\begin{bmatrix} \dfrac{\left(W_i - C_i\right)}{P_i} \\[2ex] \dfrac{\left(W_j - C_j\right)}{P_j} \end{bmatrix} = \begin{bmatrix} E_{ii}S_i \dfrac{\partial P_i}{\partial W_i} & E_{ji}S_j \dfrac{\partial P_i}{\partial W_i} \\[2ex] E_{ij}S_i \dfrac{\partial P_j}{\partial W_j} & E_{jj}S_j \dfrac{\partial P_j}{\partial W_j} \end{bmatrix}^{-1} \begin{bmatrix} -S_i \\[1ex] -S_j \end{bmatrix} = \begin{bmatrix} J_i \\[1ex] J_j \end{bmatrix}$$

$$\begin{bmatrix} \dfrac{\left(W_i - C_i\right)}{P_i} \\[2ex] \dfrac{\left(W_j - C_j\right)}{P_j} \end{bmatrix} = \begin{bmatrix} J_i \\[1ex] J_j \end{bmatrix}$$

Final manufacturer response functions are in terms of production costs and matrix products Ji and Jj from the manufacturer as well as portions of the retailer's response function, Vi and Vj. These can be found for all goods produced by the manufacturer. The manufacturer now prices their goods by taking into account the cross-price effects in the retail market in order to optimize profit.

$$W_i = \frac{C_i}{1 - V_i - J_i}$$

$$W_j = \frac{C_j}{1 - V_j - J_j}$$

Now that response functions have been expressed in matrix form, the V and J products will be explicitly expressed for in the context of a two good case. The elasticities and budget shares effects on manufacturer and retail prices will be shown.

Numeric solutions to the response functions can be retrieved with the previous forms in terms of matrix products. This presentation gives an in depth look at the functions.

Retailer Response Function – matrix product form

$$P_i = W_i\left(\frac{1}{1-V_i}\right)$$

$$P_j = W_j\left(\frac{1}{1-V_j}\right)$$

Retailer Response Function – elasticity form

$$P_i = W_i\left(\cfrac{1}{1-\left[-\cfrac{E_{jj}S_i - E_{ji}S_j}{S_i\left(E_{ii}E_{jj} - E_{ji}E_{ij}\right)}\right]}\right)$$

$$P_j = W_j\left(\cfrac{1}{1-\left[-\cfrac{-E_{ij}S_i + E_{ii}S_j}{S_j\left(E_{ii}E_{jj} - E_{ji}E_{ij}\right)}\right]}\right)$$

Manufacturer Response Function – elasticity form

Producing 1 good

$$W_i = \frac{C_i E_{ii}}{\left(1 + E_{ii}\right)}$$

Producing more than 1 good -(2 good case)

$$W_i = \frac{\left(C_i\left(-E_{ij}E_{ji} + E_{ii}E_{jj}\right)^2 S_i^2\right)}{\left(\begin{array}{l} -S_i\left(-E_{ij}E_{ji} + E_{ii}E_{jj}\right)S_i E_{ij}E_{ji} + S_i\left(-E_{ij}E_{ji} + E_{ii}E_{jj}\right)S_i E_{ii}E_{jj} \\ + 2S_i\left(-E_{ij}Eji + E_{ii}E_{jj}\right)E_{jj}S_i - 2S_i\left(-E_{ij}E_{ji} + E_{ii}E_{jj}\right)E_{ji}S_j + E_{jj}S_i E_{jj}S_i \\ - E_{jj}S_i E_{ji}S_j - E_{ji}S_j E_{jj}S_i + E_{ji}S_j\ E_{ji}S_j \end{array}\right)}$$

$$W_j = \frac{\left(C_j\left(-E_{ij}E_{ji} + E_{ii}E_{jj}\right)^2 S_j^2\right)}{\left(\begin{array}{l} -S_j\left(-E_{ij}E_{ji} + E_{ii}E_{jj}\right)S_j E_{ij}E_{ji} + S_j\left(-E_{ij}E_{ji} + E_{ii}E_{jj}\right)S_j E_{ii}E_{jj} \\ - 2S_j\left(-E_{ij}Eji + E_{ii}E_{jj}\right)E_{ij}S_i + 2S_j\left(-E_{ij}E_{ji} + E_{ii}E_{jj}\right)E_{ii}S_j + E_{ij}S_i E_{ij}S_i \\ - E_{ij}S_i E_{ii}S_j - E_{ii}S_j E_{ij}S_i + E_{ii}S_j E_{ii}S_j \end{array}\right)}$$

Market Structure Discussion

Now that all response functions have been developed, the three cases described earlier can be explored. For case one, the manufacturers establish their prices for each good that they produce and then the retailer responds. There is a separate manufacturer for each national brand and a separate manufacturer for the private label. Each manufacturer will price their good based on the own price elasticity and production cost to maximize profit. The retailer then appropriately prices to maximize total profit considering all goods sold.

