Food Marketing Policy

Issue Paper

**A PowerPoint® Deconstruction of the Farm and Retail Price Analysis
Presented in
"The Public Interest and
Private Economic Power:
A Case study of the Northeast Dairy Compact"**

by

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In this paper we interpret and explain in more detail the economic analysis contained in our report, The Public Interest and Private Economic Power: A Case Study of the Northeast Dairy Compact. This paper contains a graphic deconstruction of the price analysis that is presented in that report. It also focuses on evidence for the conclusions that Stop & Shop was a price leader in the market power game and that Garelick and private label demand are sufficiently inelastic to support a leadership role for Suiza Foods Inc.

Before moving directly to the Report, let us briefly look more generally at the issue of farm-to-retail price transmission in milk markets. Figure 1 displays the retail price and the farm level price for the San Francisco market area. Note how fluctuation in the farm level price is transmitted forward to fluctuation in the retail price in a fairly regular and consistent fashion. This is a textbook example of how farm prices in a competitive channel affect retail prices.

Moving now to Figure 2, it shows the same type of data for the Seattle, Washington market area. Note in this chart, especially during the latter part of the period, that fluctuations in farm price are not transmitted forward to produce similar fluctuations in the retail price. In fact across the 1996 to 2000 period tracked in this chart one sees that the farm-to-retail marketing margin widens substantially. One also sees that retail prices tend to accelerate up when farm prices rise, but when farm prices fall back retail prices do not fall back in a similar and commensurate fashion. This is an example asymmetric price transmission in a marketing channel.

One is hard pressed to conclude that the pricing by processors and retailers in the Seattle market is in fact competitive. It certainly seems that over time retailers and/or processors have been able to widen the margin thereby increasing their profit rates. To demonstrate this rigorously one needs to control for increases in other marketing inputs such as labor, electricity, and diesel fuel at the processing and retailing stages of the marketing channel. However, given the very significant widening of the margin and common knowledge of

market cost increases during 1996-2000, it is very unlikely that increases in other input costs are responsible for all of this widening of the margin.

So the question now as we move to our report and New England is how do the farm and retail prices relate in the Boston market and how did that price relationship change at the Compact implementation in July 1997? Specifically we are interested in determining whether price transmission in the Boston market is more similar to the San Francisco or the Seattle case. To deconstruct the Boston market results we are going to start simply with the retail price and the farm price one month prior to the implementation of the Dairy Compact. Figure 3 shows the retail price for the 4 week period ending June 22, 1997 in Boston. It was $2.42/gallon. We call this the before Compact retail price. The price that processors paid for raw milk for fluid processing in that same 4 week period was $1.27/gallon. We call this the before Compact farm price. Moving to the next figure, Figure 4, Compact implementation occurred in early July 1997 and increased the farm price to $1.46/gallon. This amounted to 19 cents per gallon price increase in our data from $1.27 to $1.46.

The critical question is how much will the retail price increase? If all we have to go on are these before Compact prices of $1.27 at farm level and $2.42 at the retail level and the fact that farm price goes up 19 cents, then it seems reasonable that the retail price would also go up 19 cents. This in fact is the contention of the industry. At the time of Compact implementation they said that if the Compact increased the price 19 cents per gallon they would increase the retail price 19 cents.

But look at the next chart, Figure 5. Given the information in this new chart a 19 cent price increase is not what we would expect because it is not consistent with industry price conduct. In this chart we have information on the retail and the farm price for 18 periods prior to the Compact. Notice first of all that there is no relationship between the farm and the retail price. Farm price over this period escalates to $1.60/gallon and then crashes to approximately $1.30/gallon and bumbles along at a relatively low level hitting the lowest price in the entire period in the month immediately prior to Compact implementation. This is the $1.27/gallon price that we saw earlier. Virtually none of the roller coaster path in the farm price has been transmitted forward to the retail price level. The retail price in Boston trends slowly and steadily upwards from approximately $2.35/gallon to the $2.42/gallon price that we saw in our prior figure for June 1997.

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With this information would you predict that an increase in the farm price is going to cause an increase in the retail price? Would you in fact predict that if you increased the farm price 19 cents per gallon from this very low price, in fact the lowest price in the prior 18 periods, that retail price would increase 19 cents per gallon? The answer based upon these data is clearly no. The way retailers priced prior to the Compact strongly supports the conclusion that changes in the farm price would not be transmitted forward on a penny-per- penny basis to the retail price.

Moving to Figure 6, the results of a statistical analysis relating the farm to the retail price indicate clearly that the best predictor of the retail price in this before Compact period is the average farm price, which was $1.40/gallon. This fact leads us to conclude that one cannot explain pricing conduct in this market by using a traditional farm-to-retail price transmission model, a model that relates current farm prices to current retail prices.

Economists of all persuasions generally agree that firms maximize profits. This assumption is the foundation for economic analysis of supply side conduct in markets. The farm and retail price trends in Figure 6 are not consistent with profit maximization if market channel firms base current retail price upon the current farm price or farm prices from recent months. If firms were maximizing profits in this fashion retail prices would respond to changes in farm prices. In Figure 6 and our statistical analysis, they do not. Therefore we need a different theory of the firm to link observed price conduct to profit maximization.

The model that one needs to use for a profit maximizing firm given the observed price relationships in this market is in fact a model of market channel firms facing a risky input price for raw milk. These data are consistent with profit maximization by firms facing a risky milk input price. As an important aside we would note that the U.S. Congress when passing the Dairy Compact law clearly recognized that the correct model for analyzing pricing in the dairy marketing channel was a model with a risky and volatile farm milk price. In fact one of the very fundamental purposes of the Dairy Compact law was to stabilize the farm price. In addition to stabilizing price it also authorized increases in the price. The Dairy Compact law maintained that both the stabilization and the increase in the farm level price would enhance dairy income and stabilization would benefit marketing channel firms.

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The classic model of profit maximization with risky input price is the mean-variance approach. In a mean-variance model firms summarize a random variable such as the raw milk price by using its average value, in this case a $1.40/gallon, and its variance. The variance of random variable summarizes how much actual prices fluctuate about the mean value, in this case the $1.40 average price.

Using the mean-variance approach to profit maximization with a risky input price we can now analyze the impact of the Dairy Compact upon the market channel. In Figure 7 we have the before Compact average farm price at $1.40/gallon. The post-Compact average farm price increased to a $1.46/gallon. This post-Compact price in fact remains constant at a $1.46/gallon for 15 four-week periods post-Compact implementation. Processors knew at Dairy Compact implementation that the price that they would pay for raw fluid milk would remain constant at the Compact minimum for several months into the future. From this fact we can conclude in the mean-variance model that processors and retailers knew that the average price of raw milk was going to go up 6 cents per gallon. Moreover, processors knew that for the foreseeable future the variance of their risky input price was going to go to zero. Variance goes to zero because the Dairy Compact effectively stabilized the price for 15 months post-Compact implementation at a $1.46/gallon.

Given this change in the pricing patterns in the raw milk market, one can now use the profit maximization model with a risky input to predict exactly what the retail price increase should be. First, if the average cost to the firms went up 6 cents per gallon as in Figure 7, one would expect that the retail price would have increased from $2.42 to $2.48 post-Compact to cover the increase in the average milk price at the farm level. Equally important, since the variance in the risky input price was reduced from a high relatively level to zero, market channel firms enjoy a cost savings. Channel firms no longer have to be compensated for bearing price risk. Channel firms can now avoid hedging costs or other costs necessary to reduce risk in their key input market. This means that the margin between the retail and the farm price should actually go up less than 6 cents per gallon. In our report we do not estimate the risk premium nor do we adjust the raw milk cost increase due to the Compact down from the 6 cents per gallon that we see in this chart to account for the reduction in price risk that market channel firms enjoy.

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We conclude, based upon the model of a profit maximizing firm with a risky input price, that retail prices should have gone up at most 6 cents per gallon, increasing from $2.42/gallon to $2.48/gallon post-Compact implementation. In fact we can see in Figure 7 that the retail price went up not to $2.48/gallon but to $2.61/gallon. [1] The 19 cents increase in the retail price which corresponds to the 19 cents per gallon increase in the farm price from June to July in 1997 in fact is a larger increase than is needed to protect the profit levels of the marketing channel firms. A 6 cent per gallon increase was more than sufficient to ensure the same level of profits in the post-Compact period that these firms enjoyed in the before Compact period.

The only assumption necessary for this general economic analysis is the assumption that firms maximize profits.   Since economist's of all persuasions, and especially conservative, free-market Chicago School economists, accept this assumption as the foundation for supply side economic analysis of markets, our conclusions are robust.

Shifting to Figure 8 we come to a very important result. Market channel firms used the Compact farm price increase as a vehicle to lock in higher marketing margins. Before the Compact the average marketing margin for milk in the Boston market was 98 cents per gallon. In the 15 periods after the Compact when the farm price was flat at $1.46/gallon, the marketing margin increased to a $1.10/gallon. This is simply statistical confirmation of what we proved earlier. Market channel firms only needed to increase the price 6 cents per gallon during the post-Compact period to preserve their 98 cents per gallon before Compact marketing margin. In fact they increased the price 19 cents per gallon at Compact implementation. As shown in Figure 8, during the 15 post-Compact periods, the average margin increased 12 cents per gallon. What this means is that unless other costs that the marketing channel firms incurred such as labor, electricity, and fuel increased by 12 cents per gallon during this period, bottom-line profits increased after the Compact. In our study we in fact show that increases in these other costs are not sufficient to explain the widening of the margin that occurred at Compact implementation.

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[1] This is the retail price for the second period post-Compact Implementation because the prior period in the IRI data did not clearly capture the Compact event (see Figure 9).

To date in the debate over the impact of the Compact all of this increase in retail prices at Compact implementation has been attributed to the farm program when in fact a significant portion of it was due to the margin-widening behavior of market channel firms. These firms increased their bottom-line profits and attributed their underlying price increases to the Compact and increased dairy farmer income.

Shifting now to Figure 9 one has Figure 1 from our report. We hope that this PowerPoint® deconstruction of the increase in farm price that occurred at Compact implementation has been helpful to you. Specifically we hope that one can now understand that the jagged jump in the farm price to the stabilized $1.46/gallon in Figure 9 is not justification for increasing the retail price 19 cents per gallon. That retail price increase is also observable in Figure 9.

Before moving on we also ask you to note that in the Boston market when the farm price moved above the Compact minimum price floor in 1998 and again in 1999 retail prices did respond to this increase in the farm price, however retail prices did not come back down in a commensurate fashion when farm price collapsed back to the Compact minimum price floor. This leads us to conclude that retail milk pricing in Boston during the 1998-2000 period is clearly more similar to retail pricing in Seattle than San Francisco. In conjunction with the tacitly collusive price move in 1997 around Compact implementation, the 1998-2000 pricing of milk in Boston establishes that market channel firms have widened the farm-to-retail price spread in a non-competitive fashion during this time.

Moving to Figure 10 (Figure 17 in the Report) we document that increases in other market input costs were not sufficient to explain the widening of the margin in the Boston market. In Figure 10, note that we have drawn in a retail milk price trend line for the before Compact period to obtain a forecast before Compact price of $2.43 per gallon.[2] At Compact implementation we have allowed that forecast price to jump up 6 cents per gallon to represent the increase in the risky input price that is justified by the Compact action. After the Compact retail price increases along a trend line that allows for a 3 percent growth rate in the prices of other marketing inputs. As documented in our report, a 3 percent growth rate through 1996-2000 period in Boston is

a very credible and reasonable estimate of the actual increase incurred by processors and retailers in the prices of inputs other than milk. One can thus see that immediately post-Compact implementation retail prices increased by more than was needed to cover the 6 cents per gallon increase in raw milk plus the growth rate in prices of other inputs. By late1998, however, retail prices were not appreciably above the forecast price trend line.

During the latter half of 1997 and during 1998 some deviations from the tacitly collusive price move at Compact did occur in the Boston market. In our study we document that the firms who sought to chisel on this high price were Shaws and DeMoulas at retail and the Hood and Guida-Seibert milk companies at wholesale. Firms that particularly sought to establish and maintain the high retail prices consensus throughout this period were the Stop & Shop company and Hannaford, Shop-n-Save. At the processor level, most probably the Suiza Garelick processing company, also led the move to higher milk prices.

When estimating the amount that retail prices were elevated over and above the cost incurred by the processors and retailers we adjusted our forecast retail price trend line by the increase in raw milk prices above the Compact minimum in 1998 and again in 1999. Effectively we allow processors and retailers to pass on entirely the increase in the raw milk price that occurred during these two raw milk price spike periods. However, even when allowing for full pass through of these price spikes one still finds that retail prices were elevated substantially above the level needed to cover the increase in milk costs due to implementing the Compact minimum price floor, costs of the milk price spikes, and the increase in costs of other inputs.

Shifting now to Table 1 (Table 14 from our report), we document who gained from the retail milk price hikes during the full 3-year period from July 1997 to July 2000. Table 1 contains a summary for all of New England and then breaks out the analysis for each of the 4 major Information Resources Inc. (IRI) market areas in the New England area: Boston, Hartford-Springfield, Providence and northern New England. First, let us just examine in the results for all of New England.

