A GRADUAL REDUCTION OF THE SALES TAX ON FOOD IN VIRGINIA

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The authors found that food retailers would incur sizeable incremental costs depending on the mix of labor and capital utilized if a dual tax structure was imposed. Thus, the tax savings to consumers then would be offset not only by the recoupment of the lost revenue by government, but also by the incremental costs incurred by the food retailers.

INTRODUCTION

Under the authority of the Virginia Retail Sales and Use Tax Act of 1966, the Department of Taxation administers a uniform sales and use tax consisting of a three percent state tax and a one percent local option tax, making a combined rate of four percent. The local one percent tax is levied by all cities and counties, but cannot be imposed by towns.

House Joint Resolution No. 194 established a Joint Subcommittee of the House and Senate Finance Committee to study the sales and use tax on food products for home consumption. Specifically, the resolution directed the Joint Subcommittee to conduct a study of all practical means of replacing such lost revenues (5). Presently, 26 states and the District of Columbia either exempt or partially exempt food products from the sales and use tax (Table 1).

Table 1. States that Either Exempt or Partially Exempt Food Products From the Sales and Use Tax

California	Minnesota
Colorado	Nevada
Connecticut	New Jersey
District of Columbia	New York
Florida	North Dakota
Illinois	Ohio
Indiana	Pennsylvania
Iowa	Rhode Island
Kentucky	Texas
Louisiana	Vermont
Maine	Washington
Maryland	West Virginia
Massachusetts	Wisconsin
Michigan	

Source: (5).

The exemption of food products from the sales and use tax has been discussed many times in the past in the Common-

wealth. Although the arguments for the exemption of food products are numerous, the primary argument rests on the regressive nature of the sales and use tax. The sales and use tax on food commodities affects households with comparatively low incomes to a much greater extent than households with comparatively high incomes. Typically, low income households spend a greater proportion of their income on food products than high income households (Table 2). Hence, those in favor of exempting food products from the sales and use tax have argued that the exemption would reduce the tax burden for the relatively low income groups.

Table 2. The Relationship Between Household Income and Expenditures for Food: 1972-74

Income Class (dollars)	Food Expenditures as a Percentage of Income
< 5,000	38.88
5,000 to 8,000	23.01
8,000 to 12,000	18.72
12,000 to 15,000	15.75
15,000 to 20,000	14.26
>20,000	10.17

Source: (1).

Out of several alternatives to replace the lost revenue, the Joint Subcommittee recommended that the Commonwealth should gradually eliminate the state sales and use tax on food over a six year period. The Joint Subcommittee proposed that the state sales and use tax on food be reduced by one percent over the next three bienniums. Hence, the Joint Subcommittee recommended a dual tax structure in conjunction with expenditures on food and nonfood items. The purpose of this report is to determine various costs to Virginia food retailers and to determine the sales and use tax savings to consumers with regard to this legislative proposal. The organization of the report is as follows. The assumptions and procedures are discussed in the next section. The results are presented in the second section, and concluding comments follow in the third section.

ASSUMPTIONS AND PROCEDURES

Two general assumptions are made in this report. First, with the incidence of a dual tax structure, the respective food retailers would maintain the same level of service to the consumer as before the adoption of a differential tax structure. This assumption effectively serves to eliminate a form of nonprice competition among food retailers. Second, and tied to the first, with the incidence of a dual tax structure, the incremental costs to the food retailers would necessarily be passed on to consumers in some fashion. Such incremental costs include the following: (a) direct costs (front end labor costs, training costs of personnel), capital costs (cash registers, maintenance, and reprogramming), and management costs; and (b) indirect costs (equipment upgrading, availability of equipment, bookkeeping or accounting problems, and checker bias).

The remainder of this section deals with the procedures used to determine various incremental direct costs and indirect costs attributable to a differential tax structure. To obtain estimates of additional labor costs due to the necessary separation of food items and nonfood items, time-motion studies were carried out with various food retailers: (1) Hop-In (3 stores); (2) Mick-or-Mack (2 stores); (3) Winn-Dixie; (4) Wades; (5) Belo; and (6) Siegel's. These retailers were located in the Southwest region, the Central region, the Tidewater region, and the Eastern region of Virginia.

Retail food dealers fall either into convenience store category (Hop-In), the food store category (Belo, Wades, and Siegel's), or the supermarket category (Winn-Dixie and Mick-or-Mack). Convenience stores are small, compact, self-service stores handling a limited variety of items. The average weekly sales

volume for the convenience store category is less than $40,000. The average weekly sales volume for the food store category is between $40,000 and $100,000, while the average weekly sales volume for the supermarket category is greater than $100,000.