In case two the retailer owns and produces the private label good. "Mills (1995) shows that private labels can serve as a "retailer instrument" for overcoming the double-marginalization problem, thereby improving the performance in the distribution channel."(Putsis). Thus, the markup given by the retailer/manufacturer for the private label good will be less in the manufacturer response function for the private label good and can then be priced lower in the retail market as a result. The other manufacturers will price as in case one. The retailer then prices as in case one but uses the lower level markup on the private label good that it produces in the response function.

In case three, a select manufacturer will be producing both their national brand and the private label good for the retailer. The manufacturer will impose the response

function for more than one good since it will know that the private label good it is producing will compete with its own brand. Since it has pricing control at this stage, it will alter the pricing decision charged to the retailer. Again, the other manufacturers and retailer will price as in case one.

An Example: ready-to-eat cereals

An empirical example using ready-to-eat cereals will now be conducted to explore these three market structures. The key analysis will be focused on private label ownership as previously discussed. First the data will be briefly described followed by the derivation of the needed elasticities for the response functions. Elasticities will be derived from a Rotterdam model. Lastly, Pi's, Qi's, Wi's, and profits for all firms will be retrieved for the cases and then results of the market structures will be discussed.

Data

The data used is publicly available scanner data obtained from the Kilts Center for Marketing, University of Chicago. The data is from Dominick's Finer Foods, a grocery store that operates over 100 stores in the Chicago area. The data contains approximately nine years of store level data. This analysis uses an 87-week period ranging from August 1995 until May 1997. The ready-to-eat breakfast cereals category was used. The price, unit sold, profit margin, week, UPC, and store are given for each store level purchase. All UPC's were aggregated to three national brands(Post, General Mills, Kellogg's), the private label brand(Dominick's), and a last category for all other cereals. This gives the necessary pieces to analyze the different market structures. A nice feature of this data is that the profit margin for each transaction is given along with market price.

Rotterdam Model

The Rotterdam model (Theil, Barten) will be used to retrieve elasticities for the ready-to-eat cereals. A systems approach is used since all cereals are interrelated and more efficient estimates can be retrieved. The model is also flexible and compatible with demand theory(Mountain). A recent article indicated that the Rotterdam system was appropriate for this type of data since the log-differencing helps overcome the common data issue of nonstationarity(Capps, Church, and Love). The model is now given.

Basic model

$$S_{it}Dq_{it} = a_i + b_i\left(\sum_j s_{jt}Dq_{jt}\right) + \sum_j c_{ij}Dp_{jt} + e_{it}$$

where D denotes the logarithmic first difference operator

$$Dx = \ln x_t - \ln x_{t-1}$$

where s_i : budget share of good i
$\quad\quad$ q_i : quantity of cereal i consumed
$\quad\quad$ p_j : price of cereal j(also includes own price pi)
$\quad\quad$ a, b, c : parameters to be estimated
$\quad\quad$ i ,: respective cereal

N-1 equations are estimated in a system using SUR. Homogeneity and adding up restrictions are enforced allowing the remaining estimates to be recovered.

$\quad\quad$ Homogeneity $\quad\quad\quad\quad$ $\sum_j C_{ij} = 0$ for all i
$\quad\quad$ Adding Up $\quad\quad\quad\quad\quad$ $\sum_i B_i = 0$

The theoretical assumption of symmetry will not be imposed on the system for this analysis. "Cross price elasticities are decidedly asymmetric with national brand price having a major impact on private label sales, whereas private label price has very little

impact on private label sales. This is consistent with the work on asymmetric competition and price tiers"(Cotterrill, Putsis) and (Cotterrill, Putsis, Dhar).

