649

THE ECONOMICS OF FEDERAL SUBSIDY PROGRAMS

A COMPENDIUM OF PAPERS

SUBMITTED TO THE

SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT

OF THE

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PART 8—Selected Subsidies

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(II)

LETTERS OF TRANSMITTAL

JULY 26, 1974.

To the Members of the Joint Economic Committee:

Transmitted herewith for the use of the members of the Joint Economic Committee and other Members of Congress is the eighth and final part of a compendium of papers entitled "The Economics of Federal Subsidy Programs," submitted to the Joint Economic Committee.

The views expressed in these papers do not necessarily represent the views of members of the committee or the committee staff. They represent studies of a number of subsidy programs, which it is hoped will provide a focus for further hearings and public debate.

WRIGHT PATMAN,
Chairman, Joint Economic Committee.

JULY 24, 1974.

Hon. WRIGHT PATMAN,
Chairman, Joint Economic Committee,
Congress of the United States,
Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is the eighth and final part of a compendium of papers entitled "The Economics of Federal Subsidy Programs."

The Joint Economic Committee published a staff study in January 1972, entitled "The Economics of Federal Subsidy Programs," which identified the overall size and cost of Federal subsidies for fiscal 1970. The committee also invited some 40 experts to contribute papers to a compendium that would complement the staff study by evaluating particular aspects of the subsidy system. The papers in this eighth part discuss selected subsidies that cover several areas.

The papers contained herein should be interpreted as representing only the opinions of their authors, and not necessarily reflective of the views of committee members or staff.

Sincerely yours,

WILLIAM PROXMIRE, *Chairman,*
Subcommittee on Priorities and Economy in Government.

JULY 22, 1974.

Hon. WILLIAM PROXMIRE,
Chairman, Subcommittee on Priorities and Economy in Government,
Congress of the United States, Washington, D.C.

DEAR SENATOR PROXMIRE: Transmitted herewith is the eighth and final part of a compendium of papers entitled "The Economics of Federal Subsidy Programs."

The papers in this eighth part analyze subsidies in several areas, including food, water pollution abatement, cable television, health insurance, and an oil import quota system.

The committee is indebted to these authors for their excellent contributions which, in conjunction with the study prepared by the staff, should stimulate widespread discussion among economists, policymakers, and the general public on the Federal subsidy system. It is hoped that, by focusing attention on the subsidy system, this study will contribute substantially to improvements in public policy and the efficient management of public funds.

Mr. Jerry J. Jasinowski of the committee staff is responsible for planning and compiling this compendium with suggestions of other members of the staff. He was assisted in research and editorial work by Douglas Lee and in administrative and secretarial work by Beverly Park.

The papers contained herein should be interpreted as representing only the opinions of their authors, and not necessarily reflective of the views of committee members or staff.

Sincerely yours,

JOHN R. STARK,
Executive Director, Joint Economic Committee.

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TAX SUBSIDIES OF PRIVATE HEALTH INSURANCE: DISTRIBUTION, REVENUE LOSS AND EFFECTS*

By Martin S. Feldstein and Elizabeth Allison**

Introduction

Nearly all of the $17.2 billion of private payments for health insurance are subsidized by special tax advantage.[1] Employer contributions for health insurance benefits are excluded from both the corporate and personal income tax bases. Individual payments for health insurance can be partly deducted from personal taxable income. Together, these involve a substantial loss of tax revenue and a significant subsidy for the purchase of insurance. The distribution of this subsidy among income classes is very unequal, with significantly greater subsidies going to higher income families.

The current study provides a detailed analysis for 1968 and 1969, the most recent years for which data is available. Section I considers the employer contribution for health insurance benefits. A method is developed for estimating the total of employer contributions and allocating this total among income groups. The tax loss and its distribution are then estimated. Section II deals with the deduction of individual insurance premiums in the calculation of personal taxable income. The total cost of this subsidy and its distribution are estimated. A final section discusses the effect of this tax subsidy on the demand for health insurance and the market for health services.

I. The Exclusion of Employer Premium Payments

In 1969, employers paid approximately $7.3 billion in health insurance premiums. These premiums are excluded in defining taxable income for both the personal income tax and the social security payroll tax. If these premiums had instead been paid to the same workers in the form of wages and salaries, the additional tax revenues would have been at least $1.63 billion. The distribution of this $1.63 billion tax saving among income classes was substantially regressive.

These conclusions are based on an estimated distribution of employers' contributions by family income.[2] This in turn depends on two separate estimates: (1) the distribution of employers' contributions by

employees' earnings and (2) the distribution, within each earnings class, of total family income including spouse's earnings and other family income (interest, dividends and rent).

Consider first the distribution of employer's contributions by employees' earnings. In estimating this distribution we have tried to avoid any assumptions that would increase the estimated total tax cost or the estimated regressivity of the premium payments. In particular, we have assumed that *within each industry* all employees receive the same employer contribution. The estimated differences between earnings classes in the employer contribution is therefore due solely to interindustry differences in average employer contributions and in the distribution of earnings. The effect of this is to bias the estimates toward a smaller tax loss and a less regressive distribution.[3]

Estimation of the distribution of employers' contributions by employees' income begins with a distribution of the average 1969 employer contribution in each of 32 industries. This is shown in Table 1.[4] Information on the distribution of earnings in each industry [5] and the assumption that all employees in each industry receive the same benefit permit the calculation of the employers' contribution by employees' earnings for the economy as a whole.[6] This distribution by employees' earnings is converted to a distribution by family income with the aid of a joint distribution of husbands' and wives' earnings in 1969 calculated from the *Current Population Survey,*[7] and a distribution of "other income" (interest, dividend, rent, etc.) by family income based primarily on the Federal Reserve Board Survey of Financial Characteristics.[8]

The distribution of employers' contributions by family income is shown in column 3 of table 2.[9] It rises from a low of $96 in the lowest income brackets to approximately $170 above $10,000. It should again be stressed that this very substantial rise has been found even though

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[3] A 1963 survey (Bureau of Labor Statistics, *Survey of Supplementary Compensation for Non-Production Workers,* Bulletin 1470, 1965) showed that employer contributions were generally higher for white collar employees. Rice, R. "Skill, Earnings and the Growth of Wage Supplements," *American Economic Review/8* 56 (May 1966) p. 585) found no difference in employer contributions by size of firm within individual industries.

[4] Because we assume that married women are effectively covered by their husbands' insurance, the employer contributions per employee are adjusted by the calculation to exclude married women employees. No attempt is made in the analysis to allow for the lower value of benefits to single men and women. Since they have lower than average earnings, this further underestimates both the tax cost and the regressivity.

[5] The sources for this data are: Bureau of Labor Statistics, *Annual Earning and Employment Patterns of Private Non-Agricultural Employees, 1965,* Bulletin 1675, 1970; Bureau of the Census, Census of Government, Vol. 3, No. 2, 1971.

[6] More specifically, if P_i is the average employer payment per employee (excluding married women) in industry i and n_{ij} is the number of employees (again excluding married women) in income class j and industry i, we calculate the average employer payment for employees in income class j as

$$P_j = \frac{\sum_i n_{ij} P_i}{\sum_i n_{ij}}$$

[7,8] Projector Dorothy S. and Weiss, Gertrude. *Survey of Financial Characteristics of Consumers.* Washington: Board of Governors of the Federal Reserve System, August 1966. Implicit in this conversion is the assumption that, when both husband and wife are employed, only the husband's insurance is of value to the family. Details on the method of estimating 1969 "other income" on the basis of the Federal Reserve Board survey are presented in the appendix.

[9] Note that these incomes refer only to the earnings of husbands and wives and their income from property (rent, interest, dividends, etc.). Specifically excluded are all transfer payments and earnings of other persons in the same family. This is appropriate for our tax calculation but overstates the number of low income families.

our method tends to underestimate the relation between earnings and employers' payments for insurance.[10]

The marginal tax rates by income class calculated from Pechman's estimates of the average effective tax rates, are shown in column 4.[11] The relevant marginal tax rates include the personal income tax and social security tax payments. Since we assume that if the employer had not paid the insurance premium he would have paid an equal amount in gross wages, the relevant social security tax is the sum of the employer and employee taxes or 9.6 percent in 1969. This is, or course, relevant only if the husbands' earnings did not exceed the 1969 limit of $8,000 on taxable payroll income.[12]

TABLE 1.—AVERAGE EMPLOYER CONTRIBUTIONS FOR HEALTH INSURANCE BY INDUSTRY

Industry	Average contribution per employee	Industry	Average contribution per employee
Mining	$328	Apparel	$59
Construction	170	Paper	175
Ordinances	274	Printing	151
Lumber	175	Chemicals	222
Furniture	175	Petroleum	233
Stone, glass, clay	227	Rubber	197
Primary metals	322	Leather	197
Fabricated metals	199	Wholesale trade	96
Machinery, except electrical	199	Retail trade	62
Electrical machinery	253	Finance, insurance, real estate	101
Transportation equipment	189	Transportation	171
Instruments	178	Utilities	172
Miscellaneous manufacturing	168	Communication	172
Food	205	Services	31
Tobacco	205	Federal Government	96
Textiles	86	State and local government	155

TABLE 2.—ESTIMATES OF TAX REDUCTION BY FAMILY INCOME CLASS, 1969

Family income	Number (thousands)	Employer contribution per family	Marginal tax rate	Tax reduction per family	Total tax reduction
(1)	(2)	(3)	(4)	(5)	(6)
Less than $1,000	2,377	96	0.126	12.10	28,761
$1,000	2,052	96	.204	19.58	40,178
$2,000	2,055	113	.187	21.13	43,422
$3,000	2,045	122	.199	24.28	49,653
$4,000	2,466	138	.192	26.50	65,349
$5,000	2,915	145	.203	29.44	85,818
$6,000	3,424	154	.251	38.65	132,338
$7,000	3,812	145	.260	37.70	143,712
$8,000	7,230	159	.186	29.57	213,791
$10,000	12,016	169	.220	37.18	446,755
$15,000	6,863	174	.270	46.98	322,424
$25,000 plus [1]	972	162	.363	58.81	57,163
	48,227				1,629,364

[1] Tax rates and reduction based on $40,000.

[10] The estimates in this table indicate that the total of these employer contributions was $10.1 billion.

[11] The effective marginal income tax rate in income class j is defined by the formula

$$mt_j = \frac{(at_{j+1})(INC_{j+1}) - (at_j)(INC_j)}{INC_{j+1} - INC_j}$$

where at_j is the average tax rate in income class j and INC_j is the average income in income class j. Estimates of the average effective tax rates are presented is Joseph Pechman, *Federal Tax Policy*. Washington : The Brookings Institution, 1966.

[12] Within each income class above $8,000, some families have two earners and the husbands' income is below the $8,000 limit. Information from the distribution of husbands' and wives' earnings was used to obtain the appropriate average social security tax rate in each income class.

The tax saving per family by income class is shown in column 5. It increases much more rapidly than the employer contributions, from a low of $12.10 in the lowest category to more than $35 for incomes over $10,000. At an income of $40,000 (used to calculate tax rates in the $25,000+ class), the tax reduction is $58.81.[13] Although the tax reduction tends to rise continually over the full range of incomes, the rise is fastest up to an income of $6,000. The families with incomes below $6,000 receive very much smaller subsidies than the rest of the population.[14]

Column 6 shows the total tax reduction for all families in each income class. The sum of these tax reductions, i.e., the total revenue loss due to excluding employer contribution in defining income, is $1.63 billion. As we have noted at several points, our assumptions would tend to produce an underestimate of the actual revenue loss.[15]

An alternative way to assess regressivity of the tax reduction is by comparing the cumulative percentages of tax reductions and families by income class. This is shown in table 3. The regressivity is greatest in the lower income classes. Twenty-nine percent of families had incomes below $6,000, but received only 19 percent of the tax reductions. The top 16 percent of families received 23 percent of the tax reductions.

