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PPPA 6007

November 14, 2017

The Impact of Illinois's Proposed Soda Tax

Introduction

The state of Illinois is proposing a soda tax on sweetened beverages. This would be considered an excise tax, in other words, a tax which is only levied on certain goods. The new legislation has been pushing for H.B. 4083 which would impose a rate of 1.75 cents per ounce, which means the tax would be about $1.18 for a 2-liter bottle of soda (Geib, Phil 2017). Proponents of the tax say it will reduce consumption of unhealthful beverages and help the state provide better access to nutritious foods in low-income neighborhoods and communities of color (McCarthy, M 2014). This memo analyzes the effect this tax would have on the current demand for soda among Illinois consumers. It is anticipated that producers and consumers will share the 1.75 cent tax burden. Therefore, soda consumers will be paying more for a 2-liter bottle of soda and producers will earn less per bottle of soda. As a result, soda consumption would decrease but there would still be a demand which would generate some revenue for the state's nutrition initiative.

Policy Background

Illinois currently imposes a 0.10 cent excise tax on soda. H.B. 4083 would add 1.65 cents to the current tax. Thus, the proposed excise tax on soda would be 1.75 cents. Proponents of this proposition argue soda companies market heavily to children in those communities with low-income, where more people struggle with sugar-linked health problems, such as obesity (Geib, Phil 2017). They anticipate that this tax would accumulate enough revenue to fund the state's

healthcare program for low-income residents in Illinois (Brutvan, Robert, 2017). However, the revenue that could be derived from this increased tax is based on how the tax is distributed between soda companies and soda consumers. Likewise, it depends on the price elasticity of demand for soda.

Methodology

In order to determine the new demand of soda under H.B. 4083, we need to determine the following:

a. The current average price of a 2-liter bottle of soda in Illinois (P o)

b. The new price of a 2-liter bottle of soda after the proposed tax (P n)

c. The current demand of soda (Q o)

d. The price elasticity of demand for soda

Calculations

a. As of 2016, the average price of a 2-liter bottle of soda in Illinois was estimated as $1.99 (Brutvan, Robert, 2017). This estimates includes the current $0.10 excise tax and a 1.25% sales tax that is added on to all food purchases in Illinois (Brutvan, Robert, 2017).

b. In order to determine the new price of a 2-liter bottle of soda, we need to determine how the 1.75 tax burden would be shared between soda companies and soda consumers. The proposed tax would shift the supply curve inward by the amount of the tax but the price would not increase by that amount [See Fig 1]. Additionally, it is unlikely that the burden of the tax would be passed on to the consumer or producer

solely. Because it is uncertain how the tax burden will be shared, we will estimate three new prices of a 2-liter bottle of soda.

    i.   In the first estimate, consumers bear the majority of the tax burden. Majority tax burden is defined as 2/3 of the 1.75 cent excise tax. If soda consumers bear the majority of the tax burden, the new price of a 2-liter bottle of soda would be $3.15.

    ii.   In the second estimate, producers bear the majority of the tax burden and the new price would be $2.57.

    iii.   In the third estimate, consumers and producers share the tax burden equally. Under this scenario a 2-liter bottle of soda would cost $2.87.

c.   According to Illinois State Water Survey conducted by the Prairie Research Institute, soda consumption among adults in Illinois is between 36.0% and 40.2% for drinking soda more than one time a day (Kelly, Walt, 2012). In addition, it is estimated that in 2014, the U.S. soft drink market size was valued at about 98.43 billion U.S. dollars (Han E, Powell, 2014). Based on market equilibrium standards we can conclude that the current price is $1.99, and soda consumption generates 98.43 billion sodas [See Fig. 3].

d.   Due to the various amounts of substitutes available, soda has typically been portrayed as a relatively elastic good. In a study published in the journal *Economics & Human Biology* in 2015, the price elasticity for sugar sweetened beverages and soft drinks was between -1.06 and -1.16 (Colchero, M.A. 2015). Additionally, a 10% price increase was association with a decrease in quantity consumed of soft drinks by 10.6% and 11.6% for sugar sweetened beverages (SSB) (Colchero, M.A. 2015). This

study also found that a price increase in soft drinks was associated with larger quantity consumed of water, milk, snacks and sugar and a decrease in the consumption of other SSB, candies and traditional snacks (Colchero, M.A. 2015). Thereby, supporting the idea that soda has comparable substitutes individuals will turn to when prices rise.

Results

I am going to use -1.06 as the low elastic estimate, where consumers are inelastic to price change, and -1.16 as the high estimate, where consumers are more responsive to price change. This will give me a range to determine the approximate *true* quantity demanded that could fall under H.B. 4083 [See Fig. 4]. I will use the equation below to calculate the new quantity demand of 2-liter soda bottles.

$$\text{Price Elasticity of Demand} = \frac{\dfrac{Q_1 - Q_0}{Q_0}}{\dfrac{P_1 - P_0}{P_0}}$$

When producers endure the majority of the proposed tax, the new quantity of soda demanded could fall between 65.15 billion sodas and 68.02 billion sodas. When the tax burden is shared equally between consumers and producers, the new quantity demanded could fall between 47.93 billion sodas and 52.29 billion sodas. Lastly, if consumers have the majority of the tax burden, the new quantity demanded could fall between 31.87 billion sodas and 37.61 billion sodas.