Within each food retailer category, three types of market baskets were processed under the present state of affairs without the incidence of a dual tax structure and then with the incidence of a dual tax structure. The various market baskets included: (1) a low household cost budget market basket; (2) an intermediate household cost budget market basket; and (3) a high household cost budget market basket (Tables 3-8). To formulate such market baskets, for the food store catetory and the supermarket category, Progressive Grocer's guide to the 200 most used supermarket grocery products was employed (3, 4). The expenditure on the low household budget ranged from $40 to $60, the expenditure on the intermediate household budget ranged from $60 to $80, and the expenditure on the high household budget ranged from $80 to $100. In addition, industry figures show that in the average food store and supermarket, 65 to 70 percent of sales are for food items and 30 to 35 percent of sales are for nonfood items (2). Convenience stores normally do not carry fresh produce or meat and derive 60 percent of their sales from six product categories: tobacco, beer, soft drinks, milk, magazines and newspapers, and candy (2).

The processing of the market baskets for the food store category and the supermarket category was repeated three times in each store using three different and experienced cashiers. For the convenience store category, the processing of the market baskets was repeated ten times using one experienced cashier. Some of the goods within the market baskets were eligible for purchase under the WIC Program and the Food Stamp Program.[1] The purpose of such repetitions was to determine the mean market basket processing time both with and without the incidence of a differential tax structure. This statistical measure served to determine the additional labor requirements to process market baskets of goods under a dual tax structure. To obtain the total incremental labor cost, the following calculations for the total number of convenience stores, food stores, and supermarkets were made:

$$\text{Incremental Labor Costs} = (\text{average wage rate/checker})(40\ \text{hrs/wk})(52\ \text{wks})(\text{number of checkers})(\text{additional mean time processing})$$

$$\text{Incremental Training Costs} = (\text{average training cost/checker})(\text{average number of training hours})(\text{number of checkers})$$

To obtain estimates of capital costs such as costs of cash register replacement (through the purchase of new cash registers or scanners) and costs of reprogramming cash registers, a telephone survey with a sample of VFDA headquarter stores throughout the state was conducted. The VFDA membership list of headquarter stores was stratified according to corporations (six in all), retailers - seven or more stores (fifteen in all), and retailers - one to six stores (760 in all).

The total number of headquarter stores from which the sample was drawn was 781. The number of VFDA headquarter stores included in the sample was 123, and the number of responses to the sample was 99 (an 80.5 percent participation rate). For the survey sample, all corporations and all retailers - seven or more stores - were included; in addition, a random sample of 102 out of 760 retailers - one to six stores - was drawn for the telephone survey sample.

The questionnaire used in the telephone survey is exhibited in Figure 1. Approximately 37 percent of the food retailers were familiar with the House Joint Resolution No. 194, while 43 percent were not familiar with the resolution. About 20 percent of the food retailers gave no response concerning their familiarity with the resolution.

Table 3. Low Household Budget Market Basket

Food Items			
Bread	20 oz. loaf	Bacon	12 oz.
Eggs	dz. (Grade A large)	Cheese	12 oz.
Flour	5 lb. bag	Frankfurters and weiners	16 oz.
Milk	1 gallon	Cold cuts (2 types)	8 oz. each
Mayonnaise	32 fl. oz.	Coffee	1 lb.
Sugar	5 lb. bag	Ground beef	1 lb.
Catsup	24 oz.	Chicken (whole)	3 lb.
Mustard	24 oz.	Cookies	12-19 oz.
Breakfast cereal	12 or 15 oz. box	Fresh fruit (2 types)	1 lb. each
Margarine	16 oz.	Canned vegetables (4 types)	16 oz. each
Crackers	16 oz.	Soft drinks	1 carton (8 pack)
Macaroni	16 oz.		
Ice Cream	1/2 gallon		

(24 food items)

Nonfood Items			
Toilet soap	7-14 oz.	Household cleaner	12-22 fl. oz.
Toilet tissue	225 sq. ft.	Kitchen wrap	100 sq. ft.
Laundry detergent	49 oz.	Domestic beer	12 oz. (6 pack)
Paper towels	100 sq. ft.	Cigarettes	1 carton
Dishwashing liquid (not automatic)	22 fl. oz.	Toothpaste	3 oz.

(10 nonfood items)

Source: The authors.

Approximately 65 percent of the food retailers would replace present cash registers (checkouts) with new cash registers or scanners to handle a dual tax structure, while 35 percent would either reprogram their present cash registers to handle a dual tax structure or manually separate the food items from the nonfood items.[2] Almost 45 percent of the food retailers had computerized checkout or scanning operations in their stores, while 50 percent did not have computerized checkout or scanning operations in their stores. Approximately 12 percent of the food retailers had an average weekly dollar volume between $40,000 and $100,000 and 64 percent had an average weekly dollar volume less than $40,000.