A serial autocorrelation correction is made to the basic system since times series data is being used. The final Rotterdam system used is the following:

$$S_{it}Dq_{it} = a_i + b_i\left(\sum_j s_{jt}Dq_{jt}\right) + \sum_j c_{ij}Dp_{jt} + \rho\left(S_{it-1}Dq_{it-1} - a_i - b_i\left(\sum_j s_{jt-1}Dq_{jt-1}\right) - \sum_j c_{ij}Dp_{jt-1}\right) + e_{it}$$

Compensated price elasticities and expenditure elasticities derived at the mean budget share are calculated as follows:

$$E_{ij}* = \frac{c_{ij}}{S_{mean(i)}}$$

$$N_i = \frac{b_i}{S_{mean(i)}}$$

Uncompensated price elasticities are calculated as follows:

$$E_{ij} = E_{ij}*-S_{mean(j)}N_i$$

Uncompensated elasticities are used in the previously derived first order conditions to obtain the optimal manufacturer and retail prices.

Results

The compensated and uncompensated elasticities for ready-to-eat cereals are given in the table 1. All own-price elasticities are negative and statistically significant from zero. All cereals were substitutes for each other as expected but were not all statistically significant substitutes. The elasticities were asymmetric concerning the private label and national brand relationships. Dominick's brand did not significantly affect any of the three national brands or the Other cereal brands. Two of the national brands, Kellogg's and

General Mills, did significantly affect the Dominick's brand. The uncompensated elasticities are used for the response functions.

The three cases of market structure were calculated and results are given in the table 2. For case one each manufacturer priced their own cereal. The retailer then priced. This gave the Pi's and Wi's. These were fed into the estimated demand systems to compute the quantity of each cereal sold and then profits were estimated for the retailer and manufacturers. In case one, the retailer's average weekly profit was 514,273 dollars. Kellogg's profit was the highest among the manufacturers since it sold the most. The average prices per ounce are also given under this case.

For case two the retailer now produced and owned the Dominick's brand. The markup was set to 80% of what would have occurred in case one to lower the realized price Wi. This is arbitrarily done to take into account the absence of double marginalization. Ownership of the production of the private label by the retailer results in a lower retail price being charged and an increased sales volume. However, total profit is lower for the retailer since the private label good is reducing sales of Post, General Mills, and Other cereals. The store was making a per unit profit on the sales of these goods so overall the effect of pricing their own good lower hurts their average weekly profit by nearly four thousand dollars.

Case three looks into the retailer contracting with one of the major suppliers of branded cereal to produce the private label. Three separate major manufacturers exist in this example; Post, General Mills, and Kellogg's. Results are found for the case of each firm producing the private label with the remaining manufacturers producing only their brand. In each case, the major firm takes into account the substitution effects of their

brand and the private label as outlined in the response functions for manufacturers producing more than one good. This results in the firms raising the price of the private label good charged to the retailer which transforms into a higher retail price. The ability to price this good is beneficial for each firm when they are allowed the chance to produce the private label good. Kellogg's exploits the pricing of the private label good greatly when compared to Post and General Mills.

The retailer earns the greatest profit in case three regardless of which manufacturer it contracts with. After analyzing the three separate market structures it appears that the retailer should contract to have the private label cereal made. The manufacturers are also best under this case and prefer to be the company supplying the private label cereal. This does not take into account the bargaining power retailers could gain from producing the private label goods. The retailers could still bargain over shelf space or other items if the goods were obtained from a contractor or outside producer.

Concluding remarks

An analysis of the two-stage game between manufacturers and retailers has been outlined. Response functions showing how prices are set have been derived for the case of a manufacturer producing one and multiple goods and for a retailer selling multiple goods. The functions were expressed in terms of elasticities, budget shares, and variable production costs so that an analysis could be easily performed. An application using ready-to-eat cereals was conducted to investigate pricing structure and ownership of private label cereals.

Table 1. Cereal Elasticities From the Rotterdam Model

Uncompensated Elasticities

	Post	*GM*	*Kellogg's*	*Dom. PL*	*Other*	*TE*
Post	-3.365	0.712	0.750	0.328	0.198	1.377
	[.000]	[.008]	[.002]	[.299]	[.387]	[.000]
GM	0.491	-2.487	0.694	0.010	0.304	0.989
	[.000]	[.000]	[.000]	[.949]	[.006]	[.000]
Kellogg's	0.161	0.495	-2.083	0.240	0.326	0.861
	[.216]	[.000]	[.000]	[.111]	[.003]	[.000]
Dom. PL	0.191	1.552	0.584	-3.225	0.393	0.506
	[.468]	[.000]	[.010]	[.000]	[.073]	[.015]
Other	0.190	0.554	0.672	0.078	-2.671	1.177
	[.314]	[.014]	[.012]	[.183]	[.000]	[.000]