TABLE 3.—DISTRIBUTIONAL IMPLICATIONS OF TAX REDUCTIONS DUE TO EMPLOYER CONTRIBUTION EXCLUSION, 1969

Family income	Tax savings per family	Cumulative percentage of tax reduction	Cumulative percent of families
Less than $1,000	$12.10	1.8	4.9
$1,000	19.58	4.2	9.2
$2,000	21.13	6.9	13.4
$3,000	24.28	10.0	17.7
$4,000	26.50	14.0	22.8
$5,000	29.44	19.2	28.8
$6,000	38.65	27.3	35.9
$7,000	37.70	36.2	43.8
$8,000	29.57	49.3	58.8
$10,000	37.18	76.7	83.7
$15,000	46.98	96.5	97.9
25,000 plus	58.81	100.0	100.0

II. THE DEDUCTION OF INDIVIDUAL PREMIUM PAYMENTS

The current tax law provides that a taxpayer can deduct 50 percent of his health insurance premium, up to a maximum deduction of $150, in calculating his taxable income. Unlike other medical expense deductions, the right to this deduction does not depend on expenditures exceeding a minimum amount.

In 1968 [16] a deduction for health insurance premiums was taken on 19,562,860 taxable returns.[17] This was 41 per cent of the taxable returns with itemized deduction and 27 percent of all returns.

[13] The marginal tax rates of Column 4 are also probably a conservative estimate of actual marginal rates and therefore of the regressivity of the tax reductions.

[14] This analysis makes no allowance for Medicaid or Medicare. The families eligible for these programs are treated as if they actually receive employer benefits. This also reduces the apparent inequality between income classes, although the effect is likely to be small in almost all states.

[15] Although this estimate is substantially higher than the value for fiscal year 1968 of $1.1 billion, in the *Annual Report of the Secretary of the Treasury for 1968* (Washington: Government Printing Office, 1969), the $1.1 billion excluded the social security tax.

[16] The Internal Revenue Service publishes the distribution of deductions for insurance premiums only every other year. Data for 1970 is not yet available.

[17] Internal Revenue Service, *Statistics of Income for 1968*, Washington: Government Printing Office, 1970, p. 31.

The total of all such deductions was $1.75 billion, implying an average deduction of $89.40 per return on which an insurance deduction was taken. Table 4 shows the distribution of deduction by income class. To put this information in perspective, the table also shows the number of returns and the total income in each income class.

The amount by which the insurance deductions reduce taxes in each income class is the product of the total insurance deduction (column 5 of table 4) and the appropriate marginal rate in that income class. There are two ways to estimate the marginal tax rate by adjusted gross income class. The "statutory tax rate method" takes the average taxable income in each adjusted gross income class and uses the marginal statutory tax rate for that income class.[18] The "effective tax rate method", used in section I, is calculated by relating the difference in average taxes between income classes to the differences in the average adjusted gross income.

TABLE 4.—DISTRIBUTION OF HEALTH INSURANCE DEDUCTIONS BY INCOME CLASS, 1968

Adjusted gross income	Number of returns [1]	Total Adjusted gross income (thousands)	Number with insurance deduction [2]	Total insurance deductions [2] (thousands)
(1)	(2)	(3)	(4)	(5)
Under $1,000	7,735,280	$203,841	(3)	(3)
$1,000	7,467,095	11,062,792	149,200	9,221
$2,000	5,896,399	14,653,921	476,347	32,905
$3,000	5,565,323	19,456,758	778,781	58,475
$4,000	5,279,417	23,717,836	1,040,306	85,518
$5,000	4,998,207	27,484,220	1,278,862	101,498
$6,000	4,955,627	32,206,627	1,525,918	131,774
$7,000	4,743,142	35,572,227	1,580,827	138,801
$8,000	4,613,452	39,160,955	1,705,248	151,834
$9,000	4,023,579	38,178,720	1,566,147	141,874
$10,000	11,985,301	144,542,748	5,647,347	513,525
$15,000	3,660,989	62,117,475	2,086,158	200,192
$20,000	1,181,010	26,075,927	724,408	73,746
$25,000	1,239,870	41,194,949	700,113	83,541
$50,000 plus	384,017	36,951,491	231,751	26,197
All income classes	73,728,708	554,420,487	19,562,860	1,749,125

[1] All returns, including those with no tax liability.
[2] Data here relates to taxable returns only.
[3] No value given by Internal Revenue Service because of high sampling variability.

Table 5 presents the two estimates of the relevant marginal tax rates and of the corresponding reduction in tax by income class. In general, the marginal rates based on the statutory tax rate method are higher than the marginal rates derived with the effective tax rate method. The total tax reduction implied by the statutory tax rate method is $389 million. For the effective tax rate method, the total tax reduction is $339 million. Since the total of *individual* payments for health insurance was approximately $6.6 billion in 1968,[19] these tax reductions are a subsidy of about 5 percent of individual premiums. However, since a significant part of these individual payments were the employee's share of premiums financed primarily by employers, this greatly understates the effective rate of subsidy. We return to this in section III below.

[18] Assuming all taxpayers use income splitting provides a conservative estimate of these rates, particularly in high income brackets.
[19] The estimate of $6.6 billion is 51 percent of total premium of $12.9 billion (Mueller, op. cit.). In 1969, the employer payments of $7.3 billion (see section I) were 49 percent of total premiums of $14.7 billion (Mueller, ibid.).

The distributional implications of these tax subsidies can be best understood if the tax reductions of table 5 are expressed on a per tax-payer basis and if the share of the total tax reductions going to each income class is related to its share of total taxes and of total income. This is done in table 6 using the tax reduction estimates based on the more conservative effective marginal rate method.

TABLE 5.—ALTERNATIVE ESTIMATES OF MARGINAL TAX RATES AND TOTAL TAX REDUCTION BY ADJUSTED GROSS INCOME CLASS, 1968

Adjusted gross income	Estimated marginal tax rate		Estimated total tax reduction (thousands)	
	Statutory rate method	Effective rate method	Statutory rate method	Effective rate method
(1)	(2)	(3)	(4)	(5)
Under $1,000	0.151	0.123	0	0
$1,000	.151	.117	$1,392	$1,079
$2,000	.151	.109	4,969	3,587
$3,000	.161	.111	9,414	6,491
$4,000	.172	.116	14,709	9,920
$5,000	.172	.120	17,458	12,180
$6,000	.182	.140	23,983	18,448
$7,000	.204	.130	28,315	18,044
$8,000	.204	.154	30,974	23,382
$9,000	.204	.178	28,942	25,253
$10,000	.204	.222	104,761	114,004
$15,000	.269	.219	53,852	43,842
$20,000	.301	.265	22,198	19,543
$25,000	.388	.384	22,397	32,125
$50,000 plus	.063	.433	15,797	11,343
All income classes			389,162	339,244

TABLE 6.—DISTRIBUTIONAL IMPLICATIONS OF TAX REDUCTIONS DUE TO PERSONAL DEDUCTIONS, 1968 [1]

Adjusted gross income	Tax reduction per taxpayer [2]	Cumulative percentage of total tax reduction [2][3]	Cumulative percentage of total adjusted gross income [2][3]	Cumulative percentage of total taxes [2][3]	Cumulative percentage of returns [2][3]
(1)	(2)	(3)	(4)	(5)	(6)
Under $1,000	0	0	0.9		10.5
$1,000	0	.3	2.7	0.5	20.6
$2,000	$.61	1.4	5.3	1.6	28.6
$3,000	1.17	3.3	8.8	3.5	36.2
$4,000	1.88	6.2	13.1	6.2	43.3
$5,000	2.44	9.8	18.0	9.5	50.1
$6,000	3.72	15.2	23.8	13.6	56.8
$7,000	3.80	20.6	30.2	18.4	63.3
$8,000	5.07	27.5	37.3	23.9	69.5
$9,000	6.28	34.9	44.1	29.5	75.0
$10,000	9.51	68.5	70.1	53.4	91.2
$15,000	11.98	81.4	81.3	65.5	96.2
$20,000	16.55	87.2	86.0	71.3	97.8
$25,000	25.91	96.7	93.4	82.7	98.5
$50,000 plus	29.54	100.0	100.0	100.0	100.0

[1] Based on the effective tax rate method.
[2] All taxpayers, including those who did not claim the insurance deduction and those not liable for tax.
[3] Cumulative percentage to top income in income class.

The regressivity of the tax reductions is striking. Half of the tax returns are for incomes of less than $6,000. The average tax reduction from the insurance deduction is about $3 at this income level. For incomes of $10,000 to $15,000 the tax reduction is still less than $10 per taxpayer. At $20,000, however, it is about $17 and above $50,000 it is over $30. The cumulative percentages show that families with in-

comes of less than $6,000 account for half of the tax returns, but only about 10 percent of the tax reduction. Nearly two-thirds of the tax reduction goes to the 25 percent of taxpayers with incomes above $10,000. A third of the tax reduction goes to the 10 percent of taxpayers with incomes above $15,000.

A comparison of the distribution of tax reductions with the distributions of incomes and of taxes paid shows that for incomes below $9,000 the share of tax reductions is approximately proportional to taxes paid and therefore less than proportional to adjusted gross income. Between $15,000 and $25,000, the tax reductions are approximately proportional to income. Only above that level do the reductions become progressive.

III. Effects on the Demand for Insurance and Health Services

The annual tax subsidy of nearly two billion dollars encourages an excessive use of health insurance and inflates the demand for hospital and medical care. The current section provides a brief description of these distortions.[20]

The tax subsidy means that for many insured persons the net cost of the insurance premiums is less than the average benefits paid by health insurers. If the $2.0 billion [21] subsidy is subtracted from total 1969 premiums of $14.7 billion, the net cost of the premiums is $12.7 billion. This is actually 3 percent *less* than the $13.1 billion of insurance benefits paid by insurers in 1969.

Many families (and their employers) therefore pay less for every dollar of health care that they purchase through insurance than they would have to pay to buy that same care directly. Since premiums do not increase in proportion to the actuarial value of the policy because of a fixed component in the cost of administration, the *marginal* rate of subsidy on additional insurance is likely to be greater than the average rate of subsidy. Moreover, since administrative costs are much higher for individual policies and small groups than for large groups, the net cost of premiums is actually very much less than the average benefits for many persons who are insured as members of large groups. Finally, since premium income is collected some time before benefits are paid, the companies' premiums and benefits for the same calendar year (1969) may cause a substantial understatement of the net rate of subsidy.

The net subsidy of insurance and the fact that for most families it is actually cheaper to purchase care through insurance than to buy it directly obviously encourages the purchase of more insurance than household would choose to purchase just for the advantage of risk spreading. This subsidy may also explain why so much "shallow coverage" insurance (i.e., coverage for small and moderate health expenses but not very large or catastrophic expenses) is purchased when more serious risks are still uninsured. Households that choose not to insure

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[20] Appendix A discusses this in greater detail. For further discussion, see Feldstein, M. S., *The Rising Cost of Hospital Care*, published for the Department of Health, Education, and Welfare. Washington : Information Resources Press. 1971 : ——, "Hospital Cost Inflation : A Study in Non-Profit Dynamics". *American Economic Review*, Vol. LXI, No. 5, December 1971, pp. 853–872 : ——, "The Welfare Loss of Excess Health Insurance", *Journal of Political Economy*, Vol. 81, No. 2, March 1973.