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[2] According to the General Accounting Office this forecast price is a more accurate indicator of the before Compact retail price. It is only a penny above the actual June 1997 retail price, $2.42 per gallon. Since this penny reduces our market power overcharges we use this forecast price to be conservative in our consumer damage estimation.

One can note in Table 1 that the average farm price before the Compact is a $1.40/gallon as we have said before. The average farm price during the 3 years of our post-Compact period increases to $1.51/gallon. This is an 11 cent increase in the average cost of milk in the after period as compared to the before period. In Table 1 we decompose this 11 cent per gallon increase into the increase due to the Dairy Compact, which was only 4.5 cents per gallon, and the increase due to strong raw milk markets during the price spike periods, which is the remaining 6.5 cents per gallon. We need to explain that although the Compact increased the price of milk 6 cents per gallon, the Compact's minimum price floor was in effect for only 30 of the 40 periods during the post-Compact period. During the other 10 periods raw milk prices were above Compact and the Compact had no effect on raw milk prices. Thus the average impact of the Compact over the 3 years after its implementation is not 6 cents per gallon. It is 6 cents per gallon for three fourths of the time period. This means that one gets only a 4.5 cent average price increase due to the Compact during the 3 year period.

The increase in retail milk price due to non-milk inputs during the 3 year period averages 7 cents per gallon. This gives a total cost increase 18 cents per gallon during the 3 years after the Compact. Retail price, however, increased from $2.49 per gallon in all New England just immediately prior to the implementation of the Compact to $2.78, which is the average price during the 3 years post-Compact implementation. Thus for all of New England the retail price increased 29 cents per gallon when costs increased only 18 cents per gallon. One has an 11 cents per gallon increase in the profit margin, net of all costs, for the market channel firms. When aggregated across all the milk sold during post-Compact period this 11 cents per gallon increase constitutes a 49.4 million-dollar charge to consumers due to increased profits by channel firms. By comparison the Dairy Compact's increase of 4.5 cents per gallon increased consumer's milk bill only 19 million dollars.

If one looks at the individual market areas in Table 1 we see that for the Boston market area the Compact increased the price across the 3-year period on average 4.5 cents per. The raw milk market doesn't change from one market area to the next in New England because it is New England wide. We find that the retail price increased from $2.43 cents per gallon just prior to the Compact $2.73 cents per gallon in the 3-year average period after the Compact. This is a 30 cents per gallon increase. The increase in profits by market channel firms in Boston is 13 cents per gallon.

For Hartford-Springfield the increase in market channel profits is 15 cents per gallon. It also is 15 cents per gallon for Providence. As we will see below, Stop & Shop was the retail price leader in these markets. The increase in profits by market channel firms in Northern New England was the lowest of the four markets, only 7 cents per gallon.

Shifting now to Figure 11 we have drawn in the Federal Market Order Class I price during the post-Compact period. We have done this to illustrate the difference between our before and after analysis of the impact of the Dairy Compact on consumers and the common analysis that dairy farmers have seen of the impact of the Compact on them. In our before and after analysis the Compact's benefit for dairy farmers from the sale of milk in supermarkets was only 6 cents per gallon during the 30 periods when the Compact minimum was in effect. On average, this was 4.5 cents per gallon across the 3 year period. This benefit totaled $19 million dollars for farmers. Elsewhere agricultural economists, and especially the Dairy Compact Commission have shown that the Dairy Compact benefits to farmers are in excess of $100 million dollars.

Using our data in fact one can show that the Dairy Compact benefits to farmers include not only the 19 million dollar increase that supermarket consumers paid to dairy farmers, it also includes consumer payments from other channels of distribution and the benefits that dairy farmers gain from avoiding the drop in the class I price during the post-Compact period. This is the price floor feature of the Dairy Compact. Using Figure 11 one can see that in fact during the post-Compact period, farm prices at a $1.46/gallon were far better than what they would have been if there was no Dairy Compact. Absent the Dairy Compact, farmers would have received the Federal Market Order Class I price during this period. The benefit to farmers due to the minimum price floor added millions to farm income.

One can conclude, as agricultural economists and Dairy Compact Commission have concluded, that the Dairy Compact increased farm income $128.5 million dollars during this 3 year period. Of that $128.5 million dollars, we estimate that $19 million dollars came from increased prices in supermarkets to cover the Compact mandated increase in raw milk prices. Some of the other $109.5 million may have come from the impact of Compact-induced higher raw milk prices in milk distribution channels other than supermarkets. Our study focuses only on the supermarket channel. Since supermarkets account for roughly 40 per cent of all fluid milk

sales, dairy farmers benefits from the supermarket channel are 40 percent of $128 million, $51.5 million. Given the $19 million of the $51 million came from supermarket shoppers, $32 million comes from the Compact's price floor provision.

Some observers might at this junction cry fowl and claim that if in fact the Compact had not existed, supermarket shoppers would have also captured this 31.5 million dollars via lower retail prices. But this is logically inconsistent with observed market channel firm price conduct. Note in Figure 6 that in the before Compact period, no fluctuations in the farm level price were passed forward in any fashion to retail, therefore one cannot assert that low Federal Market Order class I farm raw milk prices during the post-Compact period would have been passed forward to consumers in the form of lower retail prices. This is precisely what the U.S. Congress hypothesized when passing the Dairy Compact legislation. They believed that the Dairy Compact legislation could and would transfer income to farmers from the market channel firms. They also believed that this transfer would be far more important than the transfer of income from consumers to farmers. This in fact has been the case.

We would also note and strongly stress that this transfer of income from processors and retailers to farmers during the post-Compact period did not come at the expense of profits by these market channel firms. This analysis protects and preserves the before Compact profit margins of market channels firms. What the Dairy Compact legislation does is prevent the market channel firms from capturing a windfall profit gain at the expense of dairy farmers due to volatile and low raw milk market prices.

The next set of Figures illustrates in graphic detail the difference between farmer benefits after versus before the program and farm benefits due to avoiding the lower raw milk price during the post-Compact period. The after period is only the 30 periods between July 1997 and July 2000 when the Compact minimum was in effect. Figure 12 shows the farmer benefits from the 6 cents per gallon increase in the price of milk in the after period compared to the before period. Figure 13 shows that during the post-Compact period when the Compact price minimum was in effect farmers received a $1.46/gallon and if the program had not been in place farmers would have received on average $1.33/gallon. This constitutes a 13 cents per gallon increase in the average farm price over the 30 four week periods after the Compact when its price floor provision was in effect.

Now lets shift to an entirely different topic, the documentation in the report for the assertion that Stop & Shop used its dominant market position to elevate retail prices in southern New England. Figure 14 is Figure A2 from the underlying report. It gives price trend lines for Stop & Shop supermarket chains in the Hartford-Springfield market area. This IRI market area includes all of Connecticut except for Fairfield and Windham counties, and it includes much of western Massachusetts all the way to the Vermont border.

We stress two facts related to this chart. First note that in late 1996, Stop & Shop milk prices, which before had been effectively the same as all other supermarkets, clearly and decisively move above the prices of all other supermarkets. This change in pricing strategy for milk at Stop & Shop occurred immediately after the acquisition of Stop & Shop by the Royal Ahold chain of the Netherlands and the conversion of many Edwards Supermarkets in this market area to Stop & Shop supermarkets.

Second, please note that in the two years after the implementation of the Dairy Compact Stop & Shop's retail milk prices remain essentially flat. During this period retail milk prices by other chains in the market area tend, however, to deviate in a downward fashion from Stop & Shop's high price line. Other supermarket chains challenged the price leadership of Stop & Shop during this period. However by May of 1998 they revert to the Stop & Shop price regime and re-establish the price level that occurred immediately post-Compact implementation. This price conduct pattern leads us to conclude that Stop & Shop was the price leader at Compact implementation because it sustained that level during the post-Compact period.

Shifting now to Figure 15, which is B2 in the Report, one has a similar price chart for the Providence market area. Again in early 1997, we have a shift in milk pricing behavior by Stop & Shop compared to all other chains. Prior to that period Stop & Shop's price tended to consistently be cheaper than other supermarket chains in that Providence area. However after the Royal Ahold acquisition of Stop & Shop and the conversion of some Edwards Supermarkets in the Providence market area to Stop & Shop supermarkets, Stop & Shop's retail prices move consistently above the prices of other supermarket chains for the next several years. Also note that, as in the Hartford-Springfield market area, Stop & Shop maintains high retail prices during the two years immediately after Compact implementation. The other supermarket chains in Providence attempted to chisel on these prices lowering price in 1997 and 1998.

By late 1999 or early 2000 the retail prices of other chains in Providence closed the gap and effectively are the same as Stop & Shop prices from November 1999 through the end of our data period July 2000. During the post-Compact period the major other change in Providence involved the Ro-Jacks supermarket chain. It more than doubled its size via the purchase of 6 divested Edwards or Stop N Shop stores in late 1996 at the time of the Royal Ahold acquisition of Stop & Shop. That divestiture was intended to create a stronger third competitor with roughly 7 percent of the Providence market. Future growth of Ro-Jacks would challenge Stop & Shop which has roughly half of the market. Shaws is the number two firms with about one quarter of the market. By late 1999 or early 2000 that marketing experiment had failed. Recently the Ro-Jacks chain was taken over by its supplier Super Valu. As the Ro-Jack's chain went under, it and Shaws appear to have elevated prices to Stop & Shop levels.

Lets now shift to another topic of interest for analysis of milk pricing in New England. A key question is was it profitable for the retail chains and possibly Suiza Foods Inc., the processor of Garelick and private label milk, to elevate prices as our analysis has shown. Table 1 documents that it was. There is a second way that we can address the profitability issue. In our report we use the price and quantity data at the brand level for the Boston market to actually estimate the retail demand curves for brands of milk. Once we have estimated these demand curves we can see whether they are sufficiently inelastic to insure that retail price increases would increase the profits of the firms that increase price.

Figure 16 (Figure 4 in the report) is the beginning of this analysis. It shows the brand level retail prices for the Boston market. The three brands that we have are Hood milk, which is the highest priced milk in the market, Garelick brand milk, and private label (supermarket- own-label) milk which is the lowest priced milk in the market.

First note that at Compact implementation all three brand prices jumped as we saw in the Boston aggregate data (Figure 9). Also note that the Hood prices tend to fall back towards pre-Compact levels. This is the basis for our conclusion that the Hood milk company tended not to cooperate in the tacit collusion that occurred during the two-year post-Compact period. Note also that in early 1999 the Garelick and private label prices tend to go up by more than the Hood prices thereby closing the price gap between the premium product

Hood and Garelick and private label. As we will see in our demand analysis this strong retail price elevation of Garelick and private label relative to Hood has an impact on market quantity sold.

We can also see this by looking at the next chart Figure 17 (Figure 14 in the report), which arrays over time the volume of private label Hood and Garelick milk sold in Boston. The volume of private label milk trends down, especially during the post-Compact period when private label prices were elevated relative to Hood milk. The same holds for Garelick milk. Garelick volume trends down especially in the post-Compact period when Garelick's price was elevated more than Hood price, thereby closing the brand gap between Garelick and Hood. Note also that during the post-Compact period the volume of Hood milk trends up clearly and there is a clear jump in Hood milk sold after the Compact when the Hood company chisels on the tacitly collusive pricing of milk that occurred at the implementation of the Compact. Hood milk also trends up from that higher level over the rest of the period as the brand price gap between its premium product and the other brands narrows.

The next chart, Figure 18 here and Figure 14 in the report, plots the price and quantity data for the Garelick brand of milk in Boston. Also we have used multiple linear regression to estimate the demand curve in this price quantity space. Note that as the price of Garelick milk went up the quantity sold went down. Our best estimate of the relationship is the regression line drawn in this chart. The prices prior to Compact implementation of Garelick tended to be around $2.50, which is in the extreme right lower corner of this chart. Post-Compact Garelick prices moved up to the $2.70 range and Garelick prices then jumped in the latter part of the period to over $3.00/gallon. Each of these price increases over time tended to reduce the quantity of Garelick milk that consumers bought from the Suiza/Garelick company. Using the demand elasticity from this estimated demand curve, we show in the report that the price elevation of Garelick that occurred during this period indeed was a profitable price move. In other words, observed price quantity behavior in this market support our conclusions as reported in Table 1 and elsewhere in our report that the increase in the price of Garelick milk during the post-Compact period was profitable for the retailers and/or the processor of Garelick milk. We find it hard to believe that all this price increase was enacted by retailers and that all of the increased

profits were captured by retailers. It seems unlikely that the Suiza/Garelick firm would have allowed the retailers to capture all of this increase in profits.

Figure 19 (Figure 15 in the report) shows a similar price quantity scatter plot for private label milk. In this chart we have estimated the demand curve for private label milk. The demand curve doesn't go squarely through the data set because the price of substitute milk also affects the quantity of private label milk sold. In this case that price would be the price of Hood milk, which is not shown on this chart. If one holds the price of that substitute milk constant then the best fitting demand curve is in fact the line that is drawn here. Again we find that retail price elevation of private label milk was profitable during the post-Compact period. Private label milk during the post-Compact period was supplied almost exclusively by Suiza to chains other than Stop & Shop which processed its own private label.

