

# Effect of the “Soda Tax” On Grocery Store Sales in Philadelphia

By

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## Objective

To determine the effect of the tax in the City of Philadelphia on sweetened beverages on both the sale of beverages and the total sales within the grocery store compared to similar grocery stores outside the taxable area of Philadelphia, referred to as in-city stores.

## Background

In June, 2016, the City of Philadelphia adopted a tax (the “Philadelphia Beverage Tax”) on any non-alcoholic beverage, syrup or other concentrate used to prepare beverages that lists as an ingredient any form of caloric sugar based sweeteners, including but not limited to sucrose, glucose or high fructose corn syrup. The tax also applies to beverages sweetened with non-caloric sweeteners, thus drinks considered diet or zero-calorie are also taxed. The Philadelphia beverage tax went into effect January 1, 2017, and consists of a 1.5 cent per ounce tax on covered beverages. The tax is levied on distributors on each ounce of sweetened beverage they distribute in Philadelphia, if the distribution is to an entity that intends to sell the beverages at retail, in Philadelphia. Full taxation regulations can be found at [https://beta.phila.gov/media/20161101124151/Philadelphia-Beverage-Tax-regulations\\_20161031.pdf](https://beta.phila.gov/media/20161101124151/Philadelphia-Beverage-Tax-regulations_20161031.pdf).

There has been much discussion in the press and elsewhere as to the impact that the tax may have on Philadelphia city grocery stores. Most of the opinions offered were not based on quantitative data in a controlled situation. This analysis was designed to provide the quantitative data necessary to reach valid conclusions on the impact of the Philadelphia beverage tax on sales of beverages as well as on overall supermarket sales.

## Data

Sales data from a grocery retailer, with stores inside and outside of Philadelphia, was obtained and analyzed. Total beverage category sales (beverages include a variety of both taxed and untaxed products including, but not limited, to sodas, juices, milks, milk substitutes and powdered drink mixes) was analyzed from nine stores—five in the City of Philadelphia (PC store) and four (outside) Philadelphia (NPC store or out of city stores). Sales data consisted of

four - four-week periods: November 2015, February 2016, November 2016 and February 2017. Additionally, total store sales data was available for eight of these stores (such data from one store outside of Philadelphia was unavailable).

The comparison using the four time periods controls for seasonality as well as other potential alternative explanations.

The stores were part of the same chain, controlling for marketing, promotions or other sales.

To further investigate the effect of the Philadelphia Beverage Tax on the beverage category, sales data from this category was analyzed. Again, four weeks of overall beverage sales data from four time periods (November 2015, February 2016, November 2016 and February 2017) were used in the analysis with five stores in the City of Philadelphia (PC stores) and four stores outside of Philadelphia (NPC stores). To analyze a consistent set of beverage products, all items which were available in a single store but did not sell at least one unit in at least one time period (as defined by month) in that store were removed from the analysis for that store and all other stores in the sample. Thus, the analysis concentrated on the high-volume items across all stores. Each individual beverage item was coded as either taxed or not taxed by two independent experts on the Philadelphia beverage tax. Each verified the work of the other and disagreements were resolved by checking the product on the shelves of a Philadelphia retailer. After removal of products that did not sell at least one unit in at least one time period, our analyses consisted of 931 different products.

#### Nature of the analyses

In the charts and figures shown below, two time periods are depicted. One period compares the 4-week period of November 2015 with the 4-week period of February 2016, for both the taxed (PC stores) and untaxed supermarkets (NPC stores). This period preceded the adoption and imposition of the Philadelphia Beverage Tax and therefore fluctuations in beverage sales reflect normal seasonal changes or other factors in the market that are unrelated to the tax. The second time period compares the 4-week period of November 2016 with the 4 week period of February 2017. Because the tax took effect in January 2017, this comparison period shows how sales (total store sales and beverage sales) are impacted by the tax.

By including the comparison between the 4-week period in November 2015 with the 4-week period in February 2016, the second comparison permits an assessment of tax impacts without overstating losses attributable to the tax by referencing both total sales and beverage sales revenue lost during the same period a year earlier due to seasonality and other factors.