[21] The 1969 subsidy due to excluding employer payments was $1.63 billion. The 1968 estimates of $339 million and $389 million understate the corresponding figure for 1969.

against major risks may nevertheless take advantage of the tax subsidy that is available for prepaying small health expenses.[22]

The effect of this artificially expanded use of insurance is an increase in the demand for health care and a resulting rise in its price. More explicitly, insurance lowers the price of health services to the patient at the time that he purchases care. The lower net price encourages him to purchase more expensive care than he would if he had to pay the full price.[23] It is important to recognize that insurance increases demand by distorting the price and not merely by making cash available at the time of illness. Insurance can increase demand as much for high income families with substantial liquid assets as for low income families with small savings. Hospitals respond to this increase in demand by raising the general sophistication of their care and therefore the average cost per day.[24] Physicians also appear to raise their average fee when their patients have more insurance.[25] This increase in health care prices increases the risk of families and therefore encourages the purchase of even more insurance. The tax subsidy thus accelerates the unfortunate cycle by which more insurance causes prices to rise, increasing the demand for insurance and thus raising prices further.

In short, the special tax treatment of personal and employer payments for health insurance causes a substantial revenue loss, distributes these tax reductions very regressively, encourages an excessive purchase of insurance, distorts the demand for health services, and thus inflates the prices of these services. Removing these special tax advantages would be a useful part of any program to reform our system of health insurance, increase the efficiency of the health care system, and reduce the rate of inflation of health care prices.

APPENDIX A

INSURANCE AND HOSPITAL COST INFLATION

By MARTIN FELDSTEIN

Section III of the text of this paper asserted that the tax subsidies to health insurance have the effect of increasing the use of hospital insurance and therefore of raising the rate of hospital cost inflation.

The purpose of the current appendix is to describe briefly and nontechnically the way in which insurance for hospital care has been a primary source of hospital cost inflation. This discussion draws heavily on Chapter 3 of my *Rising Cost of Hospital Care.**

Effects of Insurance on Net Cost Per Patient Day

The average cost per patient day (ACPPD) in short-term hospitals rose from $15.62 in 1950 to $61.38 in 1968. If this is deflated by the consumer price index

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[22] It is also likely that employees assume that employer payments for health insurance do not result in a corresponding decrease in money income. This encourages the tendency of both unions and employers to provide relatively comprehensive benefits.
[23] There are now a number of studies that indicate that the demand for care is sensitive to price and therefore rises when insurance lowers the net price of care ; see, e.g.. Feldstein, M. S., "Hospital Cost Inflation", loc. cit., and Rossett, Richard N. and Huang. Lien-fu. "The Effect of Health Insurance on the Demand for Medical Care," *Journal of Political Economy*, Vol. 81, No. 2, March 1973.
[24] For an analysis and specific estimates of this response. see Feldstein, M. S., *The Rising Cost of Hospital Care*, and "Hospital Cost Inflation : A Study in Non-Profit Price Dynamics". loc. cit.
[25] See Feldstein, M. S., "The Rising Price of Physicians' Services," *The Review of Economics and Statistics* 52 :2 (May 1970). pp. 121–133.
*Published in 1971 for the Department of Health. Education and Welfare by Information Resources Press, 2100 M Street, N.W., Washington. D.C.

and expressed in constant 1957–59 dollars, the rate of increase is still very great. The deflated average cost per patient day rose from $18.64 in 1950 to $50.64 in 1968.

Because of payments by insurance companies and by the government, the average cost per patient day does not measure the movement of the net cost to patients of a day of hospital care. Although the gross cost is the appropriate way to assess hospital inflation, the net cost to patients is sometimes a more relevant statistic for understanding its sources and its effects. There are three different ways in which net cost may be approximated; each has its own use. The cost net of payments by both insurance and government (Net Cost 1) measures the average financial impact on patients of a period in hospital. It is also the average price that affects patients' demands for hospital care at the time of illness. However, since most families do not receive government assistance in paying hospital bills, it is relevant to study cost net of insurance but not net of any government payments (Net Cost 2). The third definition of net cost—net of payment by government but not net of insurance payments—measures the average cost of purchasing hospital care, whether paid directly or prepaid through insurance.

These measures of net cost have behaved very differently from the gross cost statistics discussed above. As Table A–1 shows, the proportion of the population with private hospital insurance increased from 51 percent in 1950 to 86 percent in 1968. In 1950, insurance paid 26 percent of hospital costs and 35 percent of "private" hospital costs (i.e., those not paid by government). By 1968, insurance was paying 44 percent of all hospital costs and 74 percent of private hospital costs. During this period, government payments for hospital care rose from 26 percent of the total to 40 percent. It is clear that net cost, by any definition, has increased much more slowly than gross costs.

TABLE A–1.—NET COST OF HOSPITAL CARE

	1950	1955	1960	1963	1966	1968
Proportion of population with private hospital insurance	50.8	64.7	73.0	77.5	81.6	85.8
Percentage of hospital costs paid by insurance	25.7	39.8	50.0	54.2	50.2	44.2
Percentage of hospital costs paid by Government	25.7	23.2	21.4	19.3	25.5	40.0
ACPPD	$15.62	$23.12	$32.23	$38.91	$48.15	$61.38
Net cost 1	7.59	8.58	9.19	10.31	11.70	9.70
Net cost 2	10.22	11.14	11.70	12.76	15.70	16.14
Net cost 3	11.61	17.76	25.33	31.40	35.87	36.83

$$\text{Net Cost 1} = \text{ACPPD} \times \frac{\text{Direct Consumer Expenditure}}{\text{Total Expenditure}}$$

$$\text{Net Cost 2} = \text{ACPPD} \times \frac{\text{Direct Consumer Expenditure}}{\text{Total Private Expenditure}}$$

$$\text{Net Cost 3} = \text{ACPPD} \times \frac{\text{Total Private Expenditure}}{\text{Total Expenditure}}$$

Direct Consumer Expenditure+Insurance Benefits = Total Private Expenditure
Total Private Expenditure+Government Expenditure = Total Expenditure

Because insurance benefits and government payments are not simple proportional reimbursements of all hospital costs, the three definitions of net cost per hospital day can be interpreted only in an approximate "on average" sense. More specifically, table A–1 uses the following definitions:

$$\text{Net Cost 1} = \text{ACPPD} \times \frac{\text{Direct Consumer Expenditure}}{\text{Total Expenditure}}$$

$$\text{Net Cost 2} = \text{ACPPD} \times \frac{\text{Direct Consumer Expenditure}}{\text{Total Private Expenditure}}$$

$$\text{Net Cost 3} = \text{ACPPD} \times \frac{\text{Total Private Expenditure}}{\text{Total Expenditure}}$$

where Direct Consumer Expenditure excludes insurance benefits, Total Private Expenditure indicates both direct consumer expenditure and insurance benefits, and Total Expenditure includes both private and government payments.

The statistics for Net Cost 1 show that, when deductions are made for payments by insurance companies and government, the cost of an "average" hospital day has risen only 28 percent since 1950; i.e., from $7.59 in 1950 to $9.70 in 1968. If we ignore hospital care paid by government (Net Cost 2), the rise is still only 58 percent since 1950. The Net Cost 3 figures show that even the total personal cost of care, including insurance benefits, rose much more slowly than the total ACPPD.

Since Net Cost 1 and 2 are measures of the prices that influence patients' demand for hospital care at the time that they decide to purchase, it is appropriate to compare their increase with the increase of consumer prices in general. Table A-2 expresses the ACPPD and net cost estimates in constant 1957–59 dollars. The deflated Net Cost 1 shows a startling trend: a *decline* of more than 16 percent since 1950. This means that, because of the growth of third-party payments, the "average" patient at the time of his illness had to forego less of other goods and services in 1968 to buy a day of hospital care than he did in 1950. It is not surprising that patients' demands for more and better hospital services have increased! Even for patients who do not receive government help in paying for hospital care, the real net cost (i.e., deflated Net Cost 2) has risen less than 4 percent in the entire period from 1950 to 1968.

TABLE A–2.—NET COST OF HOSPITAL CARE RELATIVE TO THE CONSUMER PRICE INDEX

	1950	1955	1960	1963	1966	1968
Deflated ACPPD	$18.64	$24.78	$31.26	$36.47	$42.57	$50.64
Deflated net cost 1	9.06	9.20	8.91	9.66	10.34	7.60
Deflated net cost 2	12.20	11.94	11.35	11.96	13.88	12.64
Deflated net cost 3	13.85	19.04	24.57	29.43	31.72	28.84

Note: Prices are expressed in constant 1957–59 dollars by deflating the consumer price index. See table A–1 for net cost definition.

The Nature of Hospital Cost Inflation

Previous discussions of hospital cost inflation have generally focused on *how* inflation has occurred (e.g., more staff, higher wages, more equipment, etc.) rather than on *why* it has. In contrast, the primary purpose of this appendix is to explain why cost per patient day has risen so much faster than other prices in our economy. The explanation that is presented here emphasizes the role of increasing demand for hospital services. As will be clear, however, it differs substantially from the traditional economic models in which price rises are induced by shifting demand. Unlike these models it introduces the notion that increasing demand causes hospitals to change the nature of the product itself. It also develops the ideas that technical progress in hospitals generally increases cost and that, because of the special characteristics of the hospital industry, increasing demand raises wages in an unusual way.

This appendix concentrates on the nature and origins of the increasing demand for hospital care and the general character of the hospitals' response. The impact of scientific progress is discussed in Chapter 4 of *The Rising Cost of Hospital Care.* Here it is assumed that hospitals choose from a range of possible techniques of care and standards of comfort that is known and constant through time. As a second simplification, the wage rates paid by hospitals are assumed to change independently through time and not to reflect changes in the demand for hospital services. This assumption is dropped in the discussion of wage changes in Chapter 5 of *The Rising Cost of Hospital Care.*

Before the sources of increased demand can be discussed, it is necessary to be clear about the meaning of "a change in demand" for so complex a product as hospital care. An increase in demand must of course be defined to include the usual notion that the population would be willing to pay a higher price (i.e., charge per patient day) for the current amount of care and, at the current price, would want to purchase a greater number of hospital days. If hospitals are operating close to effective capacity, such an increase in demand would lead to a perceived "shortage" of hospital beds until more beds are acquired or the

price is raised. This is the traditional way in which economic analysis defines an increase in demand. A discussion of hospital cost inflation requires a broader definition. An increase in demand must also be defined to include a willingness to pay more for a given improvement in "perceived quality".[1] The term "perceived quality" is intended to convey increases in the efficacy of medical care, increases in the comfort of hospital stay, and changes in medical practice that patients *believe* increase the efficacy of care, even if they do not in fact. For example, we shall say that demand has increased when, for any given length of stay, patients who would previously have paid five dollars more per day for a semiprivate room that for a bed in a ward become willing to pay ten dollars more. Other examples include an increase in the amount patients would pay for a bed in an intensive care unit, for a greater availability of nursing staff, or for more complete laboratory tests.

Sources of Increased Demand

There are three main reasons why the demand for hospital care has increased: the higher prices of other goods and services, rising personal incomes, and the growth of insurance. After considering these, the current section discusses several other noneconomic factors that have contributed to increasing demand.

Economic Factors. Absolute money prices as such do not determine the demand for any product. Rather, it is the price of that product *relative* to the prices of other goods and services that determines demand. The general level of consumer prices as measured by the CPI has risen almost continuously, although at very different rates, throughout the entire period since 1950. On average it rose 2.1% annually between 1950 and 1968. If hospital charges had remained constant, hospital care would have become less expensive relative to the other goods and services that consumers purchase (even if there had been no change in insurance) and the demand for care would therefore have increased. Stated somewhat differently, if there had been factors influencing demand, the demand for hospital care would have exceeded supply, unless the average charge rose some 2.1% a year.

