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THE VALUE ADDED TAX: A PRELIMINARY LOOK AT EFFECTS ON THE AGRICULTURAL SECTOR*

J. B. Penn, G. D. Irwin, and R. A. Richardson

Discussion of the possibility of a value added tax (VAT) has recently become a lively topic for the press, public, and politicians. The President's 1970 Task Force on Business Taxation recommended that the tax not be imposed immediately, but that the possibility of using the VAT in the future be given more exposure and discussion. A number of states have also considered enacting a VAT, and a few have done so.

Several forms of the VAT have been proposed[1] as an additional general revenue source or as a total or partial replacement for the Corporate Income Tax (CIT), or more recently as a part of general tax restructuring. In view of burgeoning revenue needs of both local and federal governments, and of important potential effects for agriculture, the VAT issue deserves our serious analysis.

Since the subject hasn't received much attention by agricultural economists, this paper concentrates on establishing basic statistical facts relevant to determining sector and intra-sector effects.[2] Three distinct categories of effects might be expected: on capital intensity, on tax liability, and on production efficiency. Because of space limitations, we must neglect aggregate price level and export-import considerations in this paper.[3]

We begin by briefly indicating the nature of VAT, and then we examine each of the effects by assembling and presenting input-output, tax, and other data. Our intent is to make initial comparisons of agriculture with other sectors and to examine subsectors within agriculture. Due to the kinds of data available, comparisons are on the production sector basis, rather than on individuals called farmers or businesses called farms.

THE NATURE OF VALUE ADDED

In general, value added by any firm is the difference between returns from its sales and the cost of goods and services it purchases from other firms or individuals. Hired labor would be deductible as a cost, but owner labor would not.

Four alternative general tax bases have been proposed, differing in the capital cost items which may be deducted in computing value added. Utilizing macro symbolism and accounting identities, the various forms of VAT may be shown.[4] For a closed

J. B. Penn and G. D. Irwin are agricultural economists with the Farm Production Economics Division, Economic Research Service, USDA stationed at Purdue University, Lafeyette. R. A. Richardson is a research assistant in agricultural economics at Purdue University.

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[1] Krauss and O'Brien [3] point out that the term "value-added tax" refers to a method of tax collection at each production stage, not to a particular tax. As a device for levying taxes, it may take the form of any one of several more familiar types of tax. The gross product type is the counterpart of a general sales tax, the income type resembles an income tax on production, and a consumption type is similar to a tax on all consumption goods. Since the point of tax imposition differs, whether the pairs are identical in effect depends upon tax shifting parameters.

[2] For a description of the nature and background of value added taxation, see Sullivan [7].

[3] See Aaron [1] and Krauss and O'Brien [3]. Net export data are included in Tables 1 and 3 for reference only.

[4] Micro approaches utilizing tax accounting rather than social accounting relationships might also be used to show these relationships, and would be used in preparing taxpayer instructions, but the current form is more amenable to examining aggregate impacts.

economy, gross national product (GNP) is identically equal to consumption (C) plus gross investment (I) plus government expenditures (G). GNP is also equal to factor payments (P) plus corporate retaining earnings (R)[5] plus indirect taxes (T) plus depreciation (D). GNP is also equal to gross domestic output (GDO) of all firms less each firm's purchased intermediate inputs (F). These relations may be summarized as:

(1) $GDO = GNP + F$
(2) $GNP = C + I + G$
(3) $GNP = P + R + T + D$

From these relations (and defining E as capital earnings on owned capital stock) the four types of value added bases may be shown as below.[6]

Gross product type:[7]

$$VA_g = GDO - F = GNP = C + I + G.$$

Income type:

$$VA_i = GDO - T - F - D = GNP - T - D = C + I + G - T - D.$$

Consumption type:

$$VA_c = GDO - F - I = GNP - I = C + G.$$

Wages type:

$$VA_w = GDO - F - E = GNP - E = C + I + G - E.$$

THE VAT AND CAPITAL INTENSITY

The relationship between VAT and capital intensity is two-way. First, the type of VAT adopted determines the kind of capital costs deductible in determining the tax base. Thus, the type may affect capital intensity decisions on new installations. The gross product type discourages capital and favors labor. It permits no capital charges at all. On the other hand, the consumption type allows full cost of capital items to be deducted in year of purchase. This obviously encourages intensification. Between the two, the income type allows depreciation charges and the wages type permits deduction of capital earnings from the gross value before tax is calculated. The net effects would depend on depreciation rates and on methods of determining capital earnings. Second, choice of form of VAT could result in difference in relative amounts of tax owed between agriculture and other sectors, as well as between sectors of agriculture. Existing capital intensities, annual capital expenditures and ratios of value added to total sales would point to these impacts.