#### Summary of results

Supermarkets in the taxed area experienced losses in the taxed beverage category, the total beverage category, and overall store sales.

Supermarkets in the non-taxed areas had an increase in the taxed beverage sales, total beverage sales and total store sales.

## Results

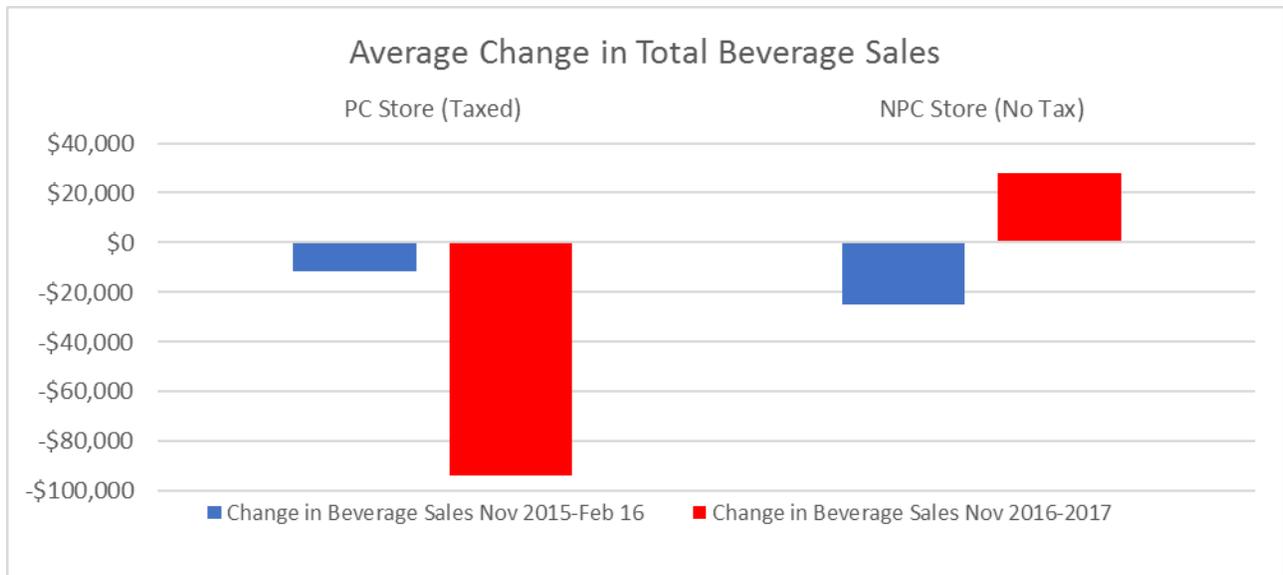
1. Taking into account the pre-tax market trend of declining beverage sales, did Philadelphia city stores have a larger loss than the non-taxed stores? **YES.**

*As previously mentioned, there is a seasonal/trending<sup>1</sup> decrease in all store sales between November 2015 and February 2016. That is, both the taxed and untaxed stores experienced a decline in total beverage sales in February 2016 as compared to November 2015. The tax accentuated this pre-existing decline in beverage sales in the taxed stores, and, importantly, reversed the decline in non-taxed stores.*

*Stores in the City of Philadelphia averaged a loss of \$11,797 in total beverage sales in February 2016 compared to November 2015. One year later, (comparing February 2017 to November 2016) this loss increased to an average total beverage sales loss of \$93,657. This greater loss, an average of \$81,860 (i.e., the difference between the pre-tax period and the post-tax period), is not seen in the non-Philadelphia stores.<sup>2</sup> On the contrary, the non-Philadelphia stores were able to increase their total beverage sales. These stores, on average, experienced a loss of total beverage sales of \$24,739 for the pre-tax period, and then a gain of \$27,843 for the post-tax period. This represents a net average gain of \$52,583 on average per store in total beverage sales for these stores outside of Philadelphia city.*

See Figure 1 below

**Figure 1**



<sup>1</sup> There is a general trend among all supermarkets across the country of decreasing sales. This may be caused by a myriad of reasons. Suffice it to say both taxed and untaxed stores had decreases in beverage sales in the pre-tax period.