In our report we also provide a similar demand curve for Hood milk. In fact retail price elevation during the post-Compact period for Hood milk was also profitable. This retail demand analysis of the profitability of price elevation during the post-Compact period supports and confirms the before/after analysis that we presented in Table 1. This completes our PowerPoint® deconstruction of the report on milk pricing in New England that is titled "The Public Interest and Private Economic Power: A Case Study of the Northeast Dairy Compact".

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The Public Interest and Private Economic Power: A Case Study of the Northeast Dairy Compact

- ◆ A PowerPoint Deconstruction of the Report's Analysis of Farm and Retail Pricing

Table 1. Who Gained from the Retail Milk Price Hikes: July 1997 to July 2000

	Before the Compact	After the Compact	Change per gallon	
All New England				
1 Average Farm Price	$1.40	$1.51		0.11
Increase due to Compact			0.045	
Increase due to Strong Raw Milk Market			0.065	
2 Increase due to non Milk inputs				0.07
3 Total Cost Increase (1+2)				0.18
4 Retail Price	$2.49	$2.78		0.29
Increase in Profits (4-3)				0.11
Boston				
1 Average Farm Price	$1.40	$1.51		0.11
Increase due to Compact			0.045	
Increase due to Strong Raw Milk Market			0.065	
2 Increase due to non Milk inputs				0.06
3 Total Cost Increase (1+2)				0.17
4 Retail Price	$2.43	$2.73		0.30
Increase in Profits (4-3)				0.13

Hartford-Springfield

1 Average Farm Price	$1.40	$1.51	0.11
Increase due to Compact			0.045
Increase due to Strong Raw Milk Market			0.065
2 Increase due to non Milk inputs			0.08
3 Total Cost Increase (1+2)			0.19
4 Retail Price	$2.60	$2.94	0.34
Increase in Profits (4-3)			0.15

Providence

1 Average Farm Price	$1.40	$1.51	0.11
Increase due to Compact			0.045
Increase due to Strong Raw Milk Market			0.065
2 Increase due to non Milk inputs			0.07
3 Total Cost Increase (1+2)			0.18
4 Retail Price	$2.54	$2.87	0.33
Increase in Profits (4-3)			0.15

Northern New England

1 Average Farm Price	$1.40	$1.51	0.11
Increase due to Compact			0.045
Increase due to Strong Raw Milk Market			0.065
2 Increase due to non Milk inputs			0.06
3 Total Cost Increase (1+2)			0.17
4 Retail Price	$2.47	$2.71	0.24
Increase in Profits (4-3)			0.07

Figure 1. Retail vs Farm Level Milk Price, San Francisco
March 1996 - July 2000
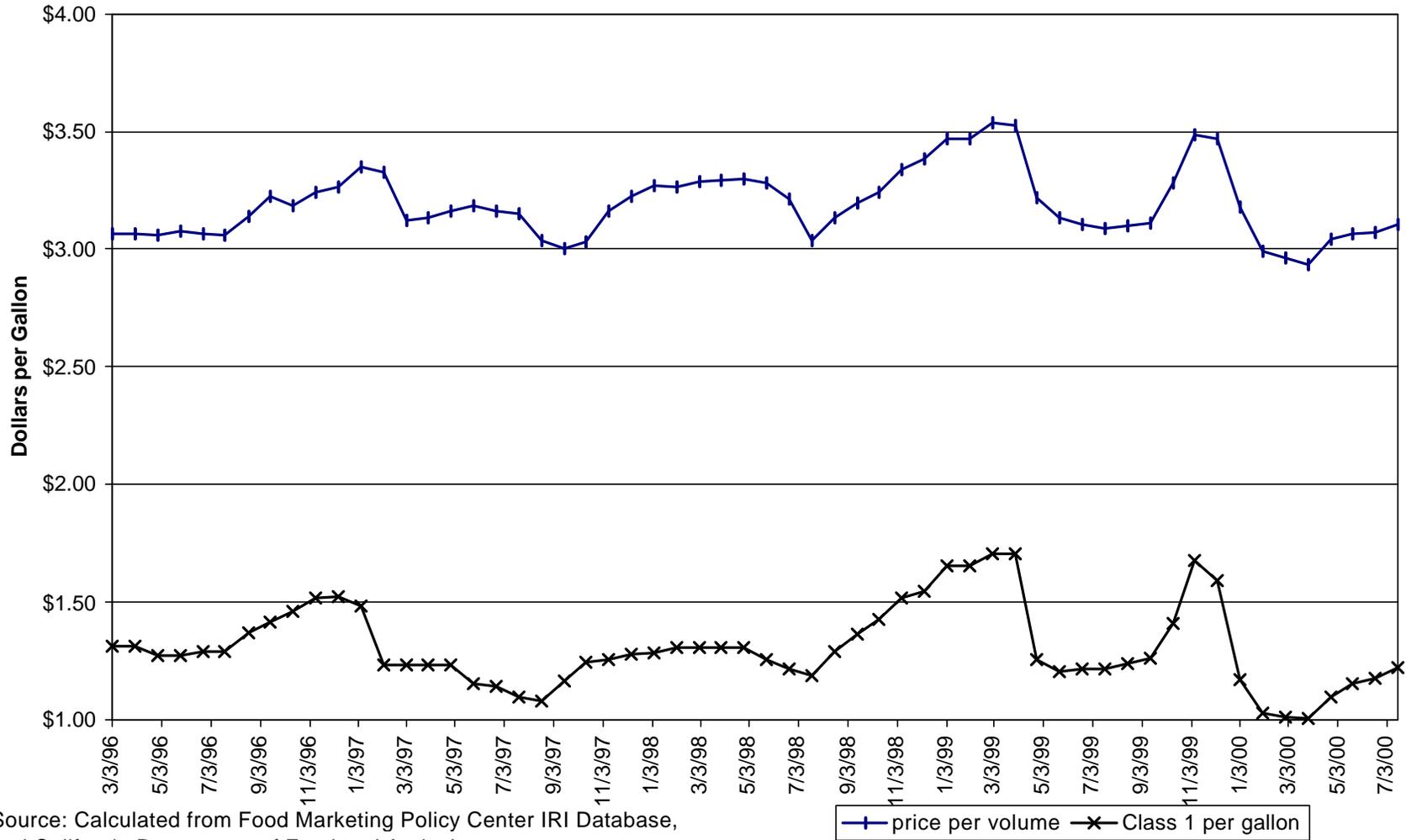
Source: Calculated from Food Marketing Policy Center IRI Database, and California Department of Food and Agriculture

Legend: price per volume — Class 1 per gallon

Figure 2. Retail vs Farm Level Milk Price, Seattle
March 1996 - July 2000
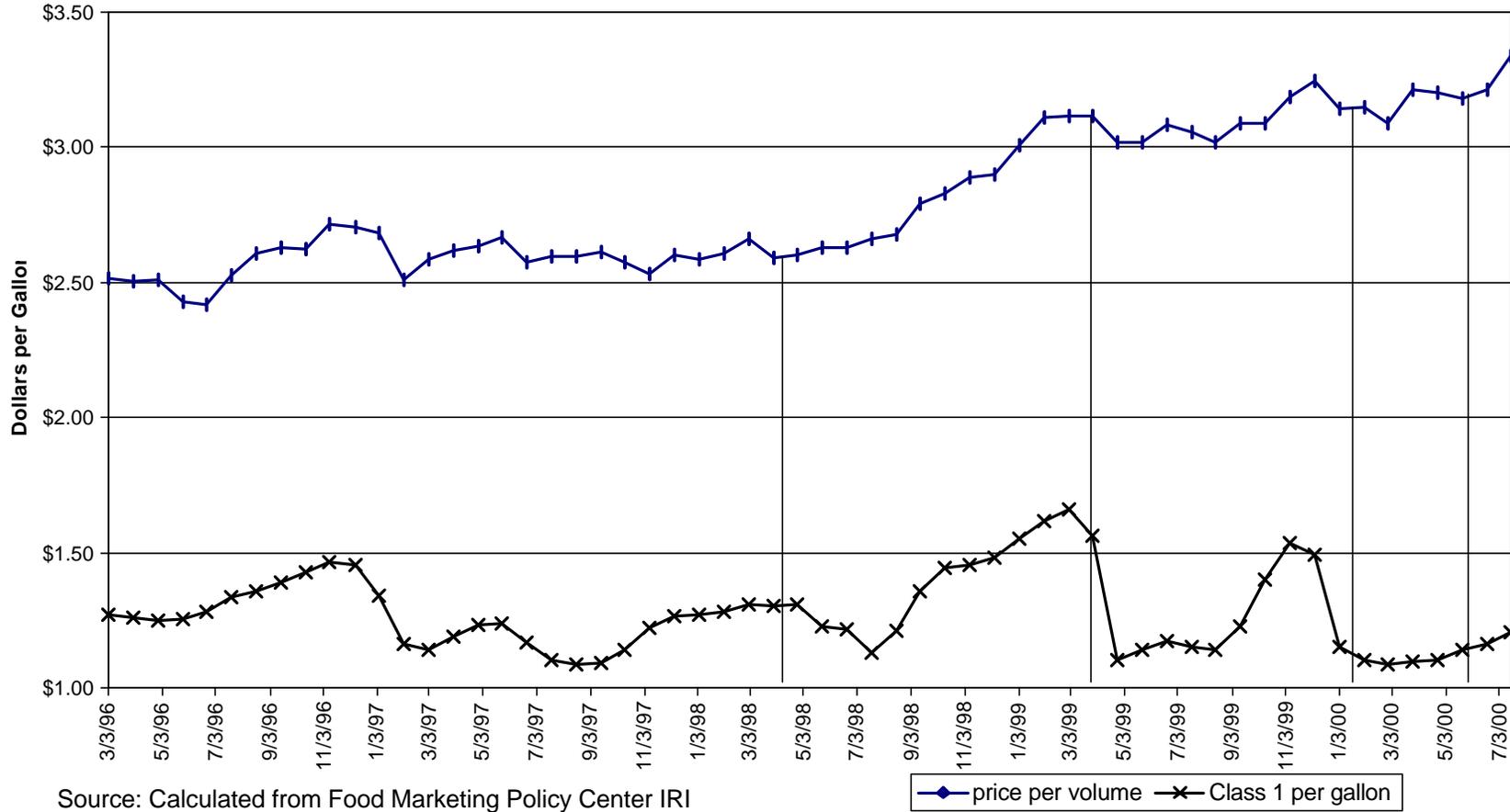
Source: Calculated from Food Marketing Policy Center IRI
Database,
and Agricultural Marketing Service, USDA
Vertical lines indicate press release events sited in the text.

Figure 3.

The Farm and Retail Prices
Before the Compact

$2.42 Before Compact Retail

*

$2.40 —

$1.27 Before Compact Farm

*

$1.20 —

6/22/9
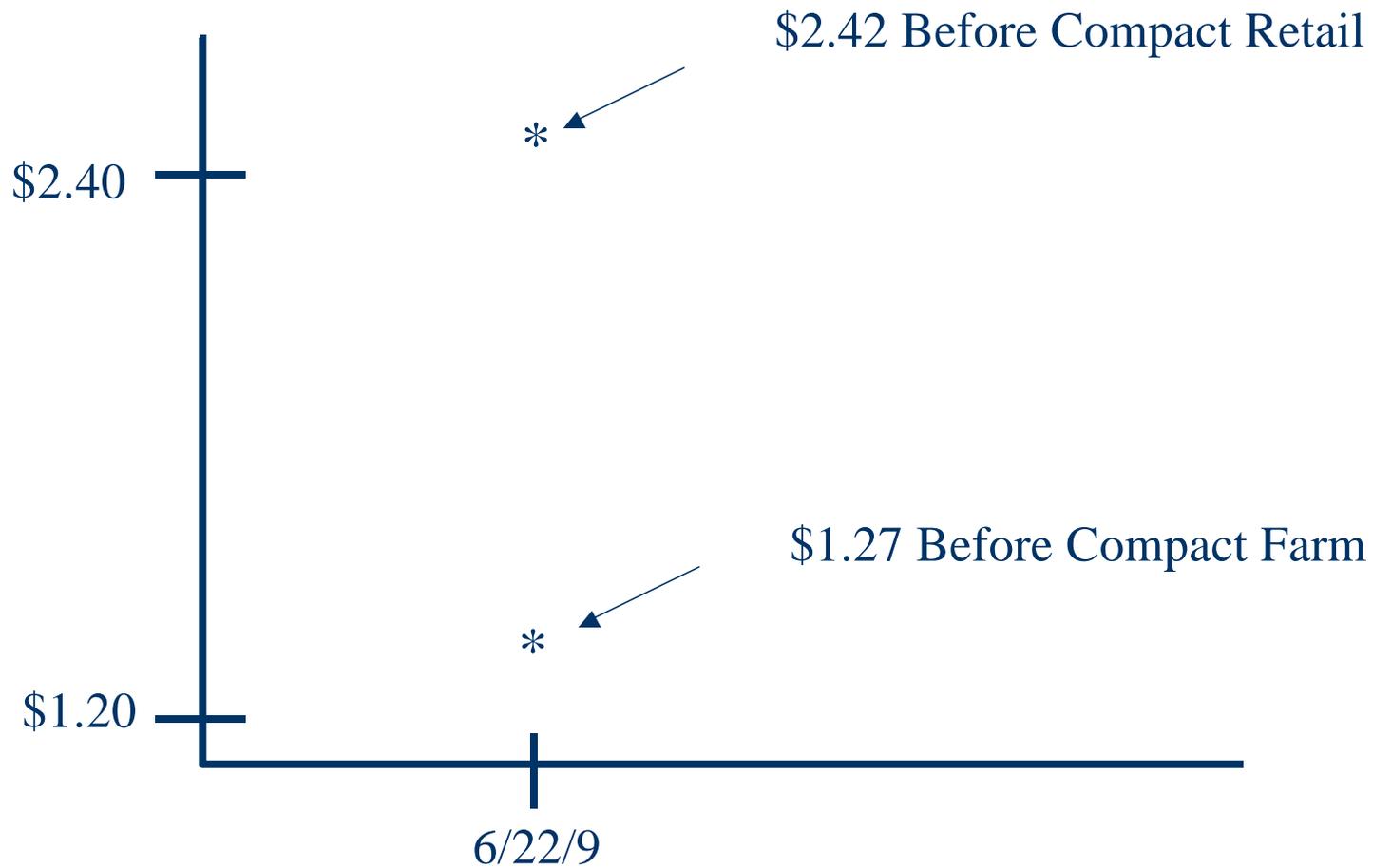
Figure 4.