To obtain the total incremental capital costs, the following procedure was utilized:

Incremental Cash Register or Scanning Operation Costs = (number of checkouts with new cash registers or scanning operations) (average cost of cash register or scanning operation to handle a dual tax structure--trade-in value of previous cash registers)

Incremental Reprogramming Costs = (number of checkouts with reprogramming) (average cost of reprogramming cash register)

Table 4. Intermediate Household Budget Market Basket

Food Items

Bread	20 oz. loaf	Frozen vegetables (4 types)	10 oz. each
Eggs	dozen (Grade A large)	Ground beef	1 lb.
Flour	5 lb. bag	Chicken (whole)	3 lb.
Milk	1 gallon	Salad dressing	8 fl. oz.
Mayonnaise	32 fl. oz.	Pork chops	2 lbs.
Sugar	5 lb. bag	Frozen fish or seafood	14-24 oz.
Catsup	24 oz.	Soft drinks	1 carton (8 pack)
Mustard	24 oz.	Tea	8 oz. (100 bags)
Breakfast cereal	12 or 15 oz. box	Cookies	12-19 oz.
Margarine	16 oz.	Tuna (2 cans)	6-7 oz.
Ice Cream	1/2 oz.	Fresh fruit (3 types)	1 lb. each
Bacon	12 oz.	Orange juice (frozen)	6 fl. oz.(6 pack)
Cheese	12 oz.	Jams and jellies	18-32 fl. oz.
Coffee	12 oz.	Frozen pies, cakes, pastries	26-46 oz.
Soup (4 cans)	10 or 11 oz. each		

29 Food Items

Nonfood Items

Toilet soap	7-14 oz.	Garbage bags	10 or 20 bags
Toilet tissue	225 sq. ft.	Domestic beer	12 oz. (6 pack)
Laundry detergent	49 oz.	In-Tank toilet bowl cleaner	12 oz.
Aluminum foil	75 sq. ft.	Floor wax & polish	32 fl. oz.
Paper towels	100 sq. ft.	Deodorant	2-3 oz.
Dishwashing liquid (not automatic)	22 fl. oz.	Shampoo	3-12 oz.
Household cleaner	12-22 fl. oz.	Toothpaste	3 oz.
Aspirin	24 or 30 tablets		

15 Nonfood Items

Source: The authors.

$$\text{Incremental Maintenance Costs} = \text{(number of checkouts) (average maintenance cost)}$$

The incremental cash register or scanning operation costs and the incremental reprogramming costs were then amortized.

This report, however, makes no estimates of management costs or indirect costs attributable to the differential tax structure. In short then, this report underestimates the total costs to the Virginia food retailers. To complete the objectives of this study, estimates of the loss of state sales and use tax revenue due to a dual tax structure were obtained using historical data from the Virginia Department of Taxation.

RESULTS

To compute the direct costs to the food retailers in Virginia due to the

Table 5. High Household Budget Market Basket

Food Items

Bread	20 oz. loaf	Soft drinks	1 carton (8 pack)
Eggs	dozen (Grade A large)	Drink mixes	30-33 oz.
Flour	5 lb. bag	Fresh fruit (3 types)	1 lb. each
Milk	1 gallon	Frozen vegetables (4 types)	10 oz. each
Mayonnaise	32 fl. oz.	Spaghetti	16 oz.
Sugar	5 lb. bag	Spaghetti sauce	16 oz.
Catsup	24 oz.	Peanut butter	28 oz.
Mustard	24 oz.	Crackers	16 oz.
Breakfast cereal	12 or 15 oz. box	Cookies	12-19 oz.
Butter	16 oz.	Nuts	12-18 oz.
Ice cream	1/2 gallon	Orange juice (frozen)	6 fl. oz. (6 pack)
Bacon	12 oz.	Yogurt	8 oz.
Cheese	12 oz.	Candy bars	6-12 oz.
Coffee	1 lb.	Cake mix	18.5 oz.
T-bone steak	1 lb.	Potato chips	7-8 oz.
Ground beef	1 lb.	Dips, ready-to-serve	8 oz.
Chuck roast	3 lb.		
Canned ham	48 oz.		

34 Food Items

Nonfood Items

Toilet soap	7-14 oz.	Aspirin	24 or 30 tablets
Toilet tissue	225 sq. ft.	Garbage bags	10 or 20 bags
Laundry detergent	49 oz.	Kitchen wrap	100 sq. ft.
Paper towels	100 sq. ft.	Mouthwash	6 oz.
Household cleaner	12-22 fl. oz.	Furniture polish	14 oz.
Domestic beer	12 oz. (6 pack)	Dishwashing liquid (automatic)	50 oz.
Wine	25.4 fl. oz.	Rug cleaner	24 oz.
Deodorant	2-3 oz.	Dog food	36 oz.
Shampoo	3-12 oz.	Air fresheners	5-9 oz.
Toothpaste	3 oz.		