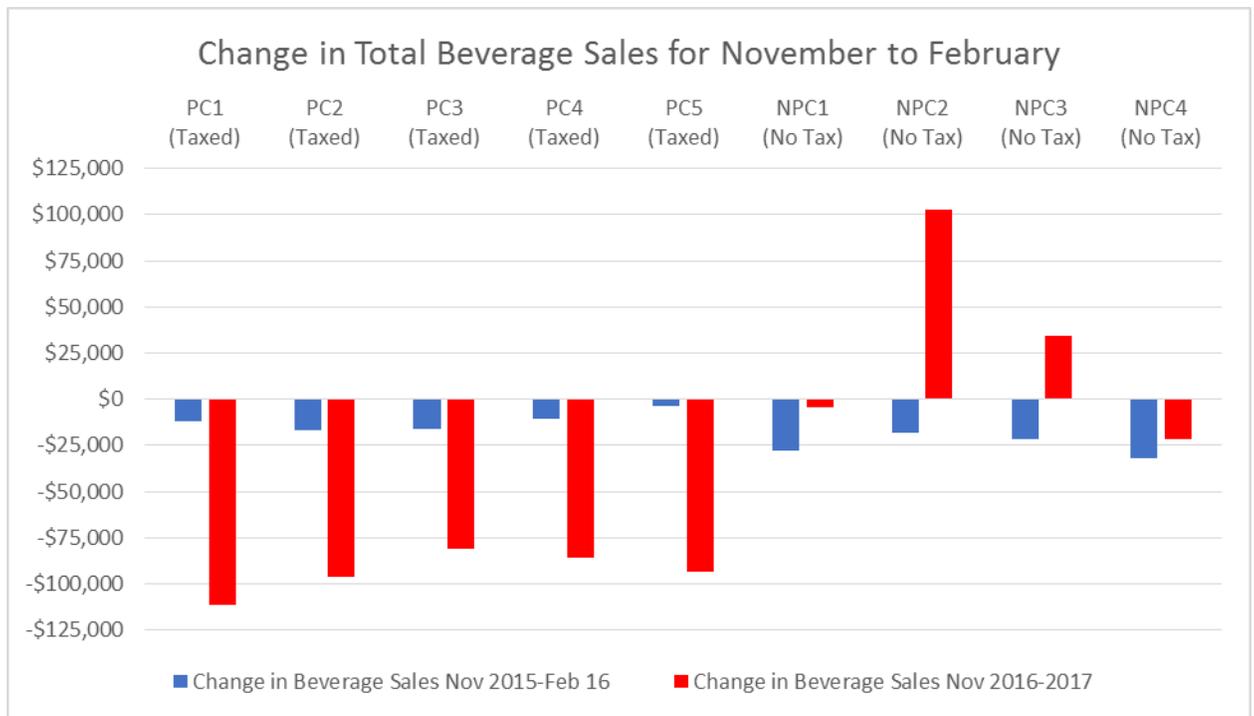
<sup>2</sup>  $\$93,657 - \$11,797 = \$81,860$

2. Was the average increase in losses associated with all of the stores, or were only one or two stores influencing the average? **The effect is seen in all stores.**

*It appears that all of the taxed stores had similar results. One of the non-taxed stores had a decrease in sales over the taxed period, but nevertheless showed a net gain as between the pre-tax and post-tax periods. Another had a very small decrease but also showed a net gain. All the stores in the taxed zone had a loss between the pre- and post- tax period and all the stores in the non-taxed area had a net increase in beverage sales.*