The Farm and Retail Prices
After the Compact

Question: How much will retail price increase?

$*$

Answer: 19 Cents seems Reasonable

$2.40

$*$ $1.46 After Compact Farm Price
19 cent increase at Compact Implementation

$*$

$1.20

6/22/9   7/20/9
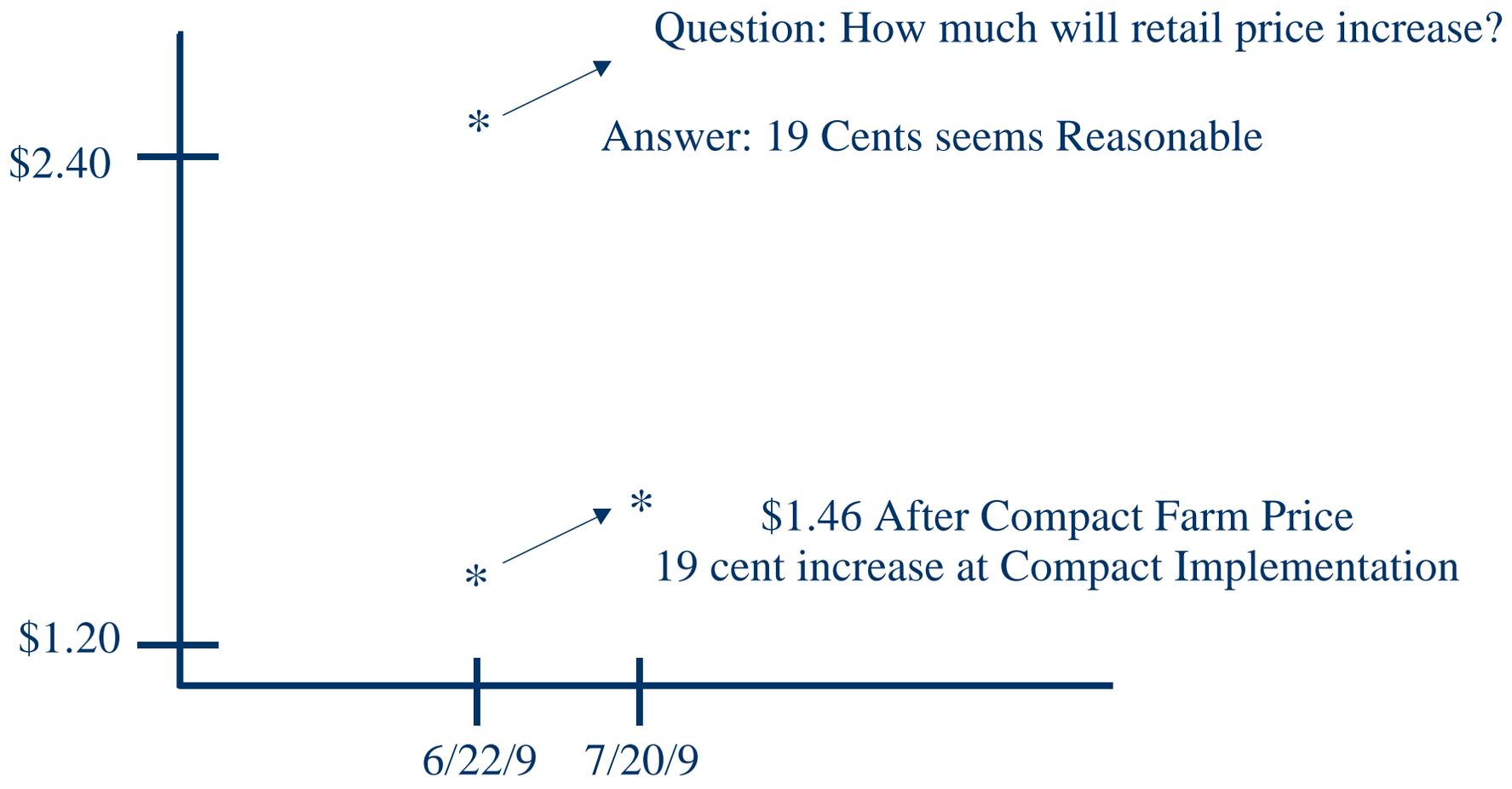
Figure 5.

But Look: Given This Information,
a 19 Cent Price Increase
Is Not What We Would Expect.
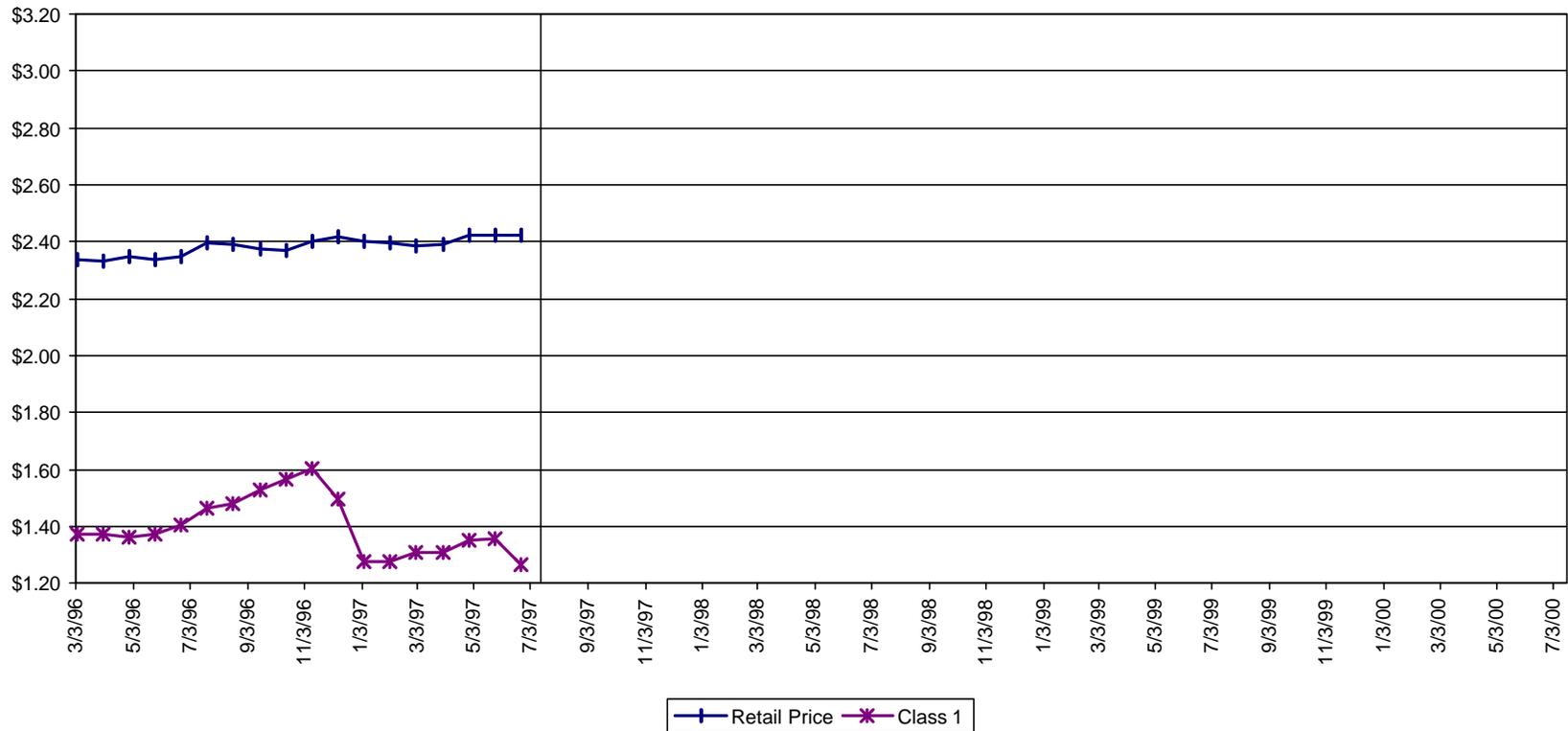
Figure 6.

Fact: The Average Farm Price $1.40/gal. Is a Better Predictor of Retail Price Than Is the Actual Farm Price. Retailers Do Not Respond to Variations in the Farm Price About the Average.
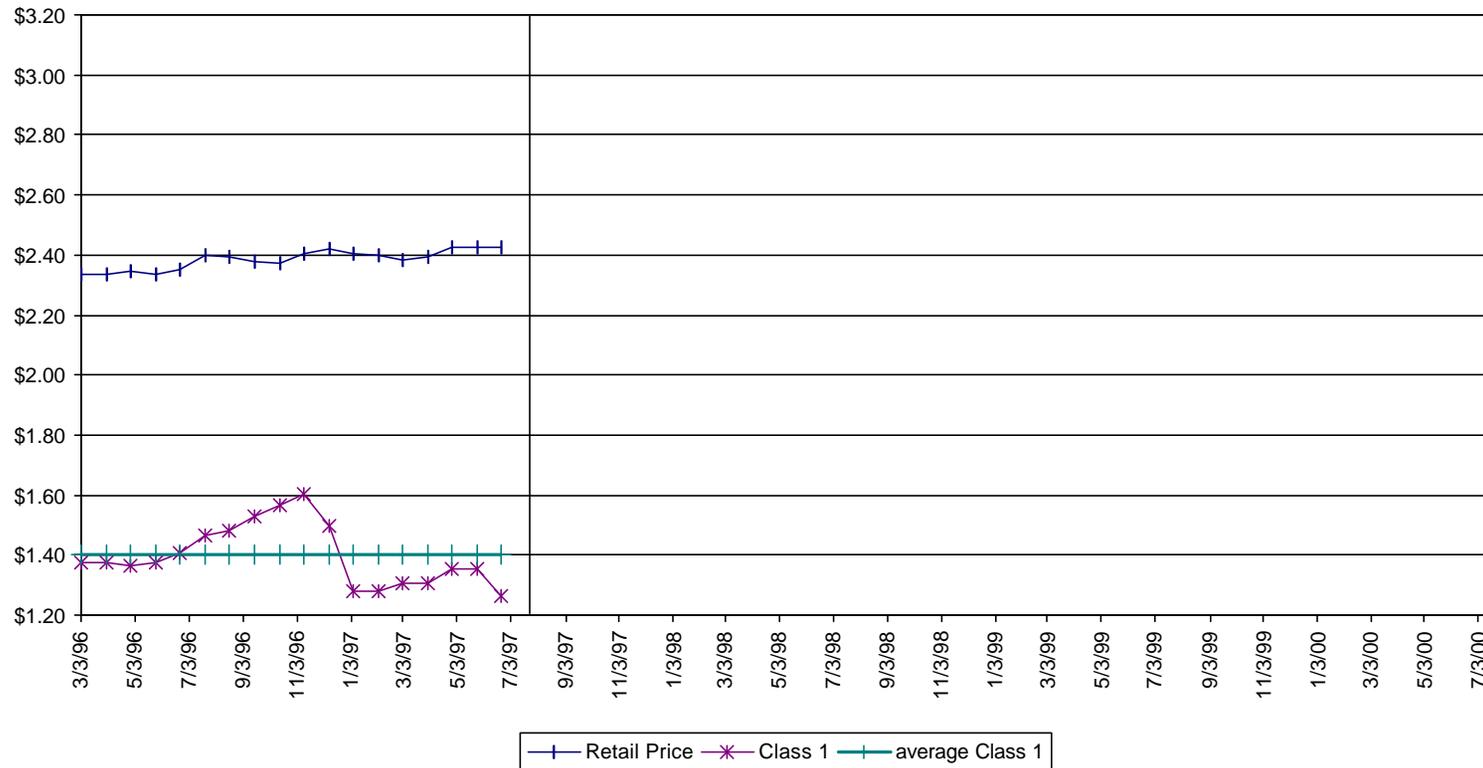
Figure 7. Post-Compact Farm and Retail Price Changes

Before Compact
Retail Price
$2.42

$2.61-Post-Compact Retail Price

$2.48-Post-Compact Retail Price
To cover average milk price increase.