19 Nonfood Items

Source: The authors.

incidence of a dual tax structure, information about the retail food industry was obtained from several sources. The information obtained is summarized by source in Table 9. From the time motion studies, the average percentage increase attributable to the incidence of a dual tax structure in mean time processing of the market baskets of goods for the sample stores utilizing present equipment was 25 percent to 33 percent (Table 10). The percentage increases in mean time processing of the market baskets for the various stores spanned a wide range, from approximately 12 to 70 percent. Furthermore, for each store and for each type of market basket, the difference in mean time processing with

Table 6. Convenience Store, Low Market Basket, 4 items each

(1)	2 packs of cigarettes, milk (quart), 2 candy bars, newspaper
(2)	2 packs of cigarettes, carton of soft drinks, newspaper, dozen eggs
(3)	Six-pack beer, magazine, bread (loaf), breakfast cereal
(4)	Cheese, eggs, toothpaste, dishwashing liquid
(5)	Cookies, paper towels, household cleaner, margarine
(6)	Pet food, carton of soft drinks, aspirin, bread (loaf)
(7)	Deodorant, mouthwash, ice cream, bacon
(8)	Orange juice, coffee, dishwashing liquid, furniture polish
(9)	Bread, pet food, paper towels, tea
(10)	2 cans soup, eggs, shampoo, kitchen wrap

Source: The authors.

Table 7. Convenience Store, Intermediate Market Basket, 7 items each

(1)	Newspaper, bread, mustard, flour, kitchen wrap, one carton soft drinks, pet food
(2)	2 packs of cigarettes, eggs, potato chips, catsup, toothpaste, milk, coffee
(3)	Magazine, breakfast cereal, crackers, bread, shampoo, paper towels, sugar
(4)	Toothpaste, dishwashing liquid, milk, tea, catsup, beer, pet food
(5)	Cookies, household cleaner, eggs, flour, wine, magazine, orange juice
(6)	Aspirin, bread, aluminum foil, mayonnaise, potato chips, beer, milk
(7)	Flour, yogurt, wine, eggs, newspaper, bacon, mouthwash
(8)	Coffee, furniture polish, cheese, cake mix, magazine, soft drinks, cookies
(9)	Tea, bread, pet food, paper towels, mayonnaise, catsup, peanut butter
(10)	Drink mixes, wine, newspaper, flour, kitchen wrap, milk, eggs

Source: The authors.

and without the incidence of a differential tax structure was statistically significant at any reasonable level of significance. The statistical test employed was the paired t-test.

The computation of the direct costs to the food retailers attributable to a dual tax structure still depends in part on various possibilities concerning the employment of labor and capital. The number of possibilities is vast. This report analyzes four possibilities: (1) the food retailers employ additional labor and no new capital equipment; (2) the food retailers either purchase new cash registers or reporgram present cash registers; (3) all food retailers in supermarkets adopt scanning installations, and the food retailers in food stores and convenience stores either purchase new cash registers or reprogram present cash registers; and (4) 5 to 10 percent of the supermarkets adopt scanning installations, 5 to 10 percent of the food stores and convenience stores use additional labor only, while the rest of the stores either purchase new cash registers or reprogram present cash registers. Thus, possibility 1 represents the use of labor only, possibilities 2 and 3 represent the use of capital only, and possibility 4 represents more of a mix of the use of labor and capital.

The results of the calculations for these four possibilities are shown in Tables 11-14. Since the state sales and use tax on food would not be reduced by one percent until July 1, 1981 at the earliest, the annual direct costs to the food retailers were projected over the

Table 8. Convenience Store, High Market Basket, 10 items each

(1)	2 packs cigarettes, milk, 2 candy bars, newspaper, loaf of bread, mustard, flour, kitchen wrap, soft drinks, pet food
(2)	2 packs cigarettes, soft drinks, newspaper, eggs, potato chips, catsup, toothpaste, milk, coffee, bacon
(3)	Beer, magazine, bread, breakfast cereal, crackers, margarine, sugar, eggs, paper towels, shampoo
(4)	Cheese, eggs, toothpaste, dishwashing liquid, milk, tea, catsup, beer, newspaper, pet food
(5)	Cookies, paper towels, household cleaner, margarine, eggs, flour, sugar, wine, newspaper, orange juice
(6)	Pet food, soft drinks, aspirin, bread, aluminum foil, mayonnaise, potato chips, beer, milk, magazine
(7)	Deodorant, mouthwash, ice cream, bacon, milk, flour, yogurt, wine, eggs, newspaper
(8)	Orange juice, coffee, dishwashing liquid, furniture polish, cheese, cake mix, magazine, soft drinks, cookies
(9)	Bread, pet food, paper towels, tea, catsup, mayonnaise, peanut butter, beer, eggs, magazine
(10)	2 cans soup, eggs, drink mixes, kitchen wrap, shampoo, flour, wine, milk, newspaper, coffee

Source: The authors.

period 1981 to 1986. Each of the incremental costs were initially computed in 1980 dollars and then multiplied by a factor of 1.0727 to derive the costs in 1981. This factor represents the 7.27 percent average annual growth in the Consumer Price Index from 1970-1979.