The mean per capita real disposable income rose 47 percent from 1950 to 1968. The tendency of economists to classify hospital care as a "necessity," implying that the demand for care rises little as income increases, is misleading. Although there is a substantial amount of survey evidence that admission rates and patient days per year do not rise with income, that evidence also indicates that the demand for higher "quality" care is quite sensitive to income. Table A-3 presents estimates, based on the 1963-64 survey of hospital discharges conducted by the National Center for Health Statistics, that show generally lower admission rates and shorter average durations of stay for persons in higher income families.[2] Although expenditure data are not available in the 1963-64 survey, a similar study for 1962 does provide estimates of per capita expenditure on hospital care; this is reported in column 4 of table A-3. There is a clear increase in this expenditure as income rises. The final column of table A-3 combines these expenditure data with the inverse relation between income and bed days in 1963-64 to estimate per patient day expenditures by income class for 1962. The results are striking: expenditure per patient day rises from $21 in families with incomes under $4,000 to $42 in families with incomes over $10,000.[3,4]

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[1] Although one could incorporate this "quality" aspect of increasing demand into the usual framework of economic analysis by defining each of the quality differentials as a completely different product with a separate demand curve, it is more fruitful in the current context to think of a single "two-dimensional" (quantity and quality) product.

[2] The data in Table A-3 have been adjusted for differences in the age composition of the income classes. More detailed data by age and sex generally repeat this pattern: the one exception is that, among persons over 65, those with family incomes exceeding $10,000 had higher per capita patient days than those with lower incomes.

[3] Although price discrimination (i.e., charging different prices to different patients for the same service) has been common among physicians, hospitals do not follow such a policy. The disproportionately higher prices charged for private rooms and greater amenities do not constitute price discrimination. They may, however, be some element of price discrimination in hospital bill collection.

[4] This evidence should be regarded with some caution since the statistics are based primarily on interview surveys. Respondents are asked to state their expenditure on hospital care, including both that part paid directly and the part paid by insurance. Differences in the type of insurance coverage in different income classes may affect estimates of the amount paid by insurance. The data also omit the value of care paid for by government or nonprofit organizations.

TABLE A-3.—INCOME AND DEMAND FOR HOSPITAL CARE [1]

Family income	Discharges per 1,000 population (1)	Mean stay (days) (2)	Patient days per 1,000 population (3)	Expenditures per capita (4)	Expenditures per patient day (5)
Under $2,000	123.5	9.5	117.3	$24	$20
$2,000 to $3,999	141.7	9.3	131.8	29	22
$4,000 to $6,999	132.6	7.4	98.1	31	32
$7,000 to $9,999	124.9	7.2	89.9	32	36
$10,000 and over	119.8	6.9	82.7	35	42

[1] All figures age-adjusted.

The growth of private and public insurance coverage has no doubt been the single greatest cause of increased demand.[5] The direct effect of insurance is to lower the *net* price paid by the patient at the time he decides how much care to consume and therefore to raise his demand for hospital care.[6] In practice, insurance pays not merely a fixed proportion of hospital bills but some complex combination of proportional payments, fixed indemnities, and service benefits, subject to a variety of deductions, exclusions, and ceilings. However, treating insurance as a proportional price reduction underlines its primary effect and provides a useful approximation for discussing its overall impact on demand.[7] The portion of *private* hospital expenditure (i.e., excluding all government direct and indirect payments) paid by insurance rose from 34.6 percent in 1950 to 73.7 percent in 1968. If the average cost per patient day had remained at its 1950 level of $15.62, the average *net* cost to be paid by patients would have fallen from $10.22 (65.4 percent of $15.62) to $4.10 (26.3 percent of $15.62) in 1968. Even if the demand for hospital care were not very sensitive to price, such a large decrease in net price could have increased demand substantially. To keep the average net cost unchanged from 1950 to 1968 (i.e., to "neutralize" the effect on demand of the increased insurance), the gross cost would have had to rise 149 percent to $38.86.[8]

The growth of government payments for hospital care, both directly and through programs like Medicare and Medicaid, further increased demand. When government payments were included, the proportion of total short-term hospital expenditure paid by "third parties" rose from 51.4 percent in 1950 to 84.2 percent in 1968.

This discussion of the impact of increases in income and insurance has implicitly assumed that it is the patient, and not his doctor, who makes the decisions about the use of hospital care. In fact, the decisions are to an important extent made jointly. But the significance of the patient's preferences should not be underestimated. The patient takes the initiative in seeking the advice and care of the physician. In many cases, the patient may reject the physician's advice to enter hospital, preferring to "postpone" an elective operation or to seek additional medical opinions until one confirms his preference to avoid hospitals care. If he does go into a hospital, the patient may influence the choice of institution and

[5] The growth of insurance coverage is not, of course, an independent (exogenous) factor like the rise in income but is in part a response to the rapid increase in hospital charges.

[6] It is also extremely important in this context that insurance carriers have not actively interfered with hospital costs. Insurers either pay the patient and have no direct dealing with hospitals or reimburse hospitals on the basis of cost.

[7] It is sometimes asserted that the effect of insurance is to lower the price elasticity of demand (i.e., the sensitivity of demand to price as measured by the absolute value of the ration of the percentage change in quantity demanded to the percentage change in price). There is no reason to believe that this is generally true; it depends on both the nature of the insurance and the structure of patients' preferences. If insurance paid 100% of hospital bills, patients would of course be completely insensitive to hospital charges (a zero price elasticity). Other types of insurance may leave the price elasticity constant or even increase it. The approximation that insurance pays a proportion of the hospital bill illustrates this. It is perfectly possible that such insurance has no effect on the elasticity of demand; if, in the absence of insurance, the demand function has constant elasticity, this elasticity will not be changed by proportional insurance. It is also easy to see how insurance might actually increase the price elasticity of demand: at a very high price and in the absence of insurance, only medically urgent care would be purchased, with the result that a small rise or fall in price would have no effect on the quantity consumed. The introduction of proportional insurance that substantially lowers the *net* price induces patients to purchase many optional items, with the result that they might be quite sensitive to net price changes.

[8] To the extent that the rise in demand induced an increase in the perceived quality of care, an even larger price increase was necessary, to remove excess demand.

the length of stay. Even if the physician makes these choices, he is likely to take into account the patient's income and insurance coverage. Relatively little is known about physician behavior in these matters. If doctors are also influenced in their use of resources by the *gross* price of services as well as the net price, insurance will influence their decisions less than the decisions of patients.

NONECONOMIC FACTORS

Income, insurance, and the prices of other consumer goods and services are three basic "economic" variables that have increased the demand for hospital care since 1950. Three other types of variables may be distinguished: biological (demographic structure and disease incidence), attitudes, and the availability of beds.

Because hospital use varies substantially by age and sex, the changing demographic structure of the population can influence the demand for hospital care. From 1950 to 1968, several offsetting demographic changes were occurring. For example, persons over 65, who use many more bed days per capita than average, increased from 8 to 10 percent of the population. At the same time, persons under 25, whose per capita use of hospital beds is less than average, increased from 42 to 47 percent. A demographic index of hospital use, with the numbers of bed days per capita in ten age-sex groups in 1963 as weights, indicates that the changing demographic structure had no effect on the overall demand for hospital bed days; [9] the index value changed less than 1 percent between 1950 and 1968.[10]

Several writers have noted that the changing pattern of disease incidence and the improvements in out-of-hospital care have changed the diagnostic mix of the cases admitted to hospitals. Although there is no general national data for this period, there seems to have been a reduction in the number of patients with infectious and parasitic diseases and an increase in the number with cancer and circulatory system diseases. These diagnoses generally use more hospital days per case. The effect on the cost per patient day is not clear, but it is sometimes stated that the newer cases also use more intensive nursing care.

The sociological literature on hospital use describes a great variation in attitudes toward hospital care among different social groups. The evidence suggests that the increasing educational level and the spread of middle-class norms have stimulated demand both for beds and for higher apparent quality of care. Moreover, because the perceived role of the hospital has changed rather rapidly during the current century, there is also a substantial difference between the attitudes that persons in older age groups had a decade or two ago and the attitudes of persons in the same age groups today. More generally, the growing faith in the power of science, and of curative medicine in particular, accelerates the demand for technologically advanced methods of care.

The impact of hospital bed availability on the demand for care has been a subject of substantial controversy. The observation that the number of hospital beds per 1,000 population differs substantially among areas without any sizable effect on the occupancy rate has led to the proposition that the supply of beds "creates its own demand". This important statement is unfortunately ambiguous. Does it imply that an increase in the number of hospital beds will, all other things being equal, lead to an increase in the quantity demanded *because it depresses the price of hospital care?* If so. this notion of "supply creating demand" is no different from the traditional economic analysis in which a bountiful harvest or a large day's catch of fish would cause the price to fall until the quantity demanded was equal to the new quantity supplied. Or does the statement imply that an increase in the number of hospital beds shifts the demand schedule, i.e., increases the number of bed days of care demanded at every price? Such a "pure availability effect" would distinguish the market for hospital services from other markets. This is probably what at least some writers had in mind when they spoke of "demand" being increased by an increase in bed supply. Both interpretations are consistent

[9] The demographic index comparing 1968 and 1950 is defined as

$$\sum_i h_{i,63} P_{i,68} \Big/ \sum_i h_{i,63} P_{i,50}$$

where $h_{i,63}$ is the average number of hospital days per capita in 1963 for persons in age and sex group i, $P_{i,50}$ is the proportion of the population in that group in 1950, and $P_{i,68}$ is the proportion in 1968. The hospital use rates are reported by the National Center for Health Statistics.
[10] The changing demographic structure could, however, affect the nature of the demand for care per patient day.

with the observation that there is little, if any, relation between the percentage occupancy and bed availability, but neither is implied by it.

I have recently provided a direct test of the "pure availability effect" by estimating a demand function for hospital care in which both price and availability are explanatory variables.[11] This test clearly confirms that there is a pure availability effect as well as a price effect. It is not yet clear how such an availability effect actually operates. A relative scarcity of hospital beds may increase the waiting time for admission for elective procedures, encouraging patients to obtain ambulatory care or to do without treatment. Physicians may change their own criteria of when a condition "requires" hospital care and how long is "appropriate" for each type of case. This may be both a reaction (conscious or unconscious) to their perception of the shortage of hospital beds and a response to pressure from the hospitals themselves.

Of course, the notion that availability directly affects demand does not imply that an independent increase in the bed-to-population ratio would induce sufficient demand to maintain the previous percentage occupancy without a fall in price. Instead it implies that an increase in the availability of beds would not reduce the price at which demand and supply become equal by as much as the traditional analysis of demand would suggest. The significance of this implication is that a relatively large increase in the supply of hospital beds would be required to prevent an increase in the demand for hospital bed days due to other factors from causing excess demand; e.g., a 10% increase in the demand for bed days due to higher personal income would not be satisfied by a 10% increase in the number of beds if the greater availability itself induced a further increase in demand. This makes it more likely that price rises were necessary to prevent a growing excess demand during the period since 1950.

How Hospitals Respond to Increased Demand

Traditional economic theory describes the response of profit-seeking firms to shifts in demand. The conclusion of such analysis is that, in an economy composed of competitive profit-seeking firms, an increase in demand for a product will raise its price because of the higher average cost of producing a larger total quantity. If the firms have some degree of monopoly power, the analysis is more complex. One likely outcome is a higher price, including a greater monopoly profit per unit, even if average cost does not rise. These models of response to changing demand are irrelevant for hospitals in two distinct but related ways. First, hospitals are generally not profit-seeking institutions, and therefore they are not motivated to raise prices in an attempt to increase profits. Second, the traditional models ignore the change in product "quality" as a response to a shift in demand.

