The effect of the inclusion of groceries in the sales tax base on rural grocery stores

BACKGROUND

Kansas is one of only fourteen states that includes food for at-home preparation (groceries) in the state sales tax base and one of only seven that taxes them at the full retail sales tax rate (Federation of Tax Administrators, 2015). The taxing of groceries causes concern among several groups. One group are those who are concerned about rising obesity levels, especially among youth. They point out that by taxing groceries, the state raises the price of groceries that households must pay. They also point out that since the sales tax is a tax levied on the value of purchases, the effective cost of the tax increases with the purchase of higher dollar value food products. This may cause a substitution effect toward lower priced convenience foods, as it is often pointed out that these convenience foods are often cheaper than fresh foods. Even in the protein category, quality rises with price. This substitution effect may lead to higher rates of obesity and poor health.

A second group concerned with the inclusion of groceries in the sales tax base are those who are concerned with the incidence effects of the tax. The perception is that the purchase of groceries consumes a higher portion of low-income households' disposable income. Therefore the inclusion of groceries leads to lower income households paying a larger portion of their income in taxes.

In this paper we examine a concern related to the former issue. Another effect of higher prices of groceries could be a shifting of consumption from groceries and to other retail categories. This substitution effect will cause a reduction in grocery sales and a corresponding reduction in employment in this sector. There is a case to be made that rural grocery stores are disproportionately affected by the inclusion of groceries in the sales tax base. In larger metropolitan areas, the effects of sales shifting to other retail establishments should result in those workers having higher incomes – a simple shift of income. However, in more rural areas many categories of retail establishments are not present. So the spending of retail dollars will shift outside of the area with the substitution of other categories of retail spending for spending on groceries. We estimate the effect of the inclusion of groceries in the sales tax base using a regional economic model. We find that the sales tax has a small negative effect on rural grocery stores, even after accounting for required tax and spending changes to balance the state budget.

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LITERATURE REVIEW

In order to better frame our analysis, we consulted both the academic and professional literature on the economic effects of taxing groceries. In neither literature is there a mention of a specific analysis of the effects of taxing groceries on the retail grocery industry. There are, however, numerous studies of the price elasticity of demand for various food products, which should inform any model of economic effects of taxation. Looking across several categories of food products (Dairy, Dairy Products, Fish, Fruit, Meat (including poultry), and Vegetables) the average price elasticity of demand appears to be -0.45, indicating that a one percent increase in the price of groceries will produce a 0.45 percent decrease in the quantity demanded. Table 1 lists the price elasticities of demand we used in our calculations along with the sources used to obtain them.

Table 1. Estimates of the Own-Price Elasticity of Demand for Various Food Categories

Food Category	Own-price Elasticity of Demand	Source
Dairy	-0.79	Huang and Lin, 2000
Dairy Products	-0.30	Richards and Patterson, 2003
Fish	-0.23	Huang, 1986
Fruit	-0.72	Huang and Lin, 2000
Meat	-0.45	Richards and Patterson, 2003
Vegetables, Fresh	-0.21	Richards and Patterson, 2003

METHODOLOGY AND DATA

Ideally, we would like to empirically estimate the effects of taxing groceries on rural grocery stores by comparing areas in terms of the number of grocery stores and employment in those stores to data on effective sales tax rates. However, to our knowledge this data is not available for several rural counties due to privacy issues (the usual source of that information is the County Business Patterns data but they exclude reporting on areas with fewer than 5 organizations to preserve privacy).

Therefore, we rely on estimates from a regional economic modeling software. We use the IMPLAN software (IMPLAN Group, LLC, 2014). This software produces estimates of changes in economic activity in various sectors of the economy given a change in one of those sectors. As an example of the use of IMPLAN, the Economic Research Service (ERS) of the US Department of Agriculture selected IMPLAN to model the effects of the American Recovery and Reinvestment Act (ARRA) of 2009 (Kort, 2009). The model would be used to trace out the linkages among various sectors of the economy to project the effects of an increase in public spending on infrastructure projects. The basis of the IMPLAN model is a "social accounting matrix" that describes how a change in