Training costs were assumed to occur in the first time period (1981) only. Of course, this assumption is not strictly tenable due to turnover in store checkers. However, the incremental training costs in later periods would likely be minimal. Labor costs and maintenance costs for successive years were derived by multiplying the costs in the preceding time period by the factor 1.0727. The costs of cash register purchases, the costs of scanner purchases, and the costs of reprogramming were amortized over a six-year period (the length of and depreciation of the capital equipment) using interest rates of both 15 and 20 percent.

For possibility 1, the costs to the food retailers in the first biennium ranged from $40.7 million to $103.1 million in the second biennium ranged from $46.0 million to $118.6 million, and in the third biennium ranged from $52.9 million to $136.4 million. Such costs depended, to a large measure, on the average wage rate per checker ($4.92/hour to $8.80/hour). Over the six-year period, the range of per capita costs was $7.65 to $24.09. For possibilities 2 and 3, the costs to the food retailers in each of the bienniums were substantially less than for possibility 1. Over the six-year period, the interval for the per capita costs was $1.27 to $4.11. The costs for the fourth possibility fell into the same range as the costs for the second and third possibilities.

In brief, the direct costs to the food retailers would vary considerably depending on the mix of capital and labor utilized to meet the additional work required if a dual tax structure were enacted. The costs shown represent conservative estimates since the calculations omitted management costs and indirect costs such as equipment upgrading, availability of equipment,

Figure 1. Telephone Survey to Virginia Food Dealers

FOR REFERENCE PURPOSES ONLY

Name of VFDA Members: _____

Address: _____

Store Name: _____ Telephone No. _____

QUESTIONNAIRE

1. Are you familiar with the resolution in the Virginia State Legislature which calls for the gradual reduction of the sales tax on food to one percent?

_____ Yes _____ No _____ Uncertain

2. Assume that the tax resolution becomes law (that is, a 4 percent tax on nonfood items and eventually a one percent tax on food items), are your present cash registers capable of computing the entire transaction and giving the customer only one sales receipt?

_____ Yes _____ No _____ Uncertain

If the answer to question 2 is no or uncertain:

3. (a) Assuming again the tax resolution becomes law, would you purchase outright new cash registers or modify your present cash registers to handle the dual tax structure and to present the customer with only one sales receipt?

Purchase outright new cash registers _____
Modify present cash registers _____

(b) What modifications in the present cash registers would be made to handle the dual tax structure?

4. What type of front-end equipment (cash registers, check stand) do you now have in your store(s)?

5. How many cash registers and checkouts do you have in your store(s)?

6. Do you presently have computerized checkout or scanning operations in your store(s)?

_____ Yes _____ No _____ Uncertain

7. Which of the following sales categories adequately describes the average weekly dollar volume in your store(s)?

_____ > $100,000/week _____ $40,000-$100,000/week _____ < $40,000/week

Table 9. Information About the Virginia Retail Food Industry Used to Make Computations (as of 1980)

Number of stores[a]	4,901
Number of supermarkets[b] (13.6%)	667
Number of food stores[b] (73.1%)	3,583
Number of convenience stores[b] (13.3%)	652
Average number of checkouts/supermarket[b]	6.93
Average number of checkouts/food store[b]	2.20
Average number of checkouts/convenience store[b]	2.20
Weighted average number of checkouts/store[e]	2.84
Number of checkouts in supermarkets[e]	4,621
Number of checkouts in food stores[e]	7,882
Number of checkouts in convenience stores[e]	1,434
Total number of checkouts	13,937
Number of stores with scanning installations (1.8%)[a]	90
Number of checkouts with scanning operations[e]	624
Average wage rate/checker[a]	$4.92/hr. to $8.80/hr.
Number of checkers[e]	13,937
Average training costs/checker[a]	$6.50/hr. to $7.00/hr.
Average number of training hours[a]	8
Average purchase price of cash register to handle multiple tax rates[c]	$2,195
Average trade-in value of present cash registers[c]	$ 150
Average length of life and depreciation of cash registers[c]	5 to 7 years
Average purchase price of scanning installation[d]	$9,000 to $10,000
Average maintenance costs of capital equipment[c]	$175 to $220
Average reprogramming costs[c] (reprogramming of software equipment with the ability to handle dual tax structure)	$200 to $500
Amortization schedule[e]	6 years
Nominal annual interest rate[e]	15% to 20%
Number of stores not sophisticated enough to handle dual tax structure[e]	2,284 to 3,186
Number of stores sophisticated enough to handle dual tax structure[e]	1,175 to 2,617
Number of checkouts with new capital equipment to handle dual tax structure[e]	6,495 to 9,059
Number of checkouts with reprogramming or other modifications to handle dual tax structure[e]	4,878 to 7,442
Average percentage in mean time processing market baskets of goods due to the separation of nonfood items from food items[e]	24.80% to 33.34%

[a] Information from the Food Marketing Institute (FMI).