Compensated Elasticities

	Post	*GM*	*Kellogg's*	*Dom. PL*	*Other*
Post	-3.190	1.136	1.260	0.384	0.409
	[.000]	[.000]	[.000]	[.220]	[.069]
GM	0.617	-2.182	1.060	0.050	0.455
	[.000]	[.000]	[.000]	[.738]	[.000]
Kellogg's	0.271	0.760	-1.764	0.275	0.458
	[.038]	[.000]	[.000]	[.065]	[.000]
Dom. PL	0.255	1.708	0.771	-3.204	0.470
	[.331]	[.000]	[.001]	[.000]	[.029]
Other	0.340	0.917	1.107	0.126	-2.490
	[.069]	[.000]	[.000]	[.029]	[.000]

Table 2. Results of the Three Market Structures

	BASE CASE		RETAILER OWNS PRIVATE LABEL (markups 80% of what base case would)		RETAILER CONTRACTS WITH BRAND TO MAKE PRIVATE LABEL					
					FIRM #1 POST		FIRM #2 GENERAL MILLS		FIRM #3 KELLOGG'S	
unit: $/week	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Profit Retailer	514273.7	84267.2	510328.5	85297.0	532299.6	92651.8	533815.5	97267.4	574518.7	116702.7
Profit Mfr #1 Post	20502.5	13338.6	20496.4	13333.3	35466.7	24374.0	21587.2	16728.4	22702.0	19795.8
Profit Mfr #2 GM	66007.3	29111.0	65252.5	28872.9	65708.8	32227.6	80053.4	34288.6	69968.9	48850.5
Profit Mfr #3 Kell	90701.5	39320.4	91385.0	39245.3	90730.1	42024.3	93059.9	46220.0	127355.8	436756.6
Profit Mfr #4 Dom PL	5507.8	2773.8	1952.9	2140.6						
Profit Mfr #5 Other	29298.1	17103.3	29466.5	17167.7	28846.8	17604.8	29755.8	19862.3	32507.3	23688.9
unit: oz/week	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Quantity #1 Post	600858.1	337975.3	600459.4	388317.4	986325.5	1464509.1	634069.3	469394.9	648298.4	540822.3
Quantity #2 GM	1216100.2	473322.2	1206206.4	470235.5	1214041.6	544322.1	1462533.8	1666797.4	1268036.9	838738.2
Quantity #3 Kell	1586243.3	668836.0	1596019.2	664449.8	1579193.1	691665.0	1609046.7	756519.4	1905974.7	1523226.0
Quantity #4 Dom PL	193338.4	87999.7	201906.5	116278.0	208605.9	148987.5	248438.3	257004.7	187998.7	69379.4
Quantity #5 Other	689608.3	362172.7	692987.2	363771.0	675148.8	366677.3	692444.2	429495.4	765239.1	561123.7
unit: $/oz	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Retail Price #1 Post	0.223	0.032	0.223	0.032	0.230	0.059	0.223	0.032	0.223	0.032
Retail Price #2 GM	0.273	0.030	0.273	0.030	0.273	0.030	0.288	0.063	0.273	0.030
Retail Price #3 Kell	0.250	0.037	0.250	0.037	0.250	0.037	0.250	0.037	0.264	0.079
Retail Price #4 Dom	0.236	0.028	0.189	0.022	0.296	0.064	0.248	0.053	0.568	0.122
Retail Price #5 Other	0.237	0.036	0.237	0.036	0.237	0.036	0.237	0.036	0.237	0.036
unit: $/oz	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Mfr Price #1 Post	0.119	0.017	0.119	0.017	0.122	0.031	0.119	0.017	0.119	0.017
Mfr Price #2 GM	0.138	0.015	0.138	0.015	0.138	0.015	0.145	0.032	0.138	0.015
Mfr Price #3 Kell	0.122	0.018	0.122	0.018	0.122	0.018	0.122	0.018	0.129	0.039
Mfr Price #4 Dom PL	0.098	0.012	0.078	0.009	0.123	0.026	0.103	0.022	0.236	0.051
Mfr Price #5 Other	0.117	0.018	0.117	0.018	0.117	0.018	0.117	0.018	0.117	0.018

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