If hospitals are not motivated by profit maximization, what does determine their response to changes in demand? The most plausible answer is that subject to the constraint that they break approximately even, hospitals try to maximize the "quantity" of care that they provide. More specifically, when demand increases they try to provide more patient days of care and to raise the "quality" of care.[12] The reason for such behavior need not concern us. It may be that this is the appropriate professional and philanthropic response of institutions dedicated to providing medical care. It may be that administrators and medical staff get personal pleasure and prestige from being part of a larger organization and one that provides more sophisticated care. Or the growth in the hospital budget may be a way of increasing the fees that the medical staff can earn or the salary that administrators receive.[13]

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[11] M. S. Feldstein, "Hospital Cost Inflation", *American Economic Review*, December 1971.

[12] This type of assumption has been incorporated in formal models by Feldstein, *Economic Analysis for Health Service Efficiency: Economic Studies of the British National Health Service* (Volume 51 of *Contributions to Economic Analysis*) (Amsterdam: North-Holland Publishing Company, 1967). Newhouse, "Toward a Theory of Nonprofit Institutions: An Economic Model of a Hospital", *American Economic Review*, 60, 64–74 March, 1970, and Evans, *Efficiency Incentives in Hospital Reimbursement*, unpublished Ph.D. dissertation, Harvard University 1970. For some implications of a quite different assumption, that hospitals behave to maximize the personal income of the physicians on the staff, see Pauly, *Notes on a New Model of Non-Profit Hospital Behavior and Investment* (Mimeograph), Department of Economics, Northwestern University, 1969.

[13] This description of behavior applies to voluntary hospitals. Government hospitals are not bound by a break-even constraint and therefore do not respond to demand in the same way. It is likely, however, that they are constrained to keep their cost per patient day at approximately the same level as the voluntary hospitals in their area and that they seek to have similar staffing patterns, equipment, and other technical aspects of the production of care.

In the short run, hospitals cannot increase the number of bed days of care very much. Percentage occupancy can rise somewhat, but hospitals can expand the number of beds only with substantial delays. Even in the long run, most of the expansion of demand is channeled into higher cost per patient day rather than into more days of care. From 1950 to 1968, the number of days of care per person increased only 29 percent while the index of inputs per patient day [14] rose 105 percent. This increase in inputs takes many forms: more staff, more equipment, and more supplies, all of which can be used to increase the sophistication of treatment, to reduce uncertainty, to make patients more comfortable, etc. The relatively greater increase in inputs per patient day than in the number of days per capita reflects both patients' preferences and the choices made by hospital administrators and medical staff. If hospitals has chosen to expand the number of beds even more, patients would not have been willing to pay as large an increase in cost per patient day.

This description of the way hospitals respond to increasing demand should not be misunderstood. The preferences of the hospital administrators and medical staff do not completely determine the final response to changing demand. The structure of the local hospital care market, i.e., the number of hospitals among which the typical patient can choose, has an important influence on the extent to which patients' preferences dominate.[15] It lies beyond the scope of the current discussion to consider what combination of patients' preferences, external labor market pressures, professional standards, and administrative interests determines the actual mix of responses to increasing demand. Two aspects of this response, the change in technology and the rise in wages, are considered in

The Rising Cost of Hospital Care, Chapters 4 and 5

In concluding this appendix, it is useful to consider what explanations of hospital cost inflation could be developed *without* reference to increasing demand. There are two possible approaches. The first, which might be labeled the "productivity" explanation, is that the prices paid by hospitals for personnel, equipment, and supplies have been rising, while productivity (i.e., output-per-unit-of-input) has not increased as rapidly. This approach cannot explain why the cost per patient day has actually risen faster than input prices. Moreover, the increased number of hospital days per capita is not consistent with increased charges and a constant demand schedule. This suggests the second type of explanation: technical necessity. If the demand for hospital care is completely insensitive to price, hospitals can provide whatever care they consider to be technically appropriate or "necessary" and then charge the resulting cost per patient day. Although experts generally agree that price elasticity of demand is relatively low, both informal observations and specific statistical tests make the complete absence of price sensitivity seem unlikely.

The role of increasing demand for hospital care as the primary cause of the very rapid increase in cost per patient day is not generally understood or widely accepted. It is, however, more than a personal opinion based on casual speculation. The ideas discussed in this chapter have been incorporated into a formal statistical model with some allowance for changing technology and estimated with a combination of cross-section and time-series state data using annual observations for the period 1958 through 1968. The results support the verbal discussion that has been presented here.[16]

Appendix B

Estimation of Employer Contributions by Income Class

By Martin Feldstein and Elizabeth Allison

The estimates of employer contributions by industry are based on three sources: the biannual survey of employee benefits conducted by the Chamber of Commerce, the Bureau of Labor Statistics surveys of compensation practices and payroll hours and the compensation data published in July issues of *Survey of Current Business*.

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[14] This index uses average earnings per employee to measure labor costs and the wholesale price index to measure the price of nonlabor inputs bought by hospitals.
[15] Economists are well aware that, although firms in a competitive market respond to an increase in demand with the aim of increasing their profits, the final effect of a change in demand is to change the quantity produced and the unit cost but not the profits.
[16] M. S. Feldstein, "Hospital Cost Inflation", *American Economic Review,* December 1971.

1. The data for all manufacturing industries,[1] wholesale and retail trade, finance, insurance and real estate, utilities and communication is taken from *Employee Benefits 1969*

The published survey presents the average cost of insurance benefits (as per cent of payroll, cents per payroll hour, and dollars per year per employee) by industry for a composite item including life insurance premiums as well as health insurance. A special tabulation separating the two on an industry basis [2] was prepared for this survey: the figures for health insurance are presented in table 1 of the text.

The Chamber of Commerce sample is biased in that large firms are over represented. Inasmuch as most forms of supplementary compensation (like wage and salary levels) are correlated with firm size, users [3] of this data have generally adjusted benefit payments downward. However, Rice,[4] using 1959 and 1962 data, found no significant relationship between employer contributions to health insurance and the firm size and wage level. Therefore, no adjustments were made before using the results of the special tabulation as industry benefit data.

2. Data for contract construction, mining, transportation, and federal employment is based on Bureau of Labor Statistics studies of employee compensation and payroll hours.[5] This series of studies reports employer contribution as "life, accident and health insurance" as "cents per paid hour" and "per cent of total expenditures" for selected years. In order to make the Bureau of Labor Statistics data comparable to the 1969 manufacturing data, three adjustments were made.

First, an average percentage derived from the Chamber of Commerce tabulation was used to apportion the employer contributions between health and life insurance payments; the Chamber of Commerce data showed that about 82 percent of employer contributions to "life and health" insurance go to health in manufacturing industries and about 67 percent does in non-manufacturing industries. Second, to arrive at an annual contribution, the adjusted "cents per paid hour" was multiplied by 52 times the average work week for that industry.[6] The resulting annual contribution figure was then updated to 1969 by multiplying a factor of 11 percent per year elapsed between the year in which the study was made and 1969. The adjustment figure was derived from Bureau of Labor Statistics studies of compensation in the private, non-manufacturing sector.[7]

3. Comprehensive surveys of supplementary compensation practices for the service industries and for state and local government are not available.[8] In

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[1] The Chamber of Commerce tabulation does not provide separate estimates for "ordnance and accessories" and for miscellaneous manufacturing. Contributions for these two relatively small industries were estimated by fitting an equation relating average annual earnings and annual benefits, using the Chamber of Commerce data for all other manufacturing industries.

[2] The two items are not separated in the published report because a number of employers contract with one carrier to provide both life and health insurance for their employees and consequently were unable to furnish cost data for each item separately. The special tabulation indicated that 10% of the 1115 reporting companies had such dual coverage, and that their average costs (as a percent of payroll) for the combined life and health package of 3.7% was equal to the summed average for companies reporting separately. Consequently, it has been assumed that the pattern for companies reporting separately is representative of all companies.

[3] See, for example, Livernash, Robert E., "Wages and Benefits", in *A Review of Industrial Relations Research*, Vol. 1, Industrial Relations Research Association, 1970, pp. 79–144.

[4] Rice, R. G., "Skill, Earnings and the Growth of Wage Supplements", *American Economic Review*, Vol. LVI, May 1966, pp. 583–593.

[5] Studies used were, Bureau of Labor Statistics, *Building Construction*, Report 335–9, 1965; ———, *Mining*, Bulletin 1332, 1960; ———, *Air Transportation*, Bulletin 1571, 1964; ———, *Motor Passenger Transport*, Bulletin 1561, 1964; ———, *Railroads*, Report 335–3, 1965; ——— *Trucking*, Bulletin 1577, 1964; ———, *Water Transportation*, Bulletin 1577, 1964; *Employee Compensation and Payroll Hours in the Private Non-Agricultural Economy (production and non-production worker)*, Bulletin 1728, 1971. The final study referred to above provided comparative data on federal and private supplementary compensation practices. The annual contribution figure used for federal government employees is based on the reported number of employees in U.S. Civil Service Commission Bureau of Retirement and Insurance, *Fiscal Year 1968 Report*, Washington, D.C.: Government Printing Office, 1970.

[6] Bureau of Labor Statistics, *Handbook of Labor Statistics, 1970*, Washington, D.C.: Government Printing Office, 1970, p. 149.

[7] Percentage computed on basis of data contained in: Bureau of Labor Statistics, *Supplementary Compensation for Non-production Worker: Employee Expenditures and Practices*, Bulletin 1470, 1963; ———, *Employee Compensation in the Private Non-farm Economy, 1966*, Bulletin 1627, 1966; ———, *Employee Compensation and Payroll Hours, 1968*, Bulletin 1728, 1968. See also: Kolodruketz, Walter W., "Trends in Employee Benefit Plans in the Sixties", *Social Security Bulletin*, April 1971, pp. 21–36.

[8] The most comprehensive data available on supplementary compensation practices is contained in: Bureau of Census, *Census of Government*, Volume 3, No. 2, 1967. Data on health insurance coverage for state and local government employees is presented; however, the variance in plans is so great that contributions cannot be plausibly inferred from coverage data.

its absence, an indirect method of estimating employer contributions was devised. The Commerce Department publishes annual data on supplements to wages and salaries by industry division,[9] including the service industry and state and local government. Multiplying this by the ratio for all non-manufacturing industries of health contributions to total supplementary compensation provides an estimate of total employer contribution for an industry.

The estimate of total contributions for all employers is $7.3 billion. This is the Social Security estimate of $11.5 billion, including employee contribution.[10] Some discrepancy may result from the rule used for apportioning contribution between health and life insurance. Alternatively, if low wage employees typically receive health insurance first among supplementary benefits, the estimate for the service sector may be too low.

Employer Contributions for Married Women

Women make up over one-third of the labor force. Almost 65 per cent of these employed women are married.[11] Working wives require two modifications in the estimation of the distribution of health care supplement. First, a working wife implies that family income will be considerably higher than husband's income and the appropriate marginal tax rate will be higher. Second, and less obvious, is the effect on the distribution for health insurance subsidies. The problem arises as follows: A married woman who requires some variety of covered health care presumably has two choices: she can claim under the health insurance plan at her place of employment or she can submit a claim as a dependent under her husband's health plan. If employed wives generally apply under their own plan, families with more than one wage earner receive double subsidies. If they generally claim under their husbands' plans, the average contribution per employee understates the true subsidy being given to men employed in the industry.