See Figure 2 below

**Figure 2**

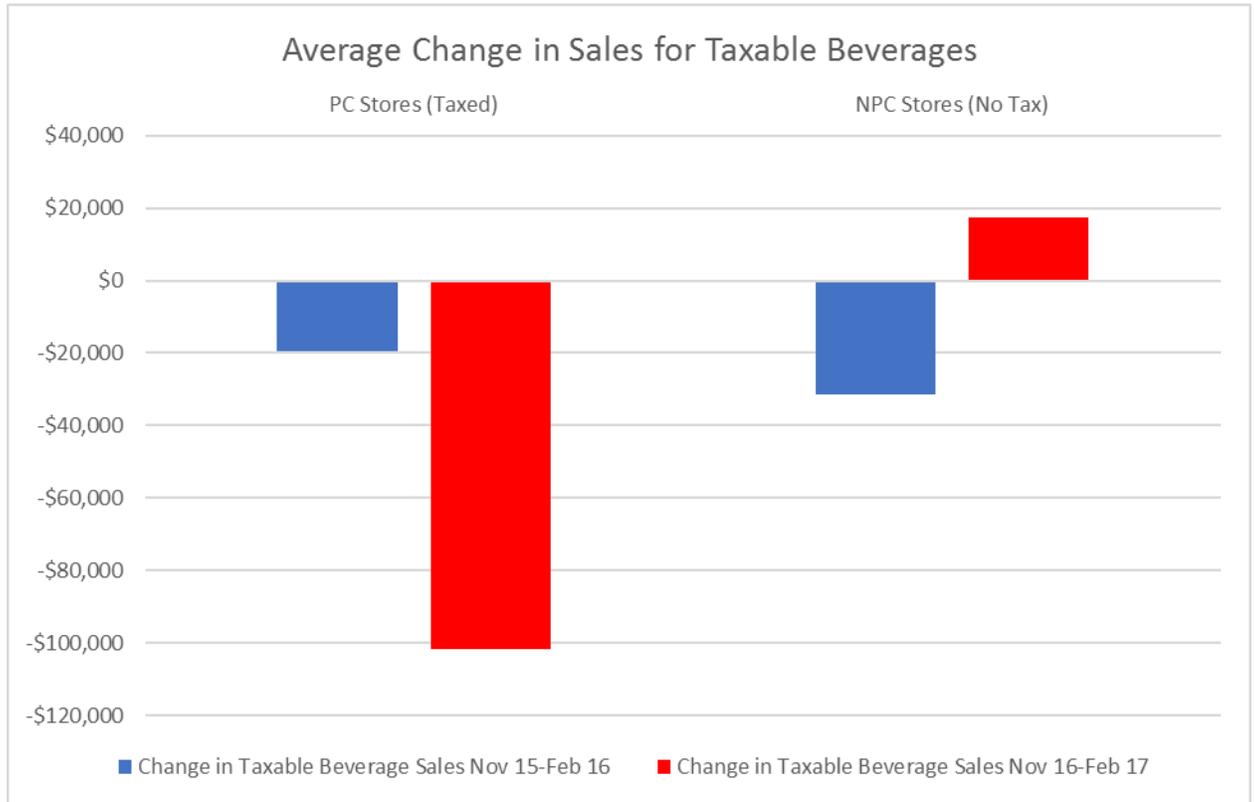


3. Are sales of the taxed beverages going down in the Philadelphia taxed stores more than they are declining in non-taxed stores? **YES.**

*On average, the Philadelphia City stores had substantial losses of sales of the beverages that were taxed, while in the same time period the non-Philadelphia stores had an increase in average sales of the exact same beverages. Philadelphia stores saw their loss in taxable beverages grow from an average loss of \$19,344 per store to a loss of \$101,589. Non-Philadelphia stores saw their loss in taxable beverages decline and turn into a net gain, moving from an average loss of \$31,316 to a net gain of \$17,562.*

See Figure 3 below

**Figured 3**



4. Was the average sales decrease of taxable beverages associated with all of the stores in Philadelphia, or were one or two driving that average? **The effect is seen in all stores.**