[b] Information from (3).

[c] Information from J Cash Registers, Inc.

[d] Information from the National Association of Retail Grocers (NARGUS).

[e] Computations by the authors.

Table 10. Percentage Increase in Mean Time Processing of the Market Baskets for Each Store

Store	Market Basket	Percentage Change in Mean Time Processing	
		Without Adjustment for Learning	With Adjustment for Learning[a]
Hop-In Store #1	Low	52.20	70.72
	Intermediate	34.46	44.80
	High	18.50	25.12
	Overall	31.61	42.32
Hop-In Store #2	Low	39.52	53.54
	Intermediate	26.08	33.90
	High	28.62	38.86
	Overall	30.56	40.99
Hop-In Store #3	Low	21.28	28.83
	Intermediate	21.64	28.13
	High	23.33	31.68
	Overall	22.30	29.80
Mick-or-Mack Store #1	Low	45.95	62.25
	Intermediate	37.43	48.66
	High	42.21	57.31
	Overall	41.45	55.44
Mick-or-Mack Store #2	Low	9.18	12.44
	Intermediate	11.94	15.52
	High	8.98	12.19
	Overall	9.77	13.53
Wades	Low	43.94	59.53
	Intermediate	40.91	53.18
	High	21.09	28.64
	Overall	33.66	44.55
Belo	Low	20.87	28.27
	Intermediate	9.36	12.17
	High	29.95	40.67
	Overall	20.50	27.95
Siegel's	Low	18.28	24.77
	Intermediate	17.04	22.15
	High	11.49	15.60
	Overall	15.20	20.80

[a]Due to the design of the time-motion study for each store, some learning (memorization of prices, familiarity of products and procedures) on the part of the cashiers was inherent. To account for the learning process, the following estimates of the degree of learning were developed: (1) 35.48%/low market basket; (2) 30%/intermediate; (3) 35.78%/high. Percentage changes were adjusted to account for the learning process.

Table 11. Possibility 1: The Food Retailers Employ Additional Labor and No New Capital Equipment (in millions of dollars)

Incremental Costs	1981	1982	1983	1984	1985	1986
Training Costs	0.74 - 0.80	--	--	--	--	--
Maintenance Costs[a]	0.12 - 0.15	0.13 - 0.16	0.13 - 0.17	0.14 - 0.18	0.16 - 0.19	0.17 - 0.21
Labor Costs	39.85[b]- 95.86[c]	42.75[b]-102.83[c]	45.86[b]-110.31[c]	49.19[b]-118.33[c]	52.77[b]-126.93[c]	56.61[b]-136.16[c]
Reprogramming Costs of Scanners[a]	0.04 - 0.10	0.04 - 0.10	0.04 - 0.10	0.04 - 0.10	0.04 - 0.10	0.04 - 0.10
Total Costs	40.75 - 96.91	42.91 -103.09	46.03 -110.58	49.37 -118.61	52.96 -127.23	56.81 -136.47
Total Costs on a Per Capita Basis	$7.65 -$18.19	$7.96 -$19.12	$8.43 -$20.25	$8.93 -$21.46	$9.46 -$22.74	$10.03 -$24.09

[a]Attributable to the 624 checkouts already with scanning installations.

[b]At $4.92/hour wage rate.

[c]At $8.80/hour wage rate.

Source: Computation by the authors.

Table 12. Possibility 2: The Food Retailers Either Purchase New Cash Registers or Reprogram Present Cash Registers (in millions of dollars)

Incremental Costs	1981	1982	1983	1984	1985	1986
Costs of Cash Register Purchases	3.76- 5.98	3.76- 5.98	3.76- 5.98	3.76- 5.98	3.76- 5.98	3.76- 5.98
Reprogramming Costs	0.28- 1.20	0.28- 1.20	0.28- 1.20	0.28- 1.20	0.28- 1.20	0.28- 1.20
Maintenance Costs	2.62- 3.29	2.81- 3.53	3.01- 3.78	3.23- 4.06	3.46- 4.35	3.72- 4.67
Training Costs	0.74- 0.80	--	--	--	--	--
Total Costs	7.40-11.26	6.85-10.70	7.05-10.96	7.27-11.24	7.51-11.53	7.76-11.85
Total Costs on a Per Capita Basis	$1.39-$2.11	$1.27-$1.98	$1.29-$2.01	$1.32-$2.03	$1.34-$2.06	$1.37-$2.09

Source: Computation by the authors.