It is thus apparent that capital intensity decisions would be affected most in industries whose annual capital purchases pattern was least favored by the particular form of VAT. So we need to have basic information on these patterns. At the same time, the form also affects current tax liabilities. To get a very rough notion of the different VAT effects, aggregate data from several sources were used to compute the value added base for three of the four types of VAT. Data were not readily available in usable form to compute the base for the wages type VAT. These calculations are shown by sectors as well as for subsectors in agriculture in Tables 1, 2 and 3. They assume a closed economy and are adjusted to eliminate government purchases (footnote 6).

From these data several distinctive aspects of agriculture may be noted.

1. Gross receipts are not an indicator of value added. Value added as a percentage of gross receipts (Table 2, cols. 7-9), is low in agriculture and manufacturing and high in wholesale and retail trade and finance. Within agriculture, percentages are low for livestock and about average for crop farms.
2. Agriculture is a relatively capital intensive sector, and also has relatively short-lived capital. These mean that the capital deductions allowable under various forms of VAT are of great importance.
3. Consequently, agriculture's proportion of the total tax base is highest under the gross product VAT, 4.74 percent, and successively decreases to 4.28 and 4.15 for the income and consumption types, respectively. The type of VAT chosen is thus quite important to agriculture as well as to other sectors. Agriculture's base is lowest for the consumption VAT, which is the one reported to be under consideration by the Treasury Department.

Because of the different structure of the various sectors, not all are affected alike. Unlike

[5] In national income and product accounting, the sum of factor payments and corporate retaining earnings is defined as value added. It is but one of the four possible bases for a value added tax. Specific capital deductions allowable under the various bases are difficult to define, particularly in finance and service industries.

[6] Inclusion of government expenditures (G) merely raises the cost of the government of taxed purchases and is in effect paying a tax to itself. Thus, G is effectively excluded.

[7] This is the definition of value added used in the U.S. Dept. of Commerce input-output tables. Logically, the components may be broken into wages and salaries, indirect business taxes, depreciation, and net property income. Such estimates are not yet available.

Table 1. VALUE ADDED TAX BASE FOR ALTERNATIVE FORMS OF VAT, 1963, CLOSED ECONOMY BASIS.

Sector	Value added tax base: Gross Product VA_g	Value added tax base: Income VA_i	Consumption VA_c	Gross Receipts (GDO)	Indirect Taxes (T)	Depreciation (D)	Gross Investment (I)	Purchased Intermediate Inputs (F)	Federal Government Purchase (G)	Net Exports
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					million dollars					
Agriculture, forestry and fisheries	22,944	17,674	17,798	57,473	1,328	3,841	5,146	34,772	-242	3,012
Mining	10,762	9,349	7,131	20,570	402	1,011	3,631	9,519	289	536
Construction	31,597	29,019	28,737	85,313	1,159	1,419	2,860	48,292	5,424	2
Manufacturing	145,918	119,479	133,622	466,415	13,037	13,402	12,296	295,444	25,053	16,413
Trade	87,680	78,135	80,919	120,613	5,442	4,143	6,801	32,165	728	1,735
Transportation, communications, utility services	48,543	35,455	36,082	84,678	5,173	7,915	12,461	34,210	1,925	3,141
Finance, insurance and real estate	79,937	72,535	76,525	117,587	3,917	3,485	2,412[b]	37,451	199	434
Services	57,073	51,429	47,556	103,038	1,733	3,911	9,517	42,079	3,886	548
Total tax base[a]	484,494	413,175	428,370	1,055,687	32,191	39,127	55,124	533,932	37,262 [c]	25,821 [c]

[a]Totals may not add due to small amounts not allocated to sectors in source data.

[b]Exludes $25,843 million private residential construction in original data.

[c]From private domestic sectors.

Source: Cols. 1-3 calculated from data in cols. 4-8; cols. 4, 8, 9, 10 from [5] and [6]; cols. 5 and 6 from [8] tables I, J and K; col. 7 from [7].

Table 2. PERCENT OF TOTAL BASE, PERCENT CHANGE IN BASE AND VALUE ADDED AS A PERCENT OF GROSS RECEIPTS, BY SECTORS AND TYPES OF VAT, U.S., 1963, CLOSED ECONOMY BASIS.