$2.40

Before Compact
Average Farm Price

$1.46-Post-Compact
Farm Price

$1.40

7/20/97
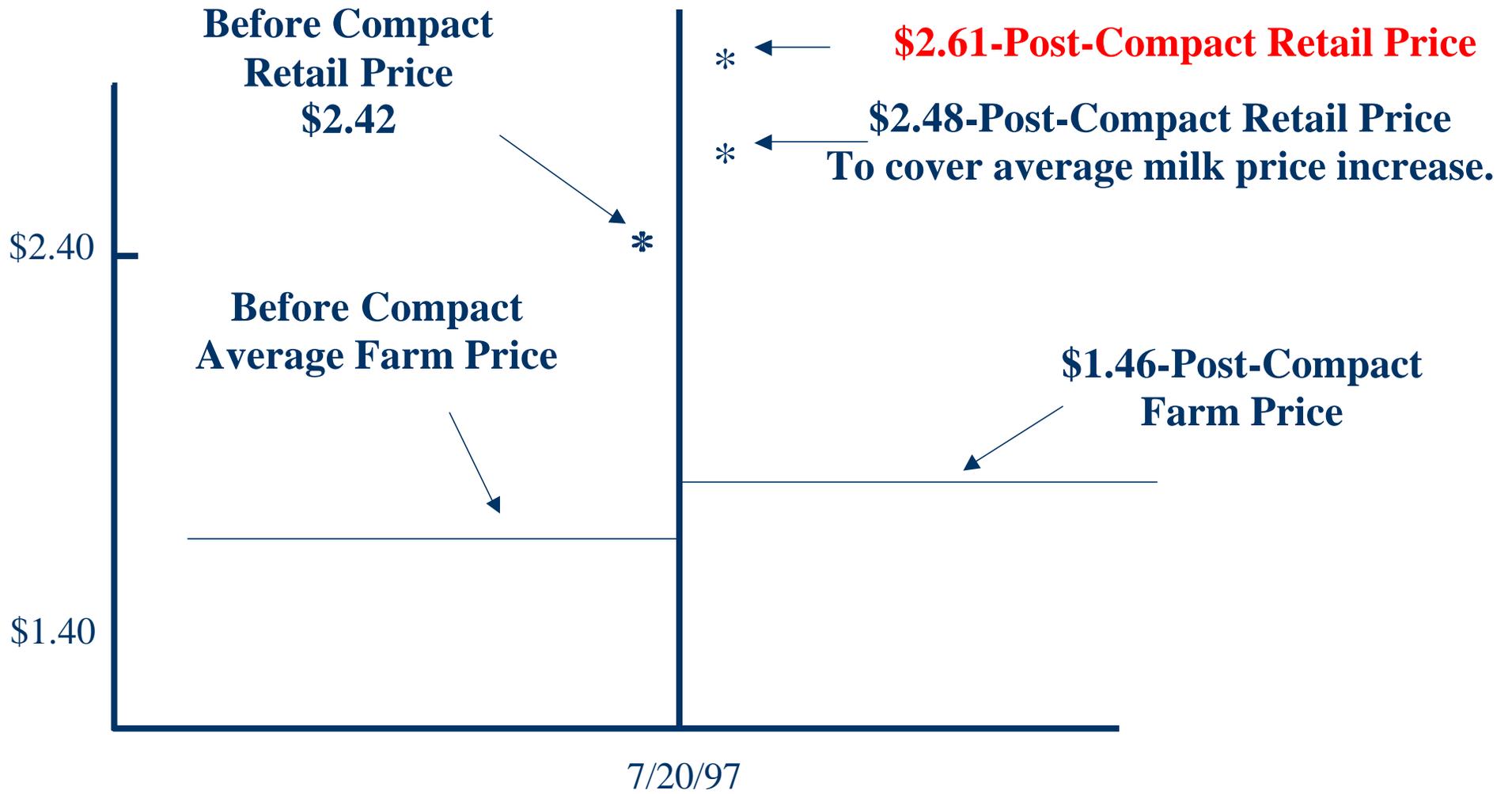
Figure 8.

Result: Firms Used the Compact Farm Price Increase As a Vehicle to Lock in Higher Marketing Margins

After Compact Marketing Margin Spread $1.10 (15 Periods Where Farm Price Is flat at $1.46/gallon).

Before Compact Average Marketing Margin 98 cents

$1.00

7/20/97
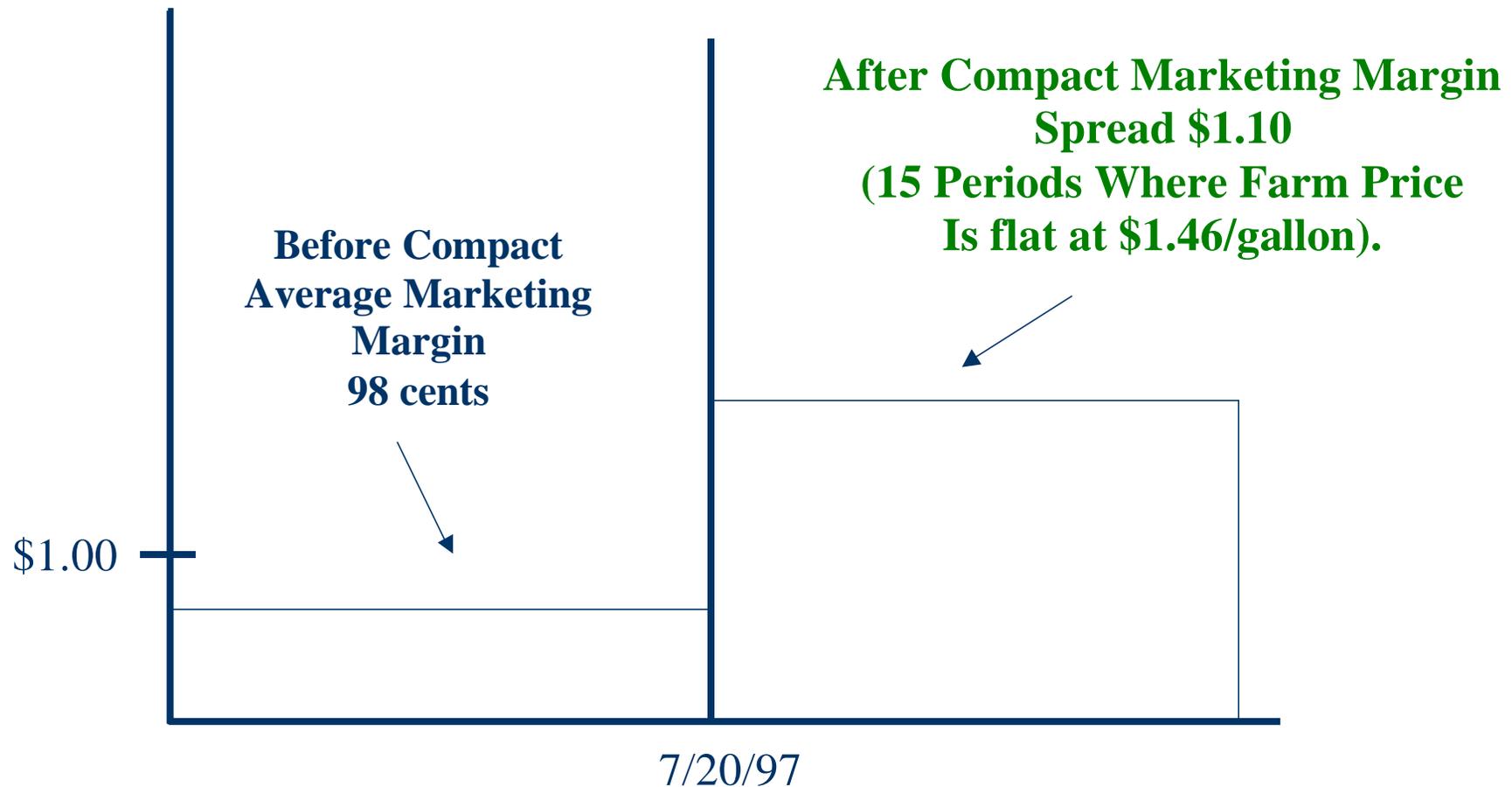
Figure 9

**Boston
Market Level Retail and Farm Fluid Milk Price
March 1996-July 2000**
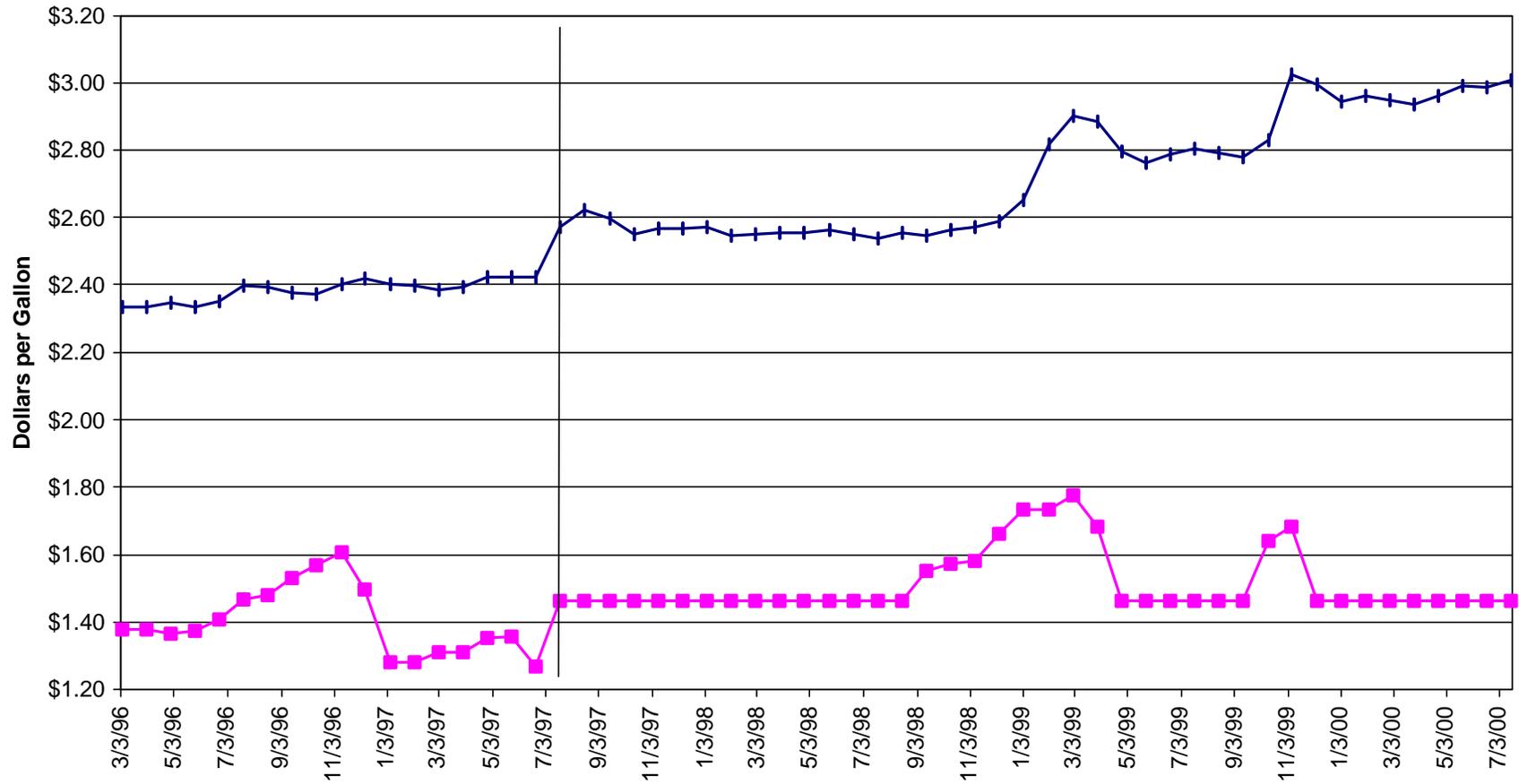
Source: Calculated from Food Marketing Policy Center IRI Database,
Federal Order #1 Administrator, NE Dairy Compact Commission

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Figure 10.