Table 13. Possibility 3: The Food Retailers in Supermarkets Adopt Scanning Installations, and the Food Retailers in Food Stores and Convenience Stores Either Purchase New Cash Registers or Reprogram Present Cash Registers (in millions of dollars)

Incremental Costs	1981	1982	1983	1984	1985	1986
Costs of Scanner Purchases	10.20-12.90	10.20-12.90	10.20-12.90	10.20-12.90	10.20-12.90	10.20-12.90
Costs of Cash Register Purchases	2.52- 3.99	2.52- 3.99	2.52- 3.99	2.52- 3.99	2.52- 3.99	2.52- 3.99
Reprogramming Costs	0.22- 0.90	0.22- 0.90	0.22- 0.90	0.22- 0.90	0.22- 0.90	0.22- 0.90
Maintenance Costs	2.62- 3.29	2.81- 3.53	3.01- 3.78	3.23- 4.06	3.46- 4.35	3.72- 4.67
Training Costs	0.74- 0.80	--	--	--	--	--
Total Costs	16.29-21.88	15.74-21.32	15.95-21.58	16.16-21.85	16.40-22.15	16.65-22.46
Total Costs on a Per Capita Basis	$3.06-$4.11	$2.92-$3.95	$2.92-$3.95	$2.92-$3.95	$2.93-$3.96	$2.94-$3.97

Source: Computation by the authors.

Table 14. Possibility 4: Five to Ten Percent of Supermarkets Adopt Scanning Installations, Five to Ten Percent of Food Stores, Convenience Stores Use Additional Labor Only, the Rest of the Stores Either Purchase New Cash Registers or Reprogram Present Cash Registers (in millions of dollars)

Incremental Costs	1981	1982	1983	1984	1985	1986
Costs of Scanner Purchases	0.51- 1.29	0.51- 1.29	0.51- 1.29	0.51- 1.29	0.51- 1.29	0.51- 1.29
Costs of Cash Register Purchases	3.24- 5.42	3.24- 5.42	3.24- 5.42	3.24- 5.42	3.24- 5.42	3.24- 5.42
Reprogramming Costs	0.29- 1.13	0.29- 1.13	0.29- 1.13	0.29- 1.13	0.29- 1.13	0.29- 1.13
Labor Costs	1.40- 6.71	1.50- 7.20	1.61- 7.72	1.72- 8.28	1.85- 8.89	1.98- 9.53
Maintenance Costs	2.44- 3.18	2.62- 3.41	2.81- 3.66	3.01- 3.92	3.23- 4.21	3.47- 4.52
Training Costs	0.74- 0.80	--	--	--	--	--
Total Costs	8.61-18.54	8.15-18.46	8.45-19.23	8.77-20.05	9.11-20.94	9.48-21.89
Total Costs on a Per Capita Basis	$1.62-$3.48	$1.51-$3.42	$1.55-$3.52	$1.59-$3.63	$1.63-$3.74	$1.67-$3.86

Source: Computation by the authors.

additional bookkeeping, and checker bias. In the event of the introduction of a differential tax structure, in all probability during 1981-1982, the labor intensive possibility would well represent the typical costs to Virginia food retailers. Innovation in the substitution of capital for labor generally occurs only after some lag in time. The costs to the food retailers for the period 1983-1986 probably would be characterized by the more capital intensive possibilities. After some passage of time, the incidence of a dual tax structure might motivate food retailers to adopt new capital equipment more quickly in efforts to minimize costs.

Projections of loss of state and local sales and use tax revenue and per capita sales and use tax savings to consumers are exhibited in Table 15. Population projections, used in Tables 11-14, to derive total costs on a per capita basis, were based on the 1.24 percent annual average population growth in Virginia from 1970 to 1979. State sales and use tax projections were based on the 11.23 percent annual average state and use tax growth in Virginia from 1970 to 1979.

The largest major source of sales and use tax revenue is the food group of the business classification code.[3] The food group comprised on the average 32.62 percent of the total sales and use tax revenue from the fourth quarter of 1966 to the second quarter of 1980. However, since grocery stores sell a wide variety of nonfood items, the figures for state sales and use tax for food overestimated the amount of food products for home consumption directly subject to the tax. In the typical store (food store, supermarekt, or convenience store) 65 to 70 percent of sales are for food items, while 30 to 35 percent of sales are for nonfood items. Since the grocery component of the food group constitutes by far the most sizeable share of the nine components, 21.2 to 22.8 percent of the total sales and use tax base estimates would be the amount directly subject to the food tax. The estimated loss of state sales and use tax revenue ranged from $35.8 million to $197.0 million during the period 1981 to 1986. The estimated per capita state sales and use tax savings to consumers ranged from $6.72 to $34.78 over the six-year period. The revenue losses implicitly assume that the Commonwealth would continue to distribute one-third of the state revenue back to localities as if it were collected. If this assumption were untenable, the estimated loss of local sales and use tax revenue would be $11.9 million to $65.7 million over the period 1981 to 1986.