Sectors	Sector share of total base: Gross Product	Sector share of total base: Income	Sector share of total base: Consumption	Change in sector's base: GP to Income	Change in sector's base: GP to Consumption	Change in sector's base: Income to Consumption	Base as a share of gross receipts: Gross Product	Base as a share of gross receipts: Income	Base as a share of gross receipts: Consumption
					Percent				
Agriculture	4.74	4.28	4.15	-23.0	-22.4	+0.7	39.9	30.8	31.0
Mining	2.22	2.26	1.66	-13.1	-33.7	-23.7	52.3	45.4	34.7
Construction	6.52	7.02	6.71	-8.2	-9.1	-1.0	37.0	34.0	33.7
Manufacturing	30.12	28.91	31.19	-18.2	-8.4	+11.8	31.3	25.6	28.6
Trade	18.10	18.91	18.89	-10.9	-7.1	+3.6	72.2	64.8	67.1
Transportation, communication, utilities	10.02	8.58	8.42	-27.0	-25.7	+1.8	57.3	41.9	42.6
Finance	16.50	17.55	17.86	-9.3	-4.0	+5.5	68.0	61.7	65.1
Services	11.78	12.44	11.10	-9.9	-16.7	-7.5	55.4	49.9	46.2
8 Sectors	100.00	100.00	100.00	-14.7	-11.6	+3.7	45.9	39.1	40.6

the agricultural sector, the manufacturing and finance sector bases increase for the consumption VAT as opposed to the income VAT. Thus, there would not be unanimous agreement among sectors as to type of VAT base preferred.

4. Within the agricultural sector, the subsectors are likely to be affected differently (Table 3). Generally, the crop production subsectors have heavier annual capital investment and depreciation than livestock subsectors. Thus the choice of a form of VAT base is of more importance to them. In addition, under all three forms the base from crops is more than twice that for livestock. These results contrast starkly with rankings based on gross receipts (Table 3, col. 4).

TABLE 3. AGRICULTURAL SECTOR – VALUE ADDED TAX BASE FOR ALTERNATIVE FORMS OF VAT, 1963.

Subsector	Value added to base: Gross product (VA_g)	Value added to base: Income (VA_i)	Value added to base: Consumption (VA_c)	Gross receipts (GDO)	In-[a] direct taxes (T)	Depreciation (D)	Gross Invest-ment (I)	Purchased intermediate inputs (F)	Federal government purchase (G)	Net exports
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					million dollars					
1. Livestock and livestock products										
Dairy farm products	1,848.8			5,777.4				3,928.7	---	---
Poultry & eggs	632.2			3,708.6				3,073.2	3.2	11.2
Meat animal & misc.	4,206.6			17,198.4				12,990.1	1.7	27.2
SUBSECTOR TOTAL	6,687.6		5,856.4	26,684.4			831.1	19,992.0	4.9	38.4
2. Other Ag. products										
Cotton	1,017.5			3,093.2				1,658.6	417.1	521.8
Food, feed grain & grass seed	7,575.7	16,686.0		13,869.3	1,260.4	3,662.4		6,737.8	-444.1	1,726.1
Tobacco	918.0			1,490.5				572.5	--	15.0
Fruit & tree nuts	1,379.1			2,099.1				718.0	1.9	66.1
Vegetables, sugar, misc.	1,945.1			3,285.4				1,332.1	8.2	121.8
oil bearing crops	1,255.6			2,290.7				1,110.0	-74.9	452.8
Forest, greenhouse & nursery	830.4			1,138.0				307.7	--	13.7
SUBSECTOR TOTAL	14,921.4		10,773.5	27,266.2			4,147.8	12,436.7	91.8	2,917.3
3. Forestry and fishery products	770.1	1,088.7	730.5	1,751.0	67.5		39.6	1,152.8	-171.9	46.0
4. Agriculture, forestry and fishery services	564.9		437.3	1,771.9			127.6	1,190.1	169	10.7
TOTAL	22,944.0	17,774.7	17,797.7	57,473.5	1,327.9	3,841.2	5,146.1	34,771.6	-241.9	3,012.4

[a]Includes all taxes allowed as "ordinary and necessary business deduction" by U.S. Internal Revenue Service.

Source: Cols. 1-3 by calculation from cols. 4-8; cols. 4 and 8 from [6]; cols. 5 and 6 from [8]; col. 7 from [7].

The reader should stand warned that the latest data available for making these comparisons are the 1963 input-output tables, published in 1969, and no attempt has been made to make any adjustments to 1971 conditions. However, 1963 was a fairly normal expansion year, so one would expect the relationship among industries to be reasonably appropriate. Hence, the present results should be used only to establish the general situation. Too, both handling of exports and imports for tax purposes (Table 1, col.