one sector of the economy will affect other sectors of the economy. So in the ARRA example, researchers at the ERS would enter an increase in spending in the construction sector of the economy. The model shows estimates of what the construction sector purchases in terms of inputs such as concrete, iron, and other materials as well as labor inputs. These purchases create sales for those input sectors, which in turn are used to purchase inputs (for non-labor sectors) from other sectors. For the labor input, households use labor income to make retail purchases, which in turn creates its own set of follow-on effects. The sum of all of these effects is called a "multiplier" and describes the size of an effect in various sectors caused by a $1 change in a given sector. So if the multiplier for construction is 1.75, each $1 change in the construction sector will cause a net increase of $1.75 across all sectors. Multipliers are available in IMPLAN for aggregate changes as well as by sector, allowing tracing of effects across sectors.

Sales taxes on groceries should cause a reduction in spending in the retail grocery store sector. The IMPLAN model will estimate the ultimate economic effect of this reduction in spending caused by the sales tax. There are three pieces of information needed to calculate the reduction in spending on groceries. One is the existing level of retail grocery sales in a given rural area. We use data from the IMPLAN system for this purpose (the original source of data was internal US Census data obtained during the 2012 Economic Census). We selected 10 of the smallest counties in Kansas at random to perform the analysis. The counties along with their retail grocery sales (from IMPLAN sector 324 – Retail Stores – Food and Beverage) are shown in the left two columns of Table 2.

Table 2. Counties Included in the Analysis, Retail Grocery Sales, and Estimated Tax Effect on Grocery Sales.

County	Grocery Sales, 2012	Estimated Reduction in Grocery Sales
Chase	$1,832,655.01	$52,162.32
Elk	133,156.64	3,790.00
Greeley	395,665.16	11,261.70
Lane	1,703,809.55	48,495.03
Lincoln	1,429,214.73	40,679.32
Morton	1,885,746.91	53,673.46
Ness	2,711,544.74	77,177.90
Sheridan	1,444,485.81	41,113.97
Stanton	955,054.53	27,183.44
Woodson	1,310,582.03	37,302.71

The other pieces of information necessary to calculate the reduction in grocery sales due to the sales tax are the increase in the effective price of the food caused by the tax and the price elasticity of demand for groceries. For the increase in the price of food we used the state sales tax rate of 6.15%. We used a price elasticity of demand of -0.45, reflecting the literature cited in Table 1. Combining these two figures, we estimate that existing grocery sales are 2.77 percent lower than they would be due to the tax. In the right column of Table 2, we show the calculated effects of the sales tax on grocery sales for each county. We then entered these amounts into the IMPLAN software to produce estimates of the economic effects on grocery stores in the county.

The estimates obtained from IMPLAN in this first stage of the analysis do not take into account the need for the state to achieve fiscal balance. Like most states, the state of Kansas is required to submit a balanced budget. Therefore any decreases in sales taxes must be balanced by either spending cuts or increases in other taxes. Either of these changes is likely to produce a change in the amount of grocery store sales in an area. So in order to produce a final estimate of the effect of the sales tax on grocery stores, we must account for "balanced budget" effects. Without knowing the specific tax or spending change, we employ the modeling convention of an across the board income tax change, changing household income in IMPLAN by an amount equal to the percentage of the across the board tax increase. For the state of Kansas, a 2.19 percent change in the income tax was calculated to produce revenue equivalent to the sales tax (using an estimated labor supply elasticity of 0.1 – further calculations available from the author). In table 3, we show estimates of total household income from IMPLAN, along with the effects of the income tax change. As in the first step, we then enter these changes into the IMPLAN software to obtain estimates of the effects on the retail grocery sector in each county.

Table 3. Household Income and Estimated Effect of Income Tax Change, Sample Counties.