Boston
Market Level Retail, Farm Fluid Milk Price and Trend Price* after July 1997
March 1996 - July 2000
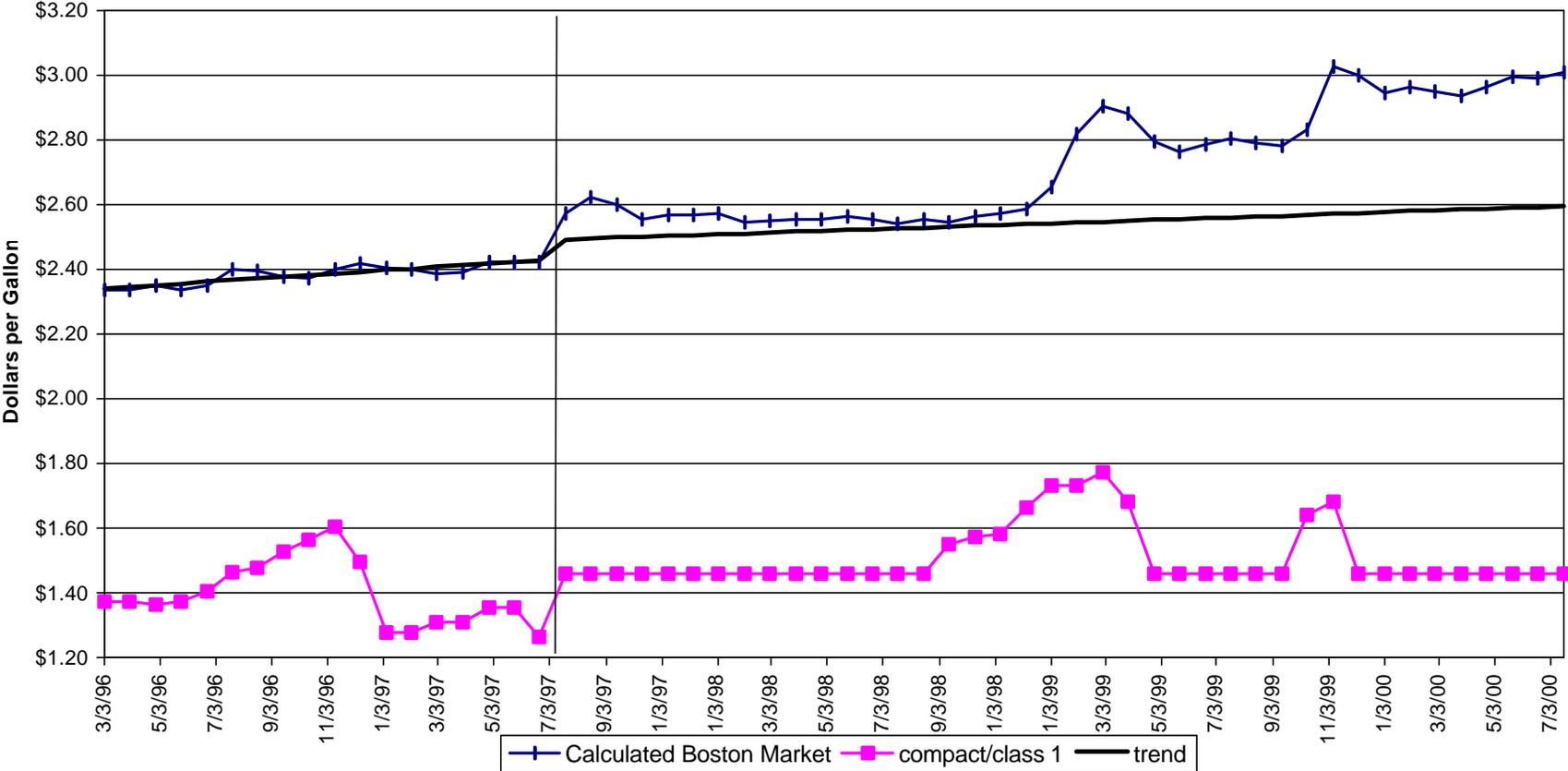
Source: Calculated from Food Marketing Policy Center IRI Database, Federal Order #1 Administrator,
NE Dairy Compact Commission
*6 cent compact premium plus 3% cost inflator

Figure 11.

Boston
Market Level Retail, Trend, and Farm Fluid Price
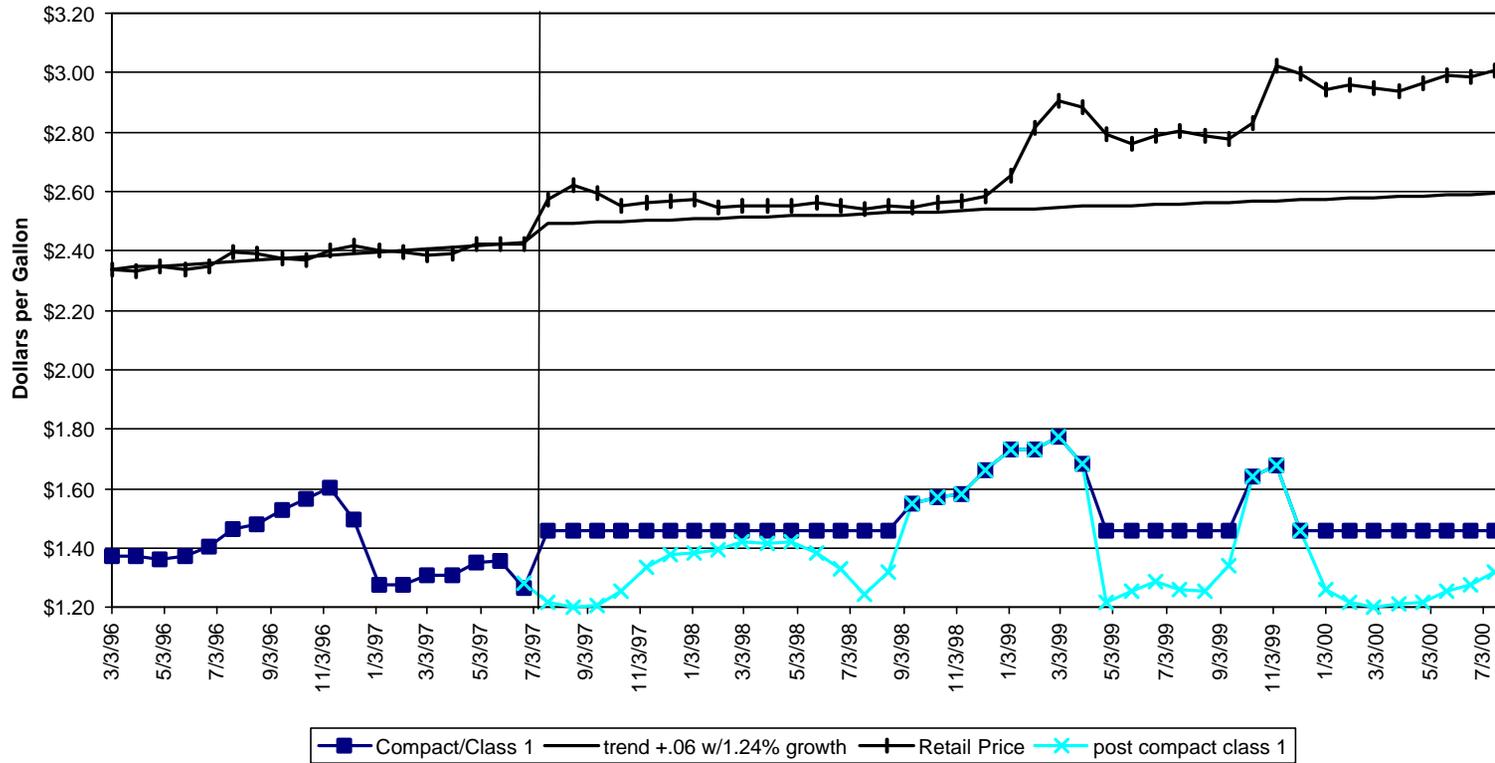
Figure 12.

Farmer Benefits: After vs. Before = + 6 cents
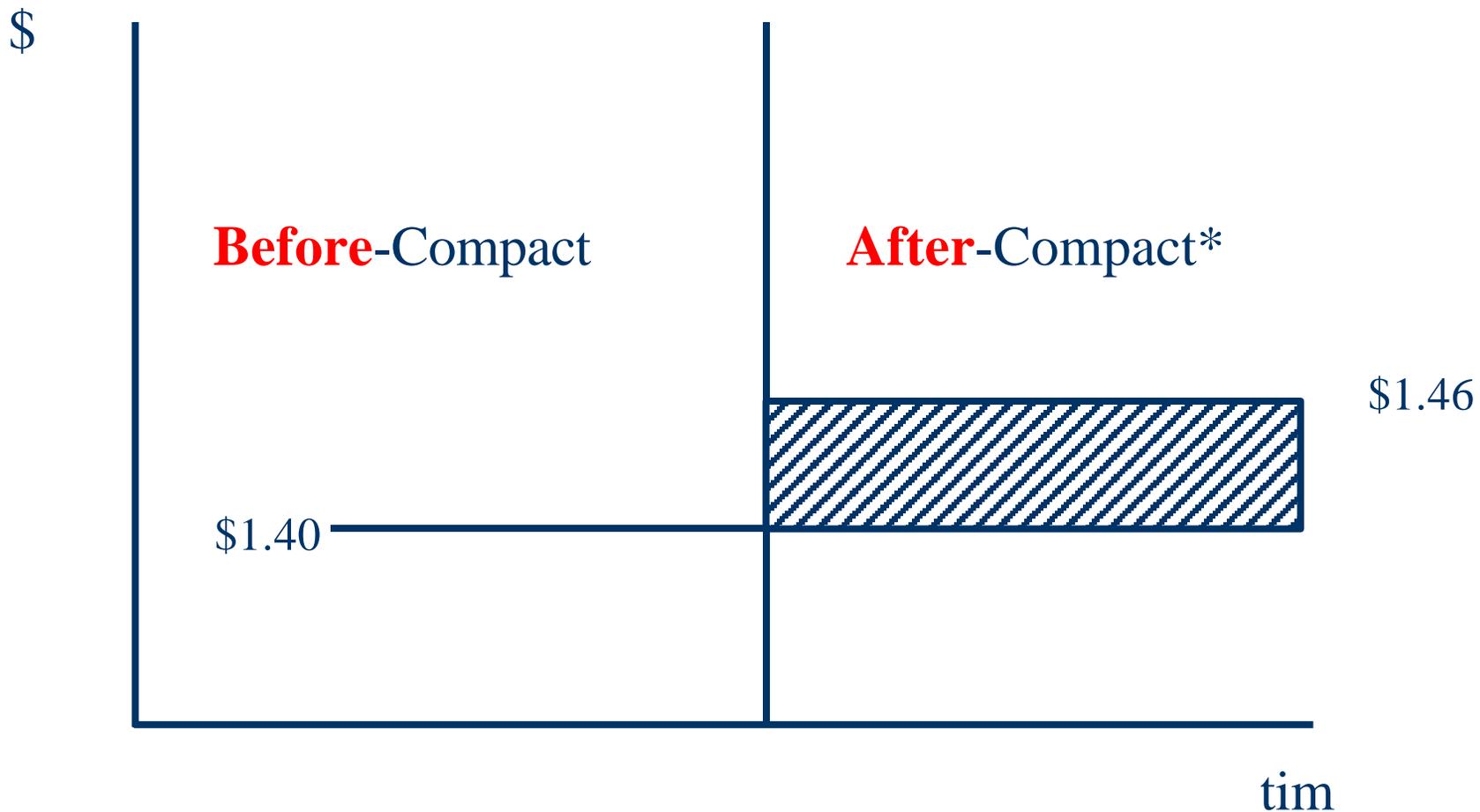
$

Before-Compact

After-Compact*

$1.46

$1.40

tim

*Includes only 30 (out of 40) four week periods when the Dairy Compact price floor at $1.46/gal. was operative.

Figure. 13

Farmer Benefits: After vs. What Would Have Been = + 13 cents
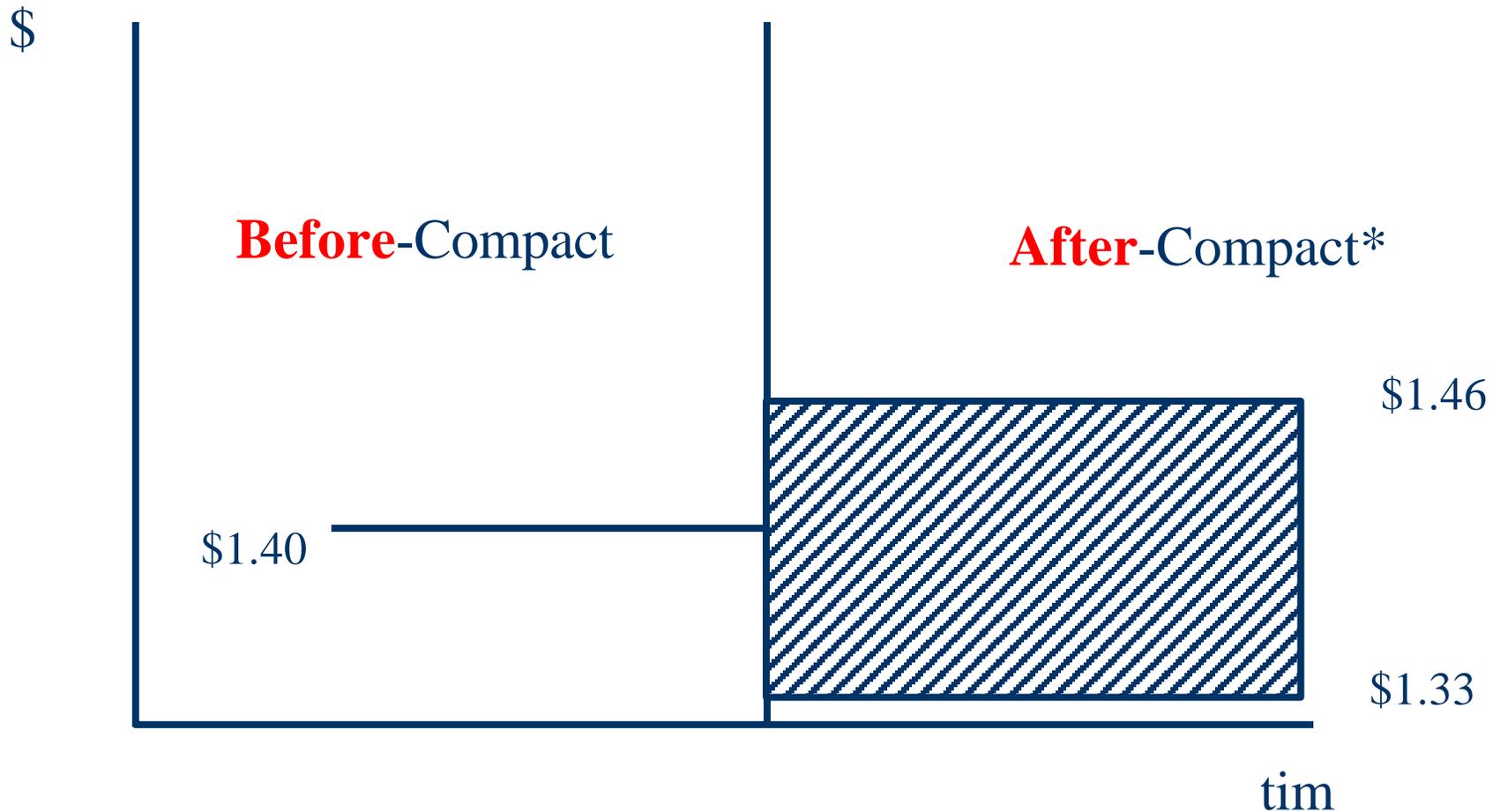
$

Before-Compact

After-Compact*

$1.46

$1.40

$1.33

tim

*Includes only 30 (out of 40) four week periods when the Dairy Compact price floor at $1.46/gal. was operative.