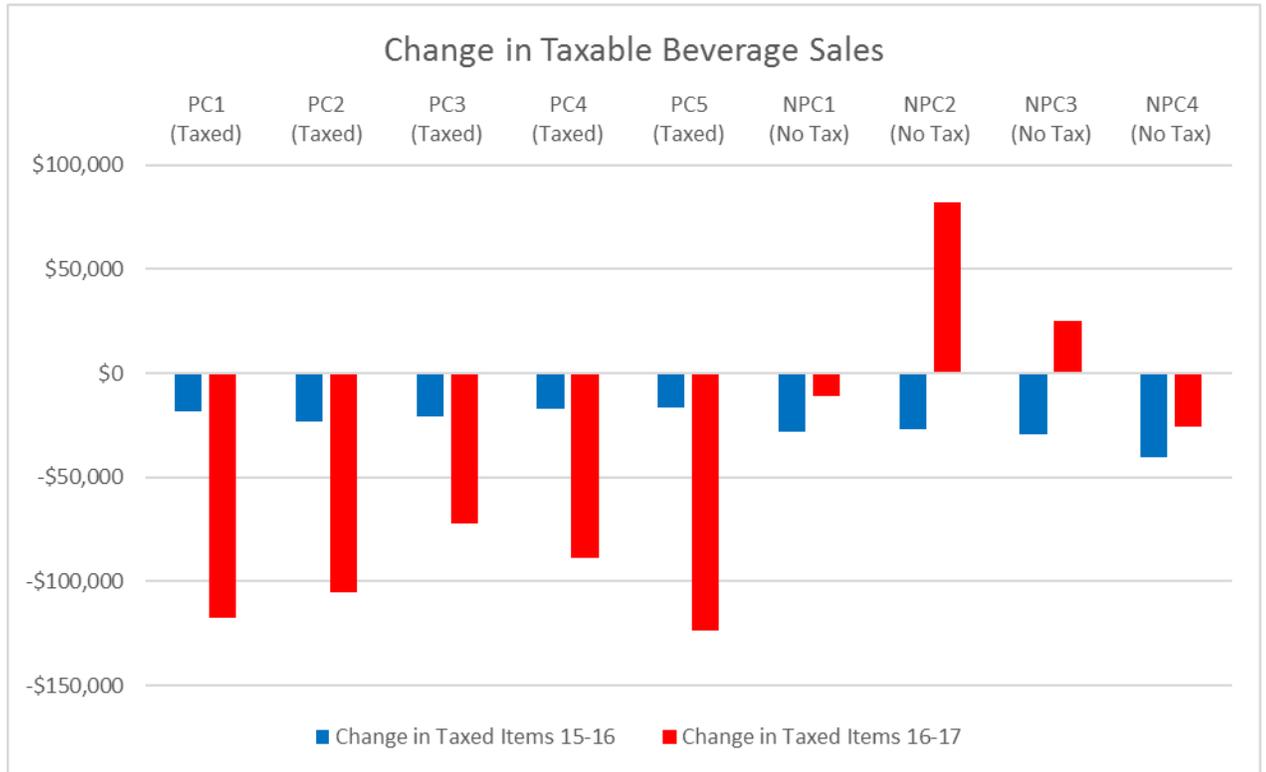
*It appears that all Philadelphia City stores had similar results—substantial losses.*

*All 4 non-taxed (out of city) stores had a net loss for the pre-tax period, but all 4 stores were able to dampen their losses, with two stores turning an actual net gain.*

*All the stores in the taxed zone had a loss between the pre- and post-tax period, and all the stores in the non-taxed area had a net increase in taxable beverage sales.*