10,) and price level changes can have important impacts for certain sectors. These will be examined in a later paper.

VAT VERSUS CIT AND TAX LIABILITY OF AGRICULTURE

The VAT has commonly been proposed as a substitute, in part, for the CIT. This proposal has special significance and would create special problems for farms and other of unincorporated business, since they could be subject to the new tax but receive no relief from any existing taxes. Such a proposal involves a new tax on business activity, regardless of the legal form of organization–corporate or noncorporate. But reducing the CIT provides relief only for those that are incorporated. This is one reason why proposals sometimes suggest that agriculture and other small businesses be exempted. Of course, the VAT could also be combined with relief of other than corporate taxes.

If used as a general revenue source, the VAT would affect agriculture as well as other sectors. But if it were designed as a substitute for all or part of the CIT, as has been commonly proposed, and no relief were provided for agriculture, the impact could be quite significant. For the agricultural sector as a whole, corporations comprised less than one percent of all business forms in 1967 (Table 4), and 18 percent of total business receipts. A VAT as a replacement of part of the CIT (with no exemption for agriculture) would mean that 99 percent of farming businesses and 82 percent of total agricultural business receipts would be subject to an additional tax. Most other sectors would get more offsetting relief from CIT. As noted from Table 4, agriculture has the lowest percentage of corporations of all sectors. Manufacturing has the highest (49.1 percent) with 98 percent of gross business receipts being generated by corporations.

The effects of such a policy on agriculture would include: (1) an increased tax burden on the farming sector and unincorporated agricultural business, (2) a tendency to stimulate movement toward the corporate form of organization to escape double taxation on business income, and (3) a possible increase in the cost of production by the amount of VAT paid on purchased inputs, which probably would not be recoverable in the short run due to inability to shift the tax forward (i.e., to include the tax in higher output price).

Various estimates have been made of the total revenue which a VAT might yield. Assuming a few exclusions and exceptions as are necessary for proper administration, a trillion dollar GNP has been estimated to yield between 3-1/2 and 5 billion dollars for each percentage point. A VAT rate of 10 percent has been advanced on this basis, as being necessary to yield adequate revenues in replacement of the CIT.

It appears, however, that the VAT is now being viewed by proponents as an additional source of revenue rather than as a replacement for other taxes. The CIT appears to be as high as economically desirable and the 1969 Tax Reform Act has attempted to close obvious loopholes, making it politically difficult to increase personal income taxes. A VAT of relatively low rate, 5 percent or less, could produce sufficient revenues to allow advancement toward social goals. Under the consumption type VAT, this would increase the tax bill of the agricultural sector by over three-quarters of a billion dollars.

Table 4. NUMBER OF BUSINESSES, PERCENT CORPORATIONS AND RECEIPTS, U. S., 1967.

Sector	Number-all businesses	Percent corporations	Total business receipts (1000 dollars)	Percent all corporations
Agriculture, forestry and fisheries	3,352,683	1.0	49,576,426	17.9
Mining	73,361	19.7	15,123,041	84.3
Construction	855,982	14.4	92,291,540	72.4
Manufacturing	401,014	49.1	588,682,221	97.9
Transportation and public utilities	359,088	18.4	106,040,278	93.5
Wholesale trade	434,137	32.8	213,195,861	85.7
Retail trade	2,046,209	15.4	320,750,967	67.4
Finance, insurance and real estate	1,222,496	32.6	86,669,635	82.8
Services	2,713,942	8.1	97,738,340	47.7
TOTAL	11,566,624	13.3	1,574,394,661	81.6

Source: From [8], Table 1.1

THE VAT AND ECONOMIC EFFICIENCY

VAT encourages economic efficiency, as compared to an income tax. Firms that are inefficient in the use of nonpurchased resources, as well as those with large exemptions , pay the VAT even though they might owe no income tax. Production rather than net earnings is taxed, so that inefficient as well as efficient firms pay. Since farming has large numbers of small units paying little or no income tax because of exemptions and deductions, or perhaps inefficiency, the impact on exit from farming could be significant. In a short paper, it is not possible to assemble data on this topic because it is difficult to make the required transition between production sector and personal data, and to do disaggregations necessary for welfare comparisons. These are urgently needed.

CONCLUSIONS

A compilation of data from various sources provides only fragmentary benchmarks, but these indicate that the proposed VAT would have important consequences for the agricultural sector, that the form of the tax used greatly affects the relative well-being of different sectors, and thus that further analysis using data in the newly-published 1963 capital flows is warranted. Additional analysis is also needed to transform these production sector based conclusions to the personal base of the farm population.

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