CONCLUDING COMMENTS

The estimated loss of state sales and use tax revenue attributable to House Joint Resolution No. 194 would range from $35 million in 1981 to almost $200 million by 1986. This loss would be a tax savings to consumers, however, only if the Commonwealth did not attempt to recover the lost revenue by raising individual income taxes, corporate income taxes, property taxes, or other taxes. In all probability, these various taxes would be increased due to the magnitude of the sales and use tax and the progressive nature of income taxes, property taxes, and other taxes, state income would be distributed away from middle and high income households to low income households. The food retailers, regardless of whether or not the Commonwealth attempted to recoup the lost revenue, due to the incidence of a dual tax structure would incur sizeable incremental costs depending on the mix of labor and capital utilized. To maintain profit margins, such costs are typically passed on to all consumers in the form of price increases. The tax savings to consumers then would be offset not only by the recoupment of the lost revenue by the government at the state or local level but also by the incremental costs incurred by the food retailers. Thus, the proposed legislation to gradually reduce the state sales and use tax on food by one percent over the next three bienniums would not

Table 15. Projections of Loss of State and Local Sales and Use Tax Revenue and Per Capita Sales and Use Tax Savings to Consumers

	1981	1982	1983	1984	1985	1986
Population[a] (million)	5.33	5.39	5.46	5.53	5.60	5.76
State Sales and Use Tax[b] (million $)	675.58	751.47	835.88	929.78	1,034.23	1,150.41
State Sales and Use Tax for Food[c] (million $)	220.37	245.13	272.67	303.29	337.37	375.26
Loss of State Sales and Use Tax Revenue[d] (million $)	35.81-	39.83-	88.62-	98.57-	164.46-	182.94-
(tax savings to consumers)	38.57	42.90	95.43	106.15	177.12	197.01
Loss of Local Sales and Use Tax Revenue[e] (million $)	11.94-	13.28-	29.54-	32.86-	54.82-	60.98-
(tax savings to consumers)	12.86	14.30	31.81	35.38	59.04	65.67
Per Capita State Sales and Use Tax Savings to Consumers	$6.72-	$7.39-	$16.23-	$17.38-	$29.39-	$32.29-
	$7.24	$7.95	$17.48	$19.21	$31.65	$34.78

[a]Projections based on 1.24 percent annual average population growth in Virginia from 1970-1979 (Tayloe Murphy Institute).

[b]Projections based on 11.23 percent annual average state sales and use tax growth in Virginia from 1970-1979 (Virginia Department of Taxation).

[c].3262 x state sales and use tax.

[d].21203 x state sales and use tax to .22834 x state sales and use tax.

[e](Loss of state sales and use revenue)/3.

Source: Computation by the authors.

result in a net addition to the disposable incomes of Virginia consumers.

FOOTNOTES

[1]The Food Stamp Program (FSP) is designed to help low income households buy a more nutritious diet. Under the program, participants use stamps to buy food through regular market channels. The FSP, made part of permanent legislation by the Food Stamp Act of 1964, is the largest domestic food assistance program in terms of total program benefits. The Special Supplemental Food Program for Women, Infants, and Children (WIC) is the most recent food assistance program. Created in 1972, this program provides supplemental food purchasing power to women and infants, through vouchers valid only for foods specified as highly nutritious.

[2]To minimize the manual sorting of products, the necessary capabilities of the electronic point-of-sale equipment are: (1) two programmable tax rates or the ability to automatically compute two different tax percentages on different items; and (2) food stamp and nonfood stamp departments.

[3]The categories of the retail sales and use tax business classification code are the following: (1) food; (2) general merchandise; (3) lumber, building material, and supplies; (4) automotive; (5) furniture, home furnishings, and equipment; (6) machinery, equipment, and supplies; (7) fuel; (8) apparel; and (9) miscellaneous.

REFERENCES

(1) Food Prices in Perspective, U.S. Department of Agriculture, ESCS, Agriculture Information Bulletin No. 427.

(2) Marion, B. W.; Muller, W. F; Cotterill, R. W.; Geithman, F. E. and J. R. Schmelzer, The Food Retailing Industry: Market Structure, Profits and Prices, Praeger Publishers, New York, 1979.

(3) Progressive Grocer, August 1980, pp. 44-45.

(4) Progressive Grocer's Marketing Guidebook, Published by the Progressive Grocer Company, 1979.

(5) Report of the Joint Subcommittee Studying Equitable Revenue Sources to Replace the Revenue from the Sales Tax on Food, House Document No. 11, Commonwealth of Virginia, Richmond, Virginia, 1980.

(6) Virginia Department of Taxation, Quarterly Report, 1966-1980.