We have assumed that women typically collect under their husbands' plans. There are three reasons for this assumption. First, about one quarter of the women [12] in the work force are part-time employees and as such not included under most group health plans. Second, the somewhat fragmentary evidence on turnover rates indicate that women's turnover rates are substantially higher. Thus, if there is some lag in coverage (as is typical for example in the service industry) a woman frequently may not have the option of presenting a claim at her place of employment. Finally, the health plan offered at a husband's place of employment is generally superior in terms of both breadth and depth of coverage. Across industries, health benefit payments are positively correlated with earnings, and male employment is concentrated in the relatively high-paying durable goods, manufacturing, mining, construction, and utilities industries, while the majority of female jobs are found in non-durable goods, manufacturing, services and retail trade, all low-wage industries.

To adjust for this assumed claims behavior of married women, in industries in which more than 10 percent of employees are women the average benefit level used in intermediate calculations has been adjusted upward. We assume that married women are distributed in the same way among industries as all other women; thus 65 percent of the women employees in each industry as assumed to be married. Then the adjustment for the industry is given by:

$$B_i = \frac{B'_i N_i}{N_i - 0.65\ N_{wi}}$$

where

B_i = estimated average benefit in industry i
B'_i = reported average benefit in industry i
N_i = total employment in industry i
N_{wi} = employment of women in industry i.[13]

To obtain the relevant income distribution of beneficiaries by income class within an industry, the industry income distribution for married women was

[9] U.S. Department of Commerce, *Survey of Current Business*, July 1970, Table 6.7, "Supplement to Wages and Salaries by Industry Division, 1969," and Table 3.3, "State and Local Government Receipts and Expenditures: Compensation of Employees."
[10] Walter Kalodruketz, "Employee-Benefit Plans in 1969," *Research and Statistics Note*, Social Security Administration, April 5, 1971.
[11] Woman's Bureau, *Handbook on Women Workers*, Bulletin 294, Washington, D.C. U.S. Government Printing Office, 1970, p. 112.
[12] Ibid., p. 12.
[13] Data on women's employment by industry is taken from Bureau of Labor Statistics, *Employment and Earnings*, Vol. 16, No. 9, March 1970, pp. 52–58.

subtracted from the overall industry income distribution.[14] What remained was an income distribution by industry for married men and unattached individuals.

Relationship of Earned Income to Family Income

The relevant tax rate for a household depends not on the annual earnings of the head of the household, but on total income, the sum of husband's and wife's income (for married workers) and any unearned income. An estimate of total income was derived from the earnings of the head of the household in a two-step process. In the first step, the earnings of married men were matched with earnings of their wives on the basis of the joint distribution of husband-wife earnings presented in *Current Population Survey*.[15]

The second step was to move from earned income for both families and unrelated individuals to total income. Data from a Federal Reserve Survey[16] was used to compute an average unearned income for each husband-wife income combination, some 120 different groups. No attempt was made to construct a similar table for unmarried individuals. Instead, it was assumed that the unearned income received by an unmarried employee was equal to that received by a married employee of the same earnings class with a non-working spouse.

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[14] The income distribution for all women on an industry basis was obtained from U.S. Bureau of Census, *Current Population Survey, 1970,* Series P–60, No. 75. Washington: U.S. Government Printing Office, 1971.

[15] U.S. Bureau of Census, *Current Population Survey, 1970,* Series P–60, No. 75. Washington: U.S. Government Printing Office, 1971.

[16] Projector, Dorothy S. and Weiss, Gertrude, *Survey of Financial Characteristics of Consumers.* Washington: Board of Governors of the Federal Reserve System, August 1966.

THE MANDATORY OIL IMPORT QUOTA PROGRAM: A CONSIDERATION OF ECONOMIC EFFICIENCY AND EQUITY*

By Charles J. Cicchetti and William Gillen**

INTRODUCTION

Oil import quota schemes have been a subject of controversy among policymakers and economists for at least two decades. A landmark in the policy discussions is the Report of the Cabinet Task Force on Oil Import Control, issued in February 1970. At the time the report was issued, however, the controversy was somewhat muted by events abroad which reduced the price differential between imported and domestic oil as a result of the increased cost of imported oil. The closing of the Suez Canal, the disruption of oil flowing through a pipeline in Syria, oil embargoes in North Africa and a united negotiating front by the Oil Petroleum Exporting Countries (OPEC) all contributed to increased transportation and other costs for imported oil. As a result, domestic oil supplies became more attractive and the impact of the import quota system diminished.

These influences, however, were basically shortrun, and at present are being countered by other factors which reduce uncertainty and tend to restore equilibrium in the international petroleum industry. World tanker tariffs are returning to equilibrium. Contracts have been signed between the petroleum industry and Oil Petroleum Exporting Countries (OPEC) which establish prices that will prevail until 1975.[1] While Alaskan oil fields (which are the center of their own controversy) seem closer to development, reasonable projections of demand for petroleum products exceeds even this considerable increase in do-

¹ Actually posted prices, whose meaning we will define below were established. The actual prices paid for foreign oil are treated secretly by the exporting country and the petroleum industry. Therefore, for the purposes of determining royalty payments and taxes, a posted price is negotiated and used by the parties involved.

EDITOR'S NOTE.—This research was completed in the spring of 1973. Since that time two sweeping changes have taken place. In the summer of 1973 the President announced the end of the subsidy described in this paper. A few months later the Middle East war broke out and the United States was held at political bay by the world's oil producers. Many, including the authors of this paper, attribute our refining shortage and political vulnerability to the MOIQ program described in this now outdated analysis. There are two lessons to learn. First, the costs of society when government enters into a market and competition is reduced may be far greater than the wedge in relative prices that it creates and which are the subject of the following discussion. Lost jobs, a reduced national security posture, the lack of adequate refining capacity are the additional factors which can be attributed to the MOIQ program. Second, now the whole world is paying a higher price for oil in part due to the lack of competition created by the MOIQ. Present policy makers have chosen a highly touted path called "project independence". While a return to an MOIQ is unlikely the present authors fear that future subsidies and protection of these new domestic energy sources will be likely. The irony is that we have learned so little from the mistakes discussed in the succeeding paper that we seem dedicated to the task of imitating them at the expense of energy consumers, the environment and even national security.

mestic supply. Our attention is again drawn to foreign sources of supply; and the effect of an import quota becomes more apparent, more acute, and more deserving of renewed examination.

The purpose of this paper is, first to review the historical development of the Mandatory Oil Import Quota Program and to describe the manner in which it presently functions. Second, we will review several analyses made during and shortly after the Cabinet Task Force Report, and update these to reflect changing market conditions. Finally, we will analyze the equity and efficiency aspects of the present program in the context of its objectives, and consider alternative means of achieving those objectives.

I. HISTORICAL PERSPECTIVE [2]

The first U.S. experience with oil import quotas was in the 1930's under the National Industrial Recovery Act. Although the act was declared unconstitutional in 1935, the competitive position of the United States was a net exporter of oil until 1948. By 1955 that position has eroded—due largely to major oil finds in Venezuela and the Middle East—and a Cabinet Advisory committee recommended the use of voluntary oil import restraints to maintain the 1954 ratio of imports to domestic production.[3] The Office of Defense Mobilization thereupon established the "First Voluntary Program" and requested oil companies to reduce imports from outside the Western Hemisphere by 7 percent. This program failed to prevent an increase in net imports as a number of companies began to import for the first time.[4]

In 1957 the first, informal program was replaced by *"The* Voluntary Program." This program set import quotas for four petroleum districts (I to IV). District V was exempted from control (see figure 1). Three classes of importers were designated:

(1) Importers (established, larger volume importers);

(2) Small importers (lower volume importers with no existing record of imports prior to 1954);

(3) Newcomers (firms with no existing record of imports).

The allocation of quotas among classes was basically historical. This aspect of the program was significant in two respects. First, it was carried over (with modification) to the Mandatory Oil Import Program. Second, it contributed to the collapse of The Voluntary Program.

Whether any voluntary quota program could succeed, no matter what its form and structure, is a matter of speculation; but an essential element is that the participants in the program, i.e., the importers and potential importers, regard the allocation of quotas as generally equitable.[5] Is an historical allocation equitable? Quota allocations are highly profitable to those who possess them. Quota allocations to historical importers are, in fact, rewards to persons for having imported oil when there was no restriction on importing oil. For that situation to be regarded as fair or just one would want a statement, sanctioned

[2] For a comprehensive discussion of the historical, legal and political aspects of the Mandatory Oil Import Quota Program, see Kenneth W. Dam, "Implementation of Import Quotas: The case of Oil," *Journal of Law and Economics,* January 1971, pp. 1–60. Section I is based in large part on Dam's important study.

[3] *Report* of the Cabinet Task Force on Oil Import Control, February 1970, 3 (Hereafter "*Report*").

[4] *See* Dam, *supra* note 2 at 6.

[5] It is also desirable that they respect the objectives of the program, and believe the program reasonable capable of achieving those ends. This is a question of program efficiency, which we defer for consideration under the Mandatory Program.

Figure 1. PETROLEUM ADMINISTRATION FOR DEFENSE (PAD) DISTRICTS
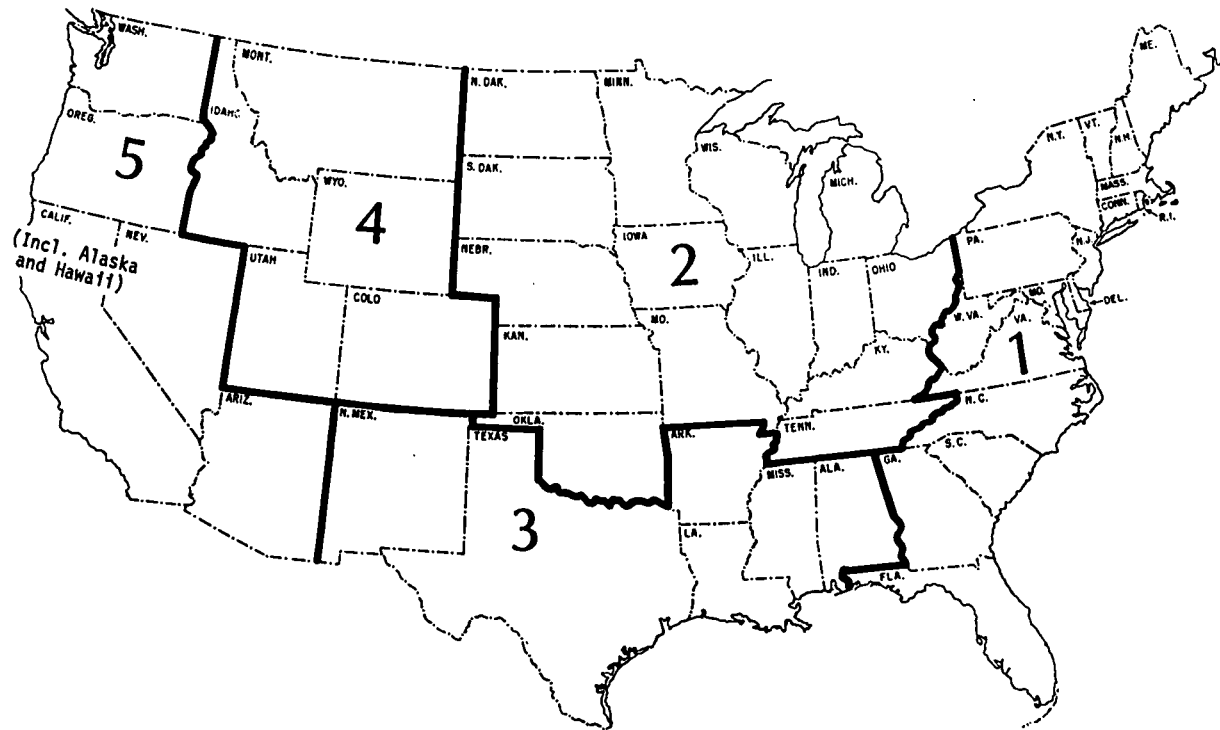
Source: Bureau of Mines, Mineral Industry Survey, Final Summary, 1969.

in law, that it was public policy to show preference to that select group. Of course, no such preference is supposed to exist. Moreover it is not the case that alternative allocation procedures are difficult to conceive of. For example, quotas might be allocated according to refinery capacity, or willingness to pay for the privilege of importing, with revenues going to the general tax base rather than oil company profits. We conclude that allocation of quotas according to historical levels of imports by specific firms is arbitrary, not equitable, and an inherent weakness of the both voluntary program and its immediate successor, the Mandatory Program.