County	Household Income, 2012	Estimated Effects of Income Tax Change
Chase	$36,772,934	$803,577.05
Elk	21,219,402	463,694.97
Greeley	23,196,702	506,903.73
Lane	38,207,208	834,919.38
Lincoln	38,551,904	842,451.82
Morton	68,995,656	1,507,721.02
Ness	64,441,611	1,408,204.18
Sheridan	47,658,650	1,041,456.12
Stanton	42,700,580	933,110.37
Woodson	28,917,680	631,920.85

RESULTS

Table 4 shows the estimates of effects on "value added" in the Grocery Store sector of each county's economy, before and after adjusting for balanced budget effects. Value added is a measure of the economic contribution of each sector, roughly what the sector would contribute to Gross Domestic Product. It includes labor compensation, net taxes on production, and firm profits and is the basic measure of how well off a sector is made from some change in the economy. In eight of the ten sample counties, the sales tax is estimated to reduce the economic activity of grocery stores, even after netting out balanced budget effects. The effects are small, but we can conclude that in most cases the inclusion of groceries in the sales tax base causes a negative economic effect on rural grocery stores.

Table 4. Household Income and Estimated Effect of Income Tax Change, Sample Counties.

County	Value Added Change Before Balanced Budget Adjustment	Value Added Change After Balanced Budget Adjustment
Chase	-$11,183.00	-5,845.03
Elk	-918.00	-548.96
Greeley	-2,174.20	-634.15
Lane	-5,572.40	343.33
Lincoln	-7,909.50	-3,162.61
Morton	-10,585.30	218.64
Ness	-15,480.40	-5,774.83
Sheridan	-7,973.70	-2,394.54
Stanton	-5,693.10	-1,425.44
Woodson	-7,485.00	-4,097.09

Table 4 shows the effects on employment and labor income in the rural grocery stores. Labor income is total compensation paid by workers to employees. After netting out balanced budget effects, employment is slightly reduced in four of ten counties by about 0.1 full-time equivalent employee, with labor income falling in eight of ten counties. Therefore, the sales tax appears to reduce labor income.

Table 5. Effects of Grocery Sales Tax on Grocery Store Labor Income and Employment (in parentheses), Before and After Balanced Budget Adjustment.

County	Labor Changes Before Balanced Budget Adjustment	Labor Changes After Balanced Budget Adjustment
Chase	-$8,213.30 (-0.2)	-$4,292.86 (-0.1)
Elk	-786.00 (0.0)	-469.95 (0.0)
Greeley	-1,360.50 (-0.1)	-396.84 (0.0)
Lane	-4,044.70 (-0.1)	249.17 (0.0)
Lincoln	-4,992.30 (-0.2)	-1,996.14 (-0.1)
Morton	-6,832.20 (-0.3)	141.05 (0.0)
Ness	-10,280.30 (-0.4)	-3,834.98 (-0.1)
Sheridan	-5,010.20 (-0.2)	-1,504.60 (0.0)
Stanton	-4,055.40 (-0.1)	-1,015.41 (0.0)
Woodson	-4,987.80 (-0.2)	-2,730.19 (-0.1)

CONCLUSIONS

Using regional economic modeling software and reasonable assumptions about effects of a sales tax and alternative income tax, we find that the sales tax on groceries causes a small negative effect on rural grocery stores. The economic output and value added in the economy by these enterprises is reduced by the sales tax, even when compared to an alternative income tax that would produce the same amount of revenue for the state. Further, workers at rural grocery stores see lower compensation due to the sales tax on groceries and employment in rural groceries is slightly lower than it would otherwise be without the tax. If one goal of the state legislature is to enhance economic development in smaller communities, it might well consider shifting the burden from a sales tax on groceries to the income tax.

REFERENCES

Federation of Tax Administrators. (2015). Tax Rates/Surveys - Tax Rates. Retrieved May 10, 2015, from http://www.taxadmin.org/fta/rate/tax_stru.html

Huang, K. (1986). US Demand for Food: A Complete System of Price and Income Effects. (Technical Bulletin 1714). Washington, DC: United States Department of Agriculture.

Huang, K., & Lin, B. (2000). Estimation of Food Demand and Nutrient Elasticities from Household Survey Data.
(Technical Bulletin 1887). Washington, DC: United States Department of Agriculture.

IMPLAN Group, LLC. (2014). IMPLAN System. Available at www.IMPLAN.com.

Kort, J. R. (2009, April 9, 2009). [Selection of Method to Assess Economic Impacts of ARRA 2009].

Richards, T. J., & Patterson, P. M. (2003). A Bilateral Comparison of Fruit and Vegetable Consumption: U.S. And Canada. Paper presented at the American Agricultural Economic Association Annual Meeting, Montreal, Quebec.