See Figure 4 below

**Figure 4**

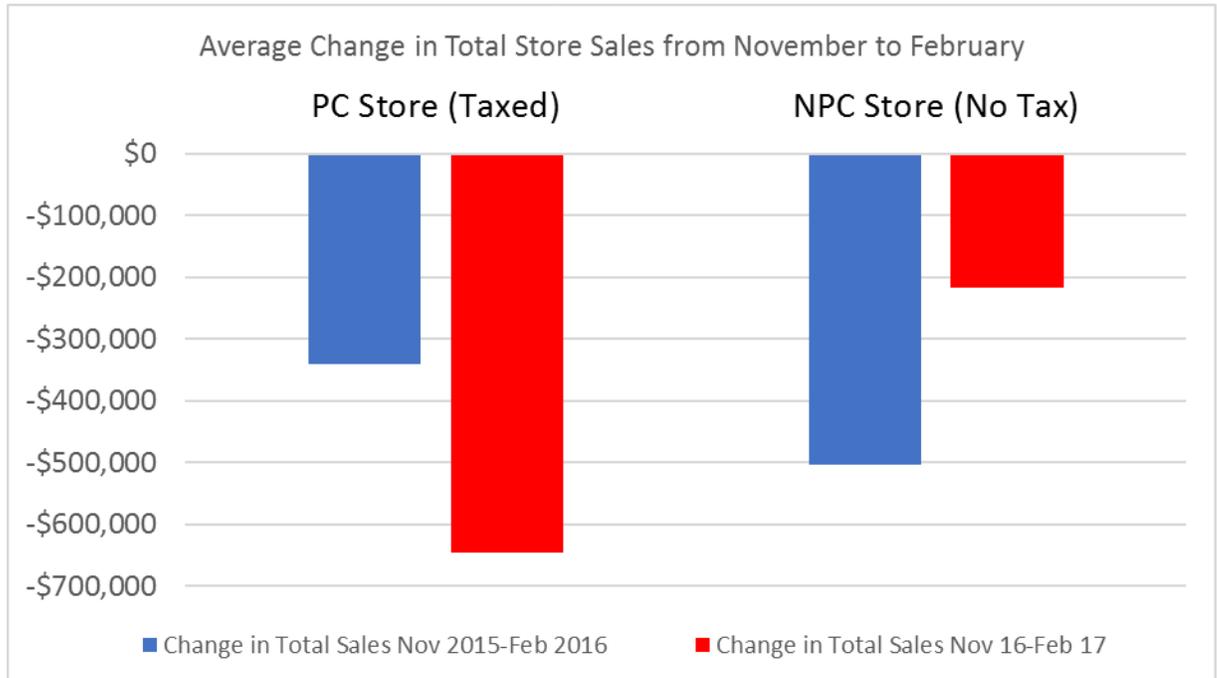


5. Did total store sales (across all food categories) drop in the Philadelphia / taxed stores?  
**YES**

*On average, store locations inside Philadelphia experienced a \$340,333 loss in total store sales between November 2015 and February 2016. However, this average loss increased to \$644,655 for the time period between November 2016 and February 2017. Stores inside Philadelphia experienced, on average, an additional loss of \$304,322 during the taxed period. Stores outside of Philadelphia saw a reversal in loss. These stores experienced an average total sales loss of \$503,597 between November 2015 and February 2016. However, this loss was dampened as these stores suffered an average loss of only \$216,775 between November 2016 and February 2017. Essentially, stores outside of Philadelphia experienced, on average, a sales gain of \$286,822 during the taxed period. Combining the average additional loss for total sales for PC retailers with the increase in total sales for NPC retailers, the data reveals an average swing of \$591,144.*