Figure 14.

Hartford
Stop & Shop vs All Other Supermarkets
Market Level Milk Price
March 1996 - July 2000
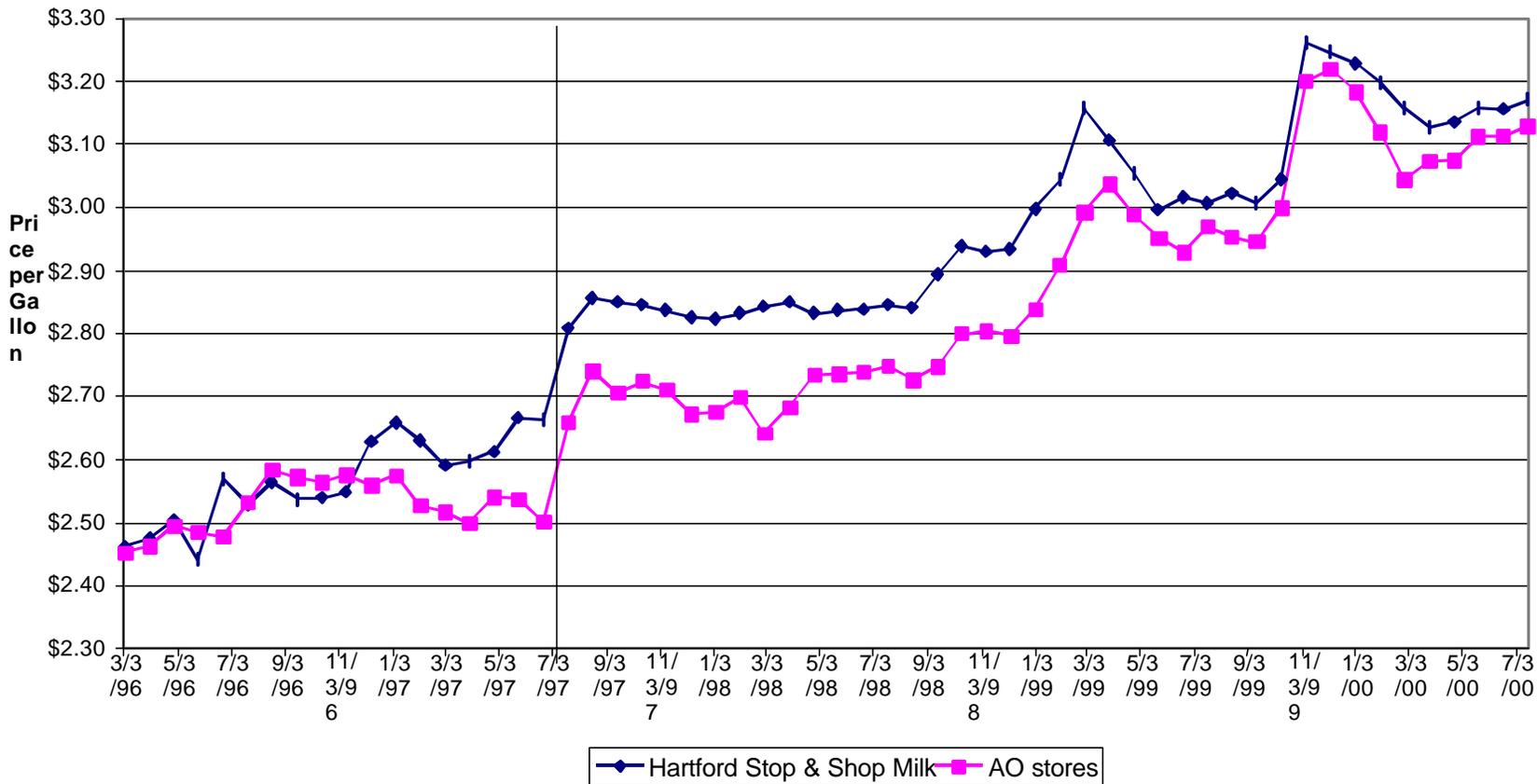
Source: Calculated from Food Marketing Policy Center IRI database.

Figure 15.

**Providence
Stop & Shop vs All Other Supermarkets
Market Level Milk Price
March 1996 - July 2000**
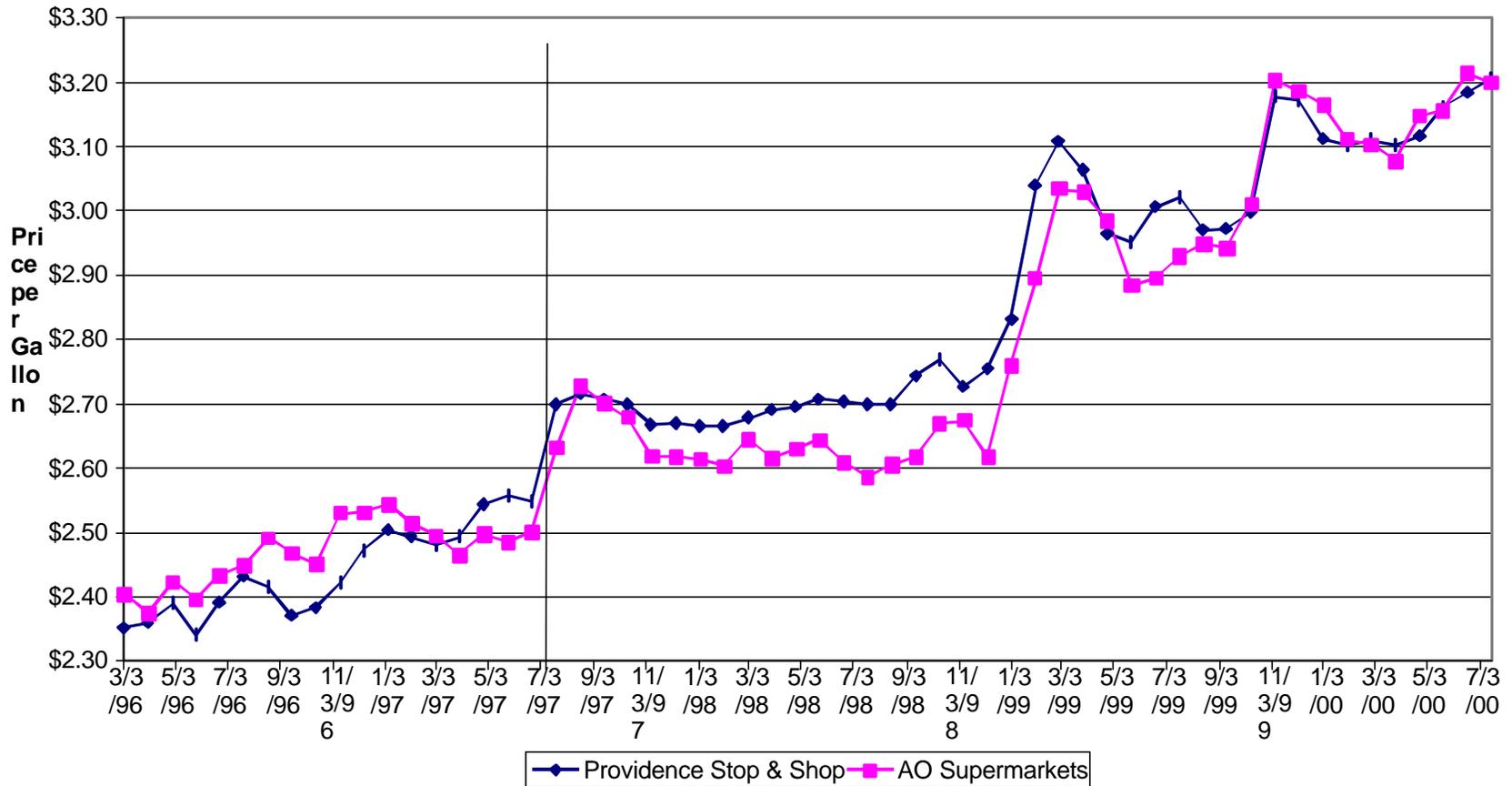
Source: Calculated from Food Marketing Policy Center IRI database.

Figure 16.

Boston
Brand Level Retail Milk Price
March 1996 - July 2000

Source: Calculated from Food Marketing Policy Center
IRI Database

Legend: Hood — Garelick — Private Label
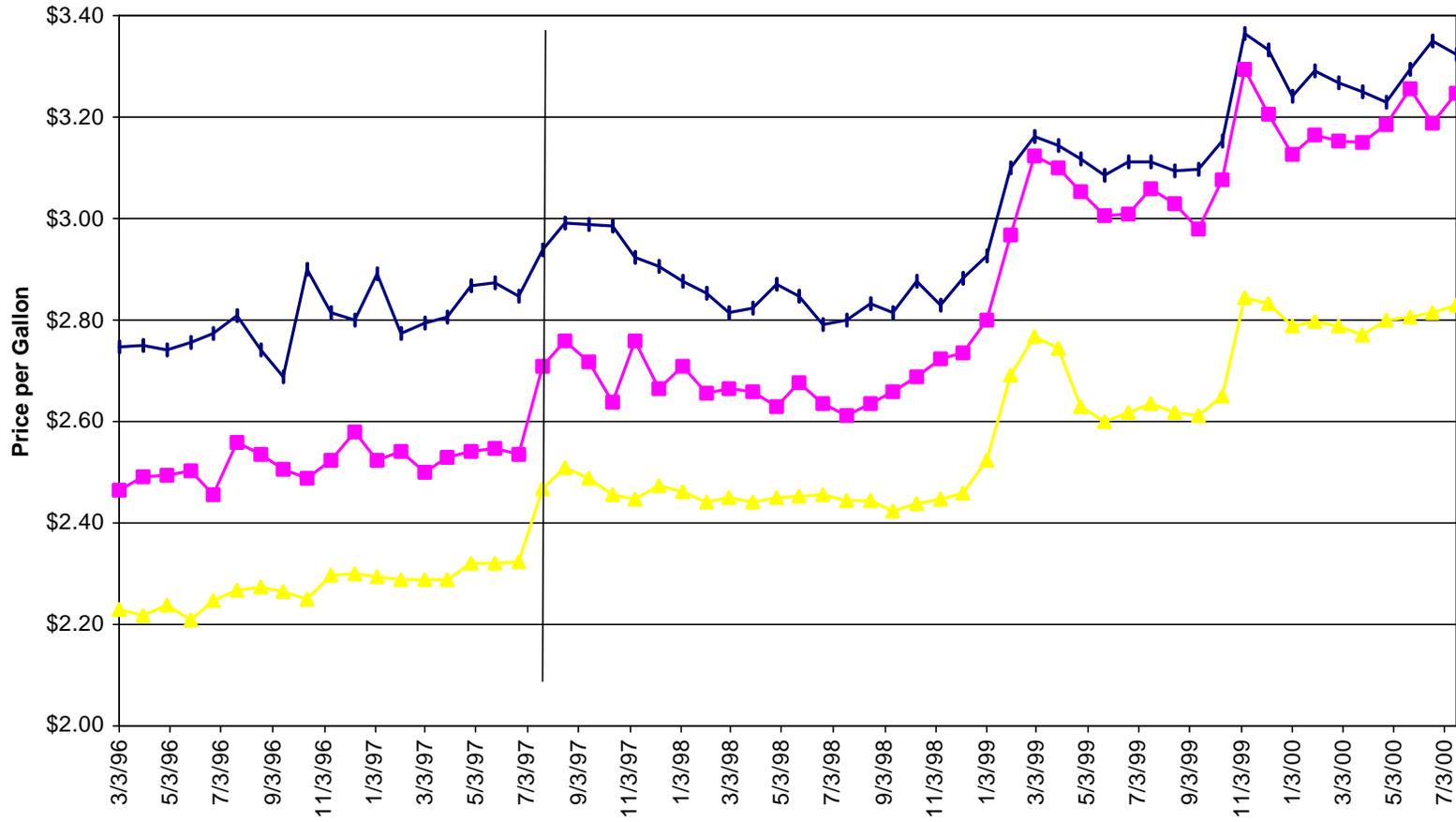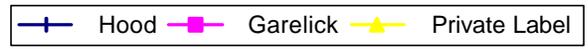
Figure 17.