The Voluntary Program survived until 1959. Kenneth Dam, previously cited, notes four reasons for the breakdown of the Voluntary Program:

(1) Noncompliance. The Voluntary Program had no enforcement mechanism [6] and simple noncompliance was widespread.

(2) Newcomers. Any quota system sets up a two-price system, i.e., domestic and foreign. The more effective the quota, the greater the attraction of the foreign-priced commodity. Firms without import allocation duly responded: Requests from "newcomers" for quota allocations, plus requests for increased allocations for existing importers would have more than doubled their current imports.

(3) Products. The Voluntary Import Program applied only to crude oil. Products refined from crude oil were not controlled. One would expect importers to avoid the quota by shifting to refined produces instead of crude oil; as indeed they did. Residual fuel oil imports quadrupled between 1956 and 1958. Imports of unfinished oils increased 6700% from 1957 to 1958.

(4) Antitrust. The Voluntary Program was said to be in disfavor within the Justice Department Antitrust Division. One company even offered fear of violating the antitrust laws as a basis for noncompliance.

II. The Mandatory Oil Import Quota Program

In 1959, by presidential proclamation, the Voluntary Program was replaced by the Mandatory Oil Import Quota Program.[7] The Mandatory Program was established on the grounds "that crude oil and the principle crude oil derivatives and products are being imported in such quantities and under such circumstances as to threaten to impair the national security." [8] The threat sought to be eliminated is a dependence of the United States on foreign oil supplies such that the United States would be left without adequate domestic supplies should those foreign supplies for any reason not be available to the United States. Given restricted imports the domestic oil industry would be encouraged to locate and develop domestic supplies. A corollary purpose "is to prevent imports from causing a decline in the petroleum sector of the U.S. industry that would so weaken the national economy as to impair the national security." [9]

The Mandatory Program applied to both crude oil and refined products.[10] As under the previous program there are actually two separately

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[6] The Buy America Act was invoked with respect to suppliers to the U.S. Government, but was not an unqualified success.
[7] Presidential Proclamation 3279, reprinted at *Report, supra,* 197.
[8] *Id.*
[9] *Report, supra,* 115.
[10] The program distinguishes 1) crude oil, 2) unfinished oils, 3) finished products and 4) residual fuel oil to be used as fuel. Except for residual fuel oil, all unfinished oil and finished products are, in effect, carved out of the crude oil quota. For details, see Report, supra, 9 or Dam, supra, 15.

administered schemes, Districts I–IV (east of the Rockies), and District V (west coast). Initially the quota set the maximum level of crude oil and products at approximately 9 percent of total demand as estimated by the Bureau of Mines. Product imports were not to exceed 1957 levels. In 1962 the quota changed from a demand basis to a production basis by which the maximum level of imports was set at 12.2 percent of domestic production. This rule continues to apply, except in District V where the quota is variable, being equal to the shortfall of combined District V plus Canadian production relative to total demand in District V.

Among refineries quotas ("tickets") are allocated as a per cent of refinery inputs, subject to two modifications, a swap arrangement and a finagle factor. These are discussed in order:

(a) The sliding scale. Refineries are allocated quotas according to the volume of domestic inputs. The greater the volume of inputs the greater the *total* quota allocation, but the smaller the allocation as a *per cent of total* refinery inputs. Table I is the scale applicable in 1969. The percentages and classes by volume vary year to year depending on; (1) total imports available for allocation, and (2) changing policy objectives and preferences.

TABLE 1

Average barrels per day of inputs	Percentage allocation districts I–IV	Percentage allocation district V
1st 10,000	19.5	40.0
Next 20,000	11.0	9.3
Next 70,000	7.0	4.1
All additional	3.0	1.9

Source: Adapted from report, supra, 12.

(b) Historical minimums. Tickets allotted to any refinery under the sliding scale are subject to a minimum allotment according to the firm's last allocation under the Voluntary Program. These historical minimums are gradually being reduced and eliminated.

(c) Exchanges. Quotas may not be sold, but may be exchanged for domestic crudes or unfinished oils.[11] This permits inland refiners and others not in a position to refine imported crudes to realize most of the value of their allotment. The dollar value of quotas to firms is easily determined from the ratio at which firms exchange domestic oil for foreign. Petrochemical firms, which receive quotas although they do not use crude oil as input, rather crude derivatives, exchange their allocation for feedstocks.

(d) Manipulation of allocation computations. Again, the principle factor in determining allocations to specific firms is the volume of a given refinery's inputs, such that quota allocations are a positive function of input volume. Thus, the larger the input "base," the larger the quota allocation. It is this "base" that is manipulated. The reasoning underlying this procedure is this: Certain imports are exempted from the quota either as the result of implied or expressed policy preferences or because there is no justification for restricting them given the program's "national security" basis.[12] On the other hand, it is desired

[11] Exchanges between District V and Districts I–IV are prohibited.
[12] For example, quite secure Canadian sources of supply. This and other exceptions to the program are discussed in detail below.

to mitigate the price attractiveness of these non-domestic sources. Consequently, certain imports which are not subject to the quota may not be counted as refinery inputs for purposes of determining quota allocations. To the extent then that a refinery uses low cost exempt imports, in place of domestic inputs, its quota allocation is reduced.

III. Exemptions and Preferences

If the Mandatory Program is complicated by the procedure described above, it becomes positively *intricate* with a web of "exemptions" and "preferences" that may delight lawyers and confound the public.

(*a*) Overland shipments. Quota exemptions are granted to imported oil shipped overland to the U.S., i.e., from Mexico and Canada.[13] Overland transport, however, is not an attractive mode for shipping the relatively modest authorized quantities (30,000 barrels per day) of Mexican oil, thus giving rise to "El Loophole" or "The Brownsville U-Turn." This was an arrangement whereby Mexican oil was shipped by tanker to Brownsville, Texas. The oil was landed in bond and transferred to trucks. The trucks crossed the Rio Grande into Mexico and immediately recrossed the border. The oil was then released from bond and shipped by tanker to the East Coast, whereupon it was construed to have arrived overland. This bit of nonsense, which had been devised as a matter of expediency relating to short-haul Venezuelan crudes, was discontinued in January 1971 when what amounted to a country-of-origin quota was assigned to Mexico.[14]

"On the other hand, the ["maritime overland"] exemption has not been extended to shipment from Canada across the Great Lakes or to rail shipments from Canada to Ketchihan in southern Alaska because of a short inland waterway crossing by rail car ferry.[15] The potential volume of lower cost Canadian crudes threatened to become "a gaping hole in the Mandatory Program through which could eventually flow enough crude oil to cause the Program to flounder.[16] To protect the program, and a the same time maintain the credibility of the program's "national security" basis, Canadian crudes were initially excluded from the refinery input base for detering quota allocations. Presently, they are subtracted from the total amount of crude oil that is permitted to flow into Districts I to IV. Both rules made Canadian crude considerably less attractive. The problem of how to treat Canadian crudes is yet more complex: The so-called "Northern Tier" refiners had been built in the U.S. along the Canadian border in anticipation of using Canadian oil. To reduce the competitive disadvantage that would otherwise have been imposed on these refineries, they were granted higher historical allocation, but this higher allocation was also reduced at a more rapid rate than for other refineries. The treatment of Canadian oil can give one a feel for the awkwardness inherent in attempting to meet vaguely defined objectives via a quota system.

(*b*) The sliding scale and the historical minimums described above themselves embody an implied set of preferences. The sliding scale favors smaller refineries by a considerable margin over larger. The historical minimum is subject to the same criticisms attributed to the

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[13] Subject to intergovernmental agreements as to quantities.
[14] Allocation of the Mexican quota to U.S. refineries is left to Pemex, the Mexican National petroleum company.
[15] *Report, supra,* 10.
[16] Dam, *supra,* 29.

principle under the Voluntary Program. Although, this appears to be a preference more tenuously held since it is being eliminated in stages.

(c) Petrochemicals. The oil import quota program is an attempt to distort the allocation of resources that a free market would otherwise direct. This distortion reverberates through the economy, affecting persons, commodities, industries and prices that are outside the target area of the original decision to intervene in the market process. These secondary impacts may run counter to other, equally pressing, national objectives. The Mandatory Oil Import Quota Program and the petrochemical industry is such a case.

The petrochemical industry uses certain products of the petroleum industry as feedstocks. The Mandatory Oil Import Quota Program, by maintaining domestic prices higher than the world price detrimentally affects the international competitive position of the petrochemical industry.[17] The petrochemical industry is a major contributor to the U.S. balance of payments (net exports in excess of one billion dollars in 1971).[18] To ameliorate deleterious balance of trade effects, quota tickets were assigned directly to certain petrochemical firms, albeit in a rather unsystematic manner, i.e., "through what is in effect negotiation between the industry and government officials." [19] Several problems arise in determining how the petrochemical industry should share in the quota program.

What portion of the total quota should be allocated to the petrochemical industry? This involves, among other problems, identification of the industry. Petrochemicals, of which there are several hundred, are manufactured both by oil companies and chemical companies. The administrative solution was to designate as "petrochemical plants" those which converted by chemical reaction more than 50 percent by weight of total plant inputs to petrochemicals. According to this formula a plant which converted 49 percent of its inputs to petrochemicals was not a petrochemical plant; whereas the plant which converted 99 percent of inputs was no more of a petrochemical plant than its 51 percent cousin. Once over the 50 percent qualification marker the ratio of inputs to petrochemical output did not matter, and allocations were based on *total* inputs, i.e., petrochemical feedstocks and everything else that constituted plant inputs.

If the input basis for allocation is unsatisfactory, an output basis is no more convenient. Petrochemicals vary widely by weight and volume and are not easily, if at all, comparable. Clearly, the situation of the petrochemical industry under the Mandatory Oil Import Quota Program is ripe for revamping, but we see nothing in the present program or in its development that suggests that a consensus will be reached among the industries, government, and the public.

(d) Puerto Rico and the Virgin Islands. Both Puerto Rico and the Virgin Islands have been brought within the import quota system to the extent that they are generally prohibited from becoming loopholes in the import quota system. However, several petroleum refineries have been given additional allocations and the right to export into the continental United States when the direct effect of such action was to create additional employment and spur economic de-

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[17] And, of course, all other industries with petroleum.
[18] Census Reports (FT 410 and FT 246), Bureau of the Census, Washington, D.C. February 1972.
[19] *Report, supra,* 13.

velopment, and the companies additionally agreed to pay a per barrel fee into a special conservation fund.