Conclusion

Given these results, the demand of soda under H.B. 4083 would decrease, regardless of who endures the burden of the tax. However, when the majority of the tax burden is on the consumers, we will see the greatest decrease in the demand for soda, which is expected. In conclusion, it is important that proponents of H.B. 4083 realize the two elements that will impact the new demand for soda: (1) consumer's proportion of the 1.75 cent tax burden and (2) how responsive soda drinkers are to price changes.

Lastly, even though the demand decreases, there would still be consumers and producers in the market that would provoke funds from the proposed soda tax. Therefore, H.B. 4083 would accomplish its goals of reducing soda consumption and generating revenue for the state to provide better access to nutritious foods in low-income neighborhoods and communities of color.
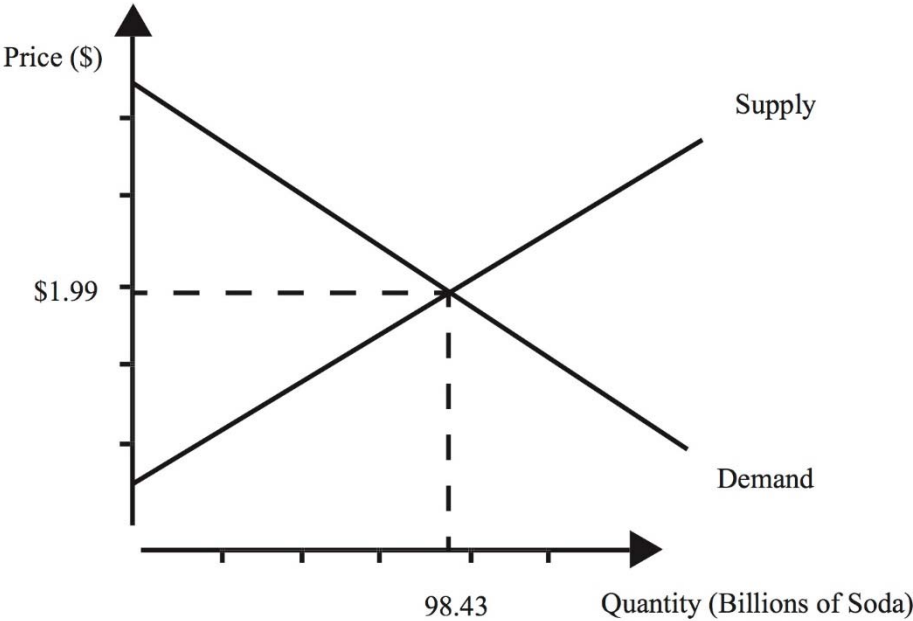
Appendix

Fig 1: The New Market under H.B. 4083
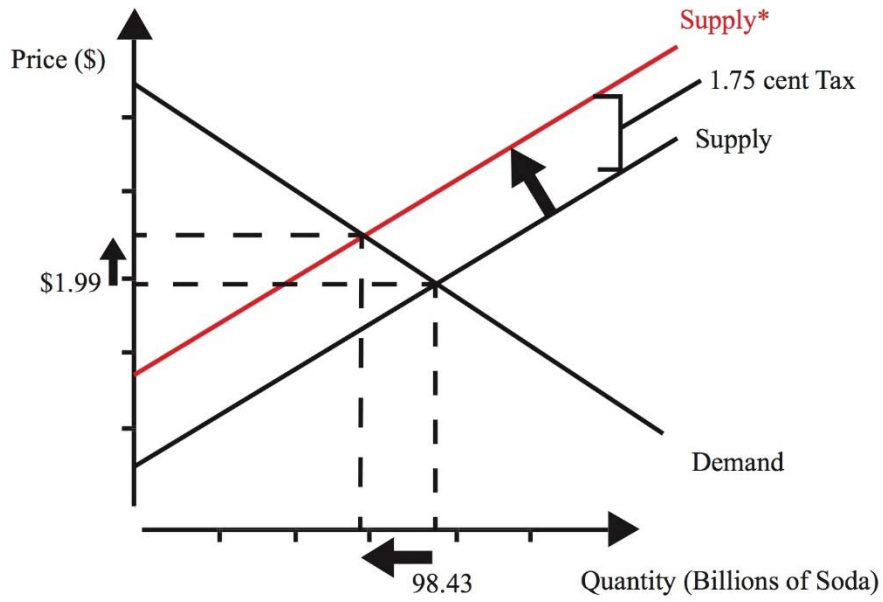
Fig 2: Tax Burden

Burden	Calculation (Po + %tax) * sales tax	New Price
Pn1: Consumer has majority burden	(1.99 + 1.75(2/3)) * 1.25%	$3.15
Pn2: Producer has majority burden	(1.99 + 1.75(1/3)) * 1.25%	$2.57
Pn3: Tax burden is shared equally	(1.99 + 1.75(1/2)) * 1.25%	$2.87

Fig 3: The Current Market

Fig 4: All Possible New Quantities Demanded

	New Prices		
Elasticity	**$2.57**	**$2.87**	**$3.15**
-1.06	68.02 Billion Sodas	52.29 Billion Sodas	37.61 Billion Sodas
-1.16	65.15 Billion Sodas	47.93 Billion Sodas	31.87 Billion Sodas

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