Boston
Market Level Milk Volume by Brand
March 1996 - July 2000

Source: Calculated from Food Marketing
Policy Center IRI database

Hood — Garelick — Private Label
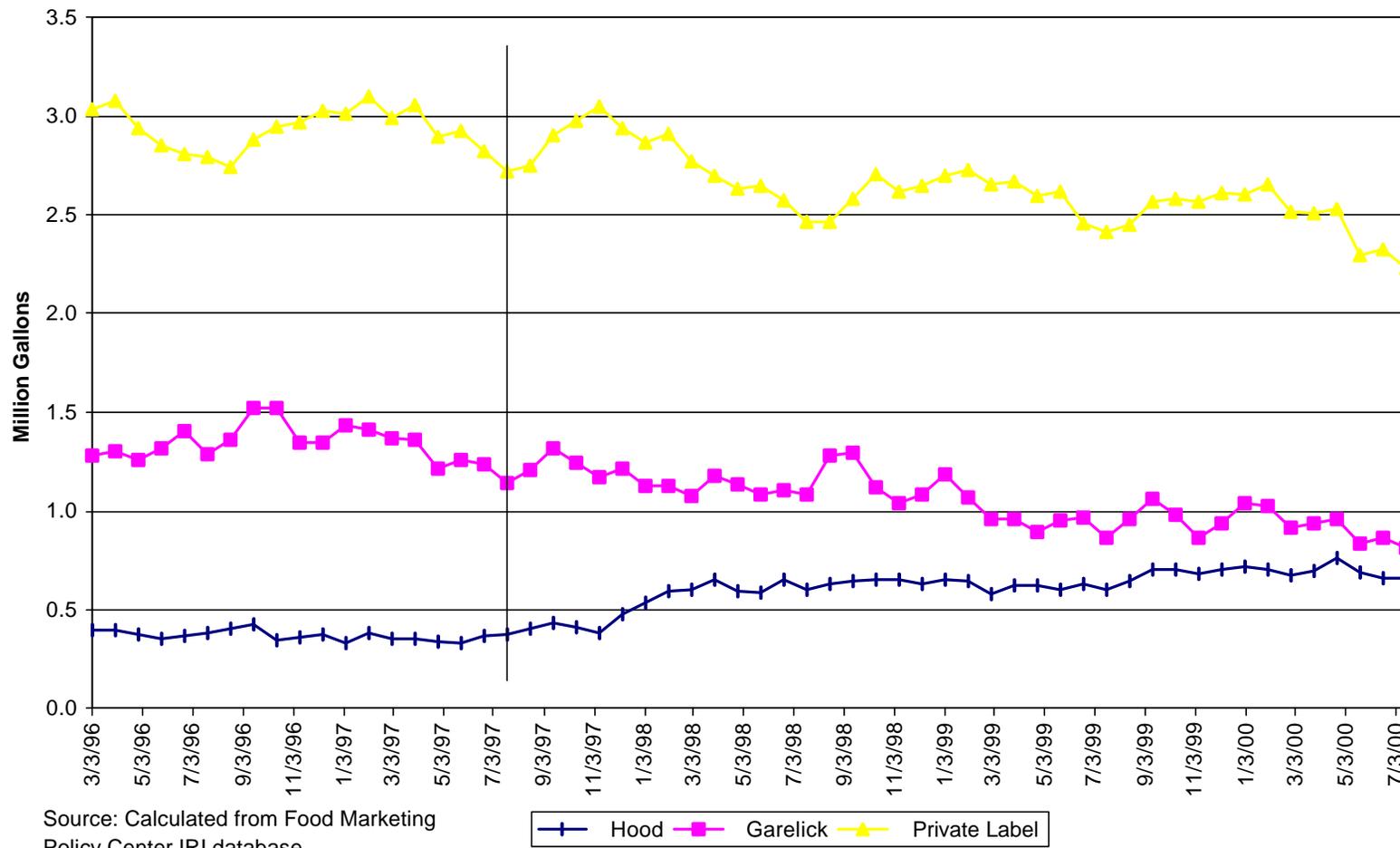
Figure 18.

Boston
Garelick Brand Market Level Milk Price and Quantity
Scatterplot and Logarithmic Regression
March 1996 - July 2000

Logarithmic Regression:*
lnQ=1.959 - 1.806 lnP_Garelick
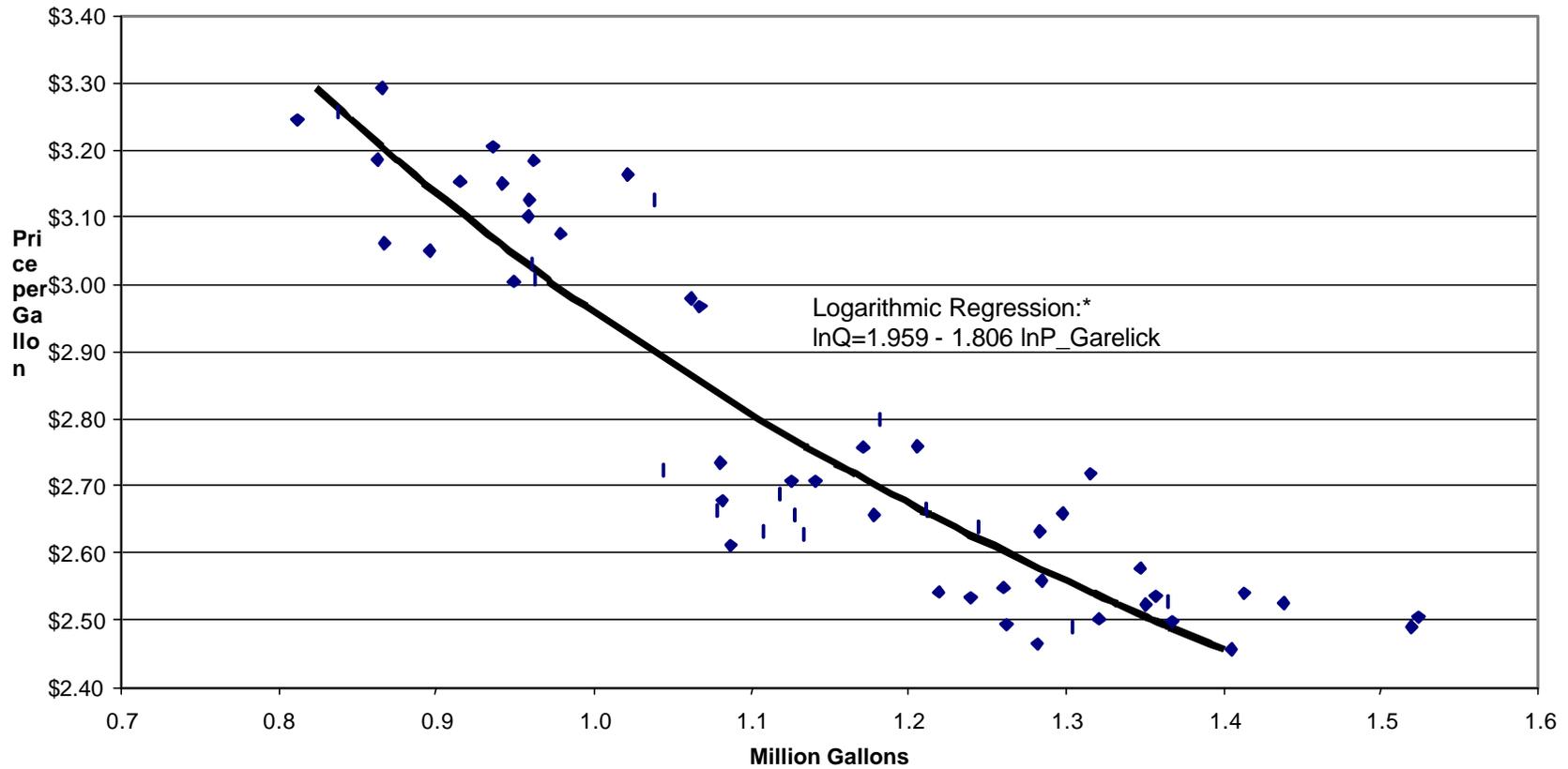
Source: Food Marketing Policy Center IRI database and calculations, Table 8; column 9.
* This equation is derived holding the price of Hood, a second variable in the equation, constant at its average value.

Figure 19.

Boston
Private Label Market Level Milk Price and Quantity
Scatterplot and Logarithmic Regression
March 1996 - July 2000

Logarithmic Regression:*
lnQ=1.474 - 0.528 lnP_PL

Price per Gallon

Million Gallons
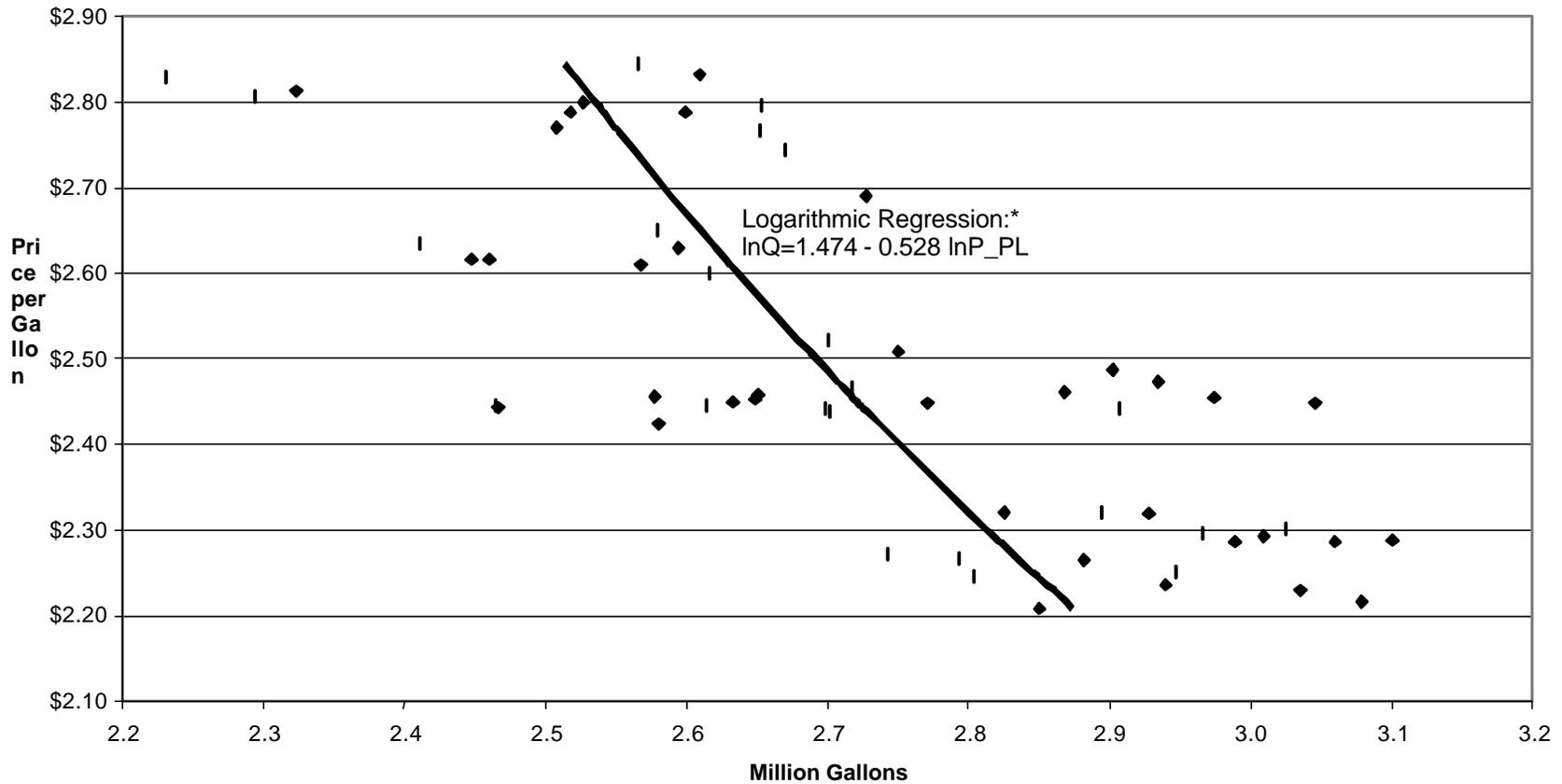
Source: Food Marketing Policy Center IRI database and calculations, Table 8; column 14.
* This equation is derived holding the price of Hood, a second variable in the equation, constant at its average value.