See Figure 5 below

**Figure 5**

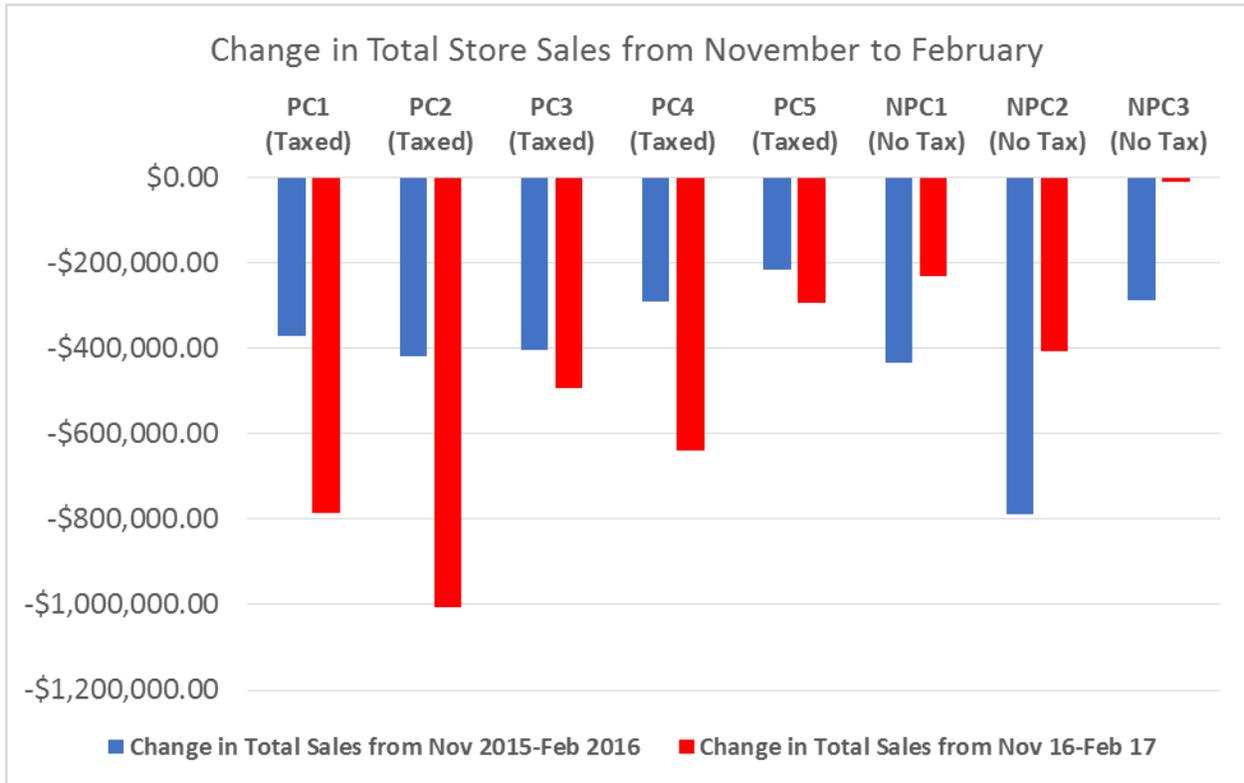


6. Was the average decrease in total store sales associated with all the stores in Philadelphia, or were one or two stores influencing the average? **The effect is seen in all stores.**

*Results indicate that each store in Philadelphia experienced a greater loss between November 2016-February 2017 than November 2015-February 2016. This increased loss in total store sales ranged from \$78,759 (store PC5) to \$587,082 (store PC2). Conversely, results demonstrate that each non-Philadelphia store (out of city) saw a dampening of their sales loss, ranging from an increase in sales of \$200,722 (NPC Store 1) to \$384,079 (NPC Store 3).*

See Figure 6 below.

**Figure 6**



**7. Are the lost sales significant enough to lead to labor reductions? YES**

*The average monthly loss in sales per Philadelphia store of \$304,322 will lead to some reduction in labor force. Supermarkets generally base total labor costs for store operations as a percentage of revenue (often between 14% to 18%). However, the way in which these losses may be recouped is unclear. Retailers may choose to lay off corporate employees, store management, full time store workers, part time store workers or some combination thereof. While the exact nature of the labor downsizing is unclear, the reduction in labor force seems highly likely.*

*This reduction is not likely to come in the form of one massive layoff. Instead, it likely will be executed over a longer period of time as managers wait for an equilibrium where they are confident in the average monthly loss they will experience due to the beverage tax.*

**8. Will other supermarket supplier businesses be affected? YES**

*While specific financial estimates of the impact to beverage suppliers cannot be made with this data alone, there already are publically available news articles suggesting layoffs occurring at beverage suppliers. In addition, the decline in sales will likely lead to distributors making fewer trips and thus employing fewer drivers, truck loaders, etc. Additionally, if distributors decide to*

*maintain their existing route structures, they will be less efficient (delivering less product per trip) and they would have to make cuts elsewhere to maintain their current level of profitability.*

### Conclusion

There is almost no scenario that would lead one to believe that the Philadelphia Beverage Tax will permit taxed supermarkets to maintain existing labor forces. Furthermore, the drop in supermarket sales will negatively impact distributors and other channels of distribution companies serving those supermarkets. While the reduction in force may take a few months to reach an equilibrium level, a labor reduction seems inevitable.