(e) Low sulfur bonus. In 1967, a presidential proclamation authorized the additional allocation of crude oil on a bonus basis to firms manufacturing low sulfur content residual fuel oil in the United States specifically to meet local pollution abatement requirements.[20] Under this authorization, District V has been granted several of these bonuses under different conditions. Bonuses in Districts I to IV have been granted, suspended and generally not acted upon. However, another type of allocation has occurred in Districts II to IV in which allocations for the importation of low sulphur residual fuel were granted directly to electric utilities in 1970. Later in the year, terminal operators in District I who were in the business of shelling No. 2 residual fuel oil were also granted allocations directly for the importation of residual fuel made from Western Hemispheric crude.

IV. AN ANALYTICAL DESCRIPTION OF DOMESTIC CRUDE OIL MARKET STRUCTURES

A. "District V"

In order to determine the social costs of the Mandatory Oil Import Quota Program a brief discription of the market structures that result from this program is important.

In PAD District V, domestic production is fully protected from foreign competition up until an agreed upon domestic price in these states. This price depends upon the quality of various crude oils. If the quantity of oil demanded exceeds the quantity of oil supplied by domestic plus Canadian producers, then foreign oil is permitted to enter District V to meet the excess quantity demanded in this district at the historical domestic price. It is important to note that Canadian producers are not completely free to import unlimited quantities of crude oil, since they are restricted by the existing throughput capacity of the Trans-Mountain Pipeline which transports oil from Edmonton to Puget Sound. Finally, inter-district flows of oil from states east of the Rockies into District V have been negligible. This is of course necessary, if the practice of operating two district programs is to continue.

Figure 2 depicts diagrammatically the effect of these market restrictions on the supply function and the equilibrium price in District V. Let S^v_d be the marginal cost curve of domestic producers as well as Canadian producers. At a price of P_d per barrel the quantity of oil demanded exceeds the quantity of oil supplied by an amount equal to Q_F. This is the amount of foreign oil, which is permitted to be imported into District V. The supply curve for foreign oil (S^v_F) is perfectly inelastic for amounts in excess of Q_F as imports are restricted to that quantity. This is true even if the marginal cost of foreign oil in amounts greater than Q_F is lower than domestic cost (for simplicity we have assumed that the marginal and average costs of foreign oil are equal).[21]

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[20] *Report, supra,* 14 and Dam, K., *supra,* especially pp. 40–41.
[21] Since a large proportion of the cost of foreign oil is tanker costs and royalty taxes, the assumption that marginal and average costs are equal is probably close to being accurate.
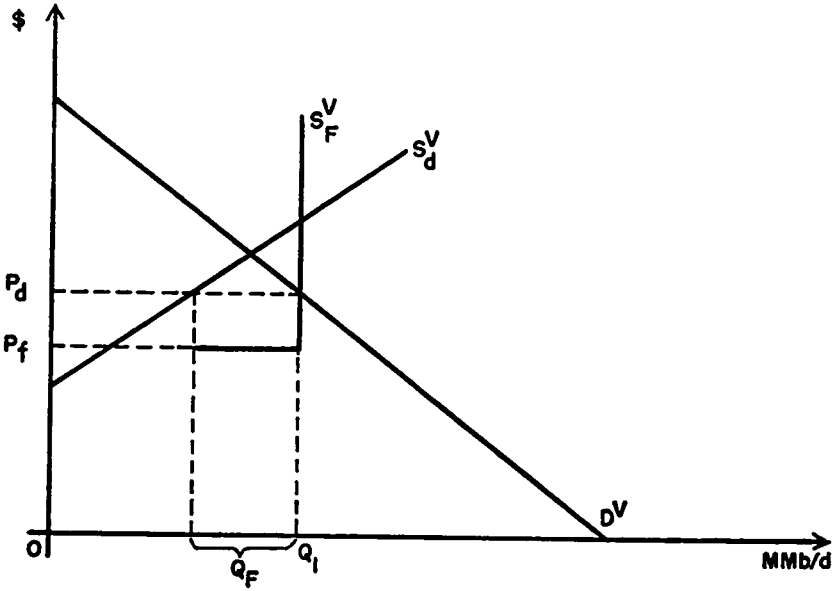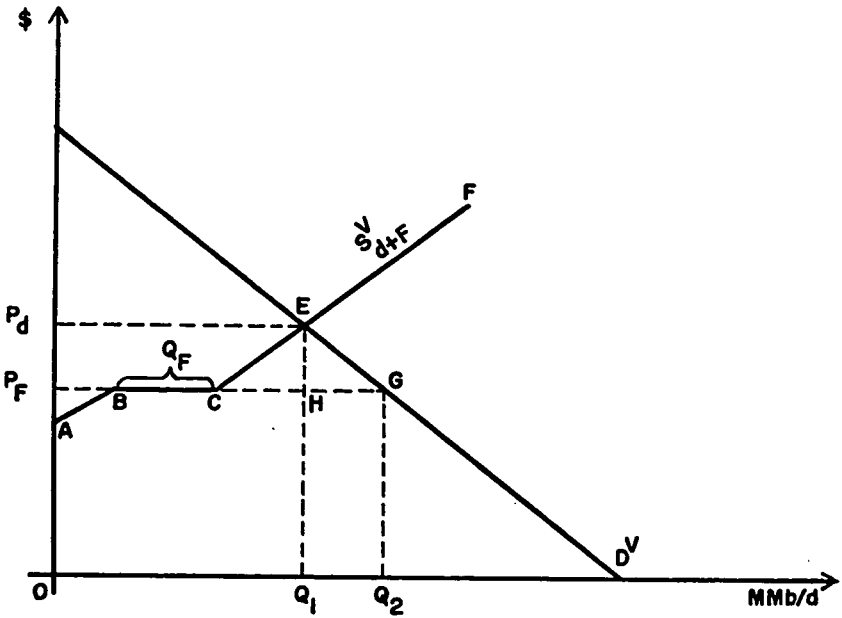
Figure 2.   DOMESTIC AND FOREIGN SUPPLY SCHEDULES

Figure 3.   DEMAND AND SUPPLY DISTRICT V

The resultant market supply schedule under district V's quota system is the function defined by segments A, B, C, E, F, in figure 3. If quota restrictions were removed and all foreign oil had costs represented by the completely elastic portion of the S^v_F curve in figure 2, equivalently segment B–C in figure 3, the new market equilibrium point would be reached at point G. Quantity would increase from OQ_1 to Q_2 and price would decline from P_d to P_f. This latter free market situation would result in a decline in domestic production at the same time total consumption increased, since some domestic oil would not be competitive at the world price (=cost of foreign oil). The economic efficiency gains would have two components: first, the costs of supplying that quantity which is consumed with the quota system in effect would be decreased by an amount represented by area CEH. Second, consumption would increase and prices fall yielding consumer benefits represented by area HEG. Looked at in another way the present quota system has social costs associated with it equal to the sum of these two components, or area CEG.

B. "East of the Rockies"

The supply curve of crude oil east of the Rockies, that is PAD Districts I to IV, is derived somewhat differently. First, the amount of crude oil and product imports (except residual fuel oil) is restricted to 12.2 percent of domestic production. Second, Canadian crude is treated as an import and must be subtracted from the total oil import allocations. Third, domestic oil is restricted by a system of state demand prorationing restrictions.

The effect of the domestic restriction is that the individual marginal cost curves of each producing well, field, or firm can not simply be added horizontally as we normally assume to be the case in a competitive industry. Instead, each producing unit is assigned a certain allowable level of production per month. The result is that some low-cost wells are sometimes idle, while higher-cost wells are producing. Firms will produce from each well the allowable quantity of oil as long as the marginal costs of a barrel of oil are less than the market price. Consequently, the domestic supply function is usually above the function that would prevail in the absence of pro-rationing restrictions. It is important to note that a "100 percent allowable" is not the same as maximum efficient productive capacity. Therefore, even when allowable levels of domestic production are set at "100 percent" levels, the level of domestic production will be less than the situation that would occur if prorationing restrictions were removed entirely. Furthermore, under such circumstances the cost of production will also exceed the production costs that would be expended in the absence of prorationing. As a result of prorationing there is a loss in economic efficiency, a higher price paid by consumers, and a lower quantity of oil consumed in each time period. Offsetting these deleterious economic effects, it is averred that more domestic oil is ultimately recovered than would otherwise be the case.[22]

[22] Although a discussion of the pros and cons of prorationing is stepping somewhat outside the main purpose of the present discussion, it is important to note that systems, which will preserve the economic efficiency rule at least cost production and maximization of the ultimate recoverable crude oil have been discussed at great lengths elsewhere. The practice is called unit field production. The interested reader should see Davidson. P. "Public Policy Problems of the Domestic Crude Oil Industry", *American Economic Review*, March 1963, 53, 85–108.
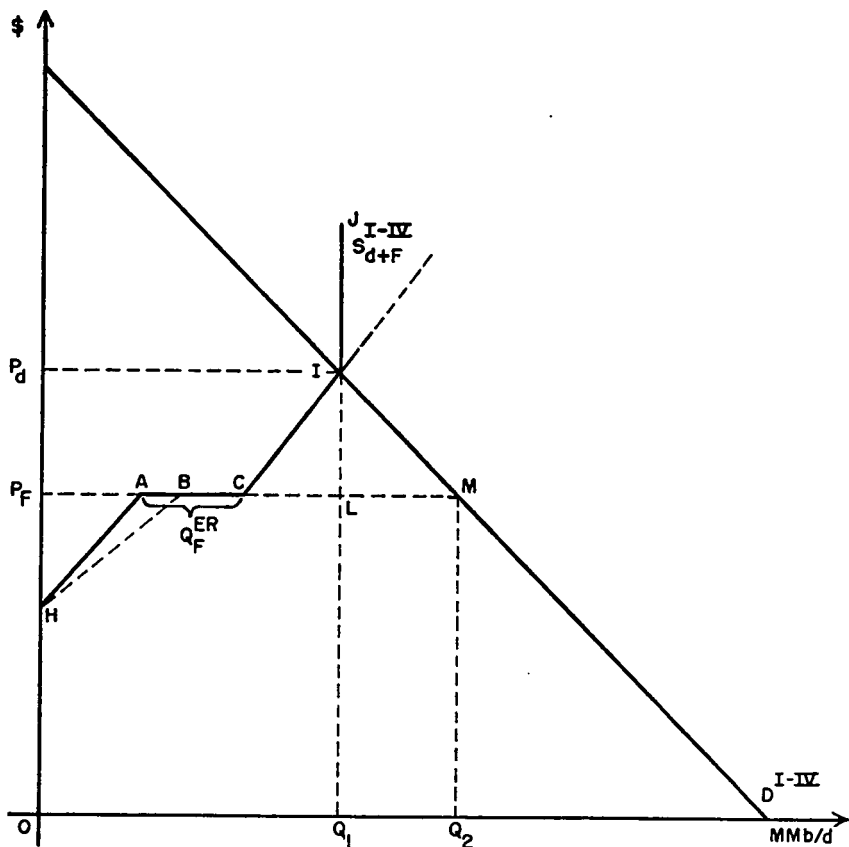
Figure 4. DEMAND AND SUPPLY EAST OF THE ROCKIES

In figure 4, we show the supply curve for Districts I to IV that would be derived by horizontally adding the domestic supply curve (with the market demand prorationing restrictions) and the foreign supply curve (which is assumed to include Canadian crude oil and to be based upon constant marginal cost). We label this market supply curve $S \dfrac{I\text{-}IV}{d+F}$ and to avoid confusion, the exact labeling of the various segments that make up $S \dfrac{I\text{-}IV}{d+F}$ is HABCIJ. The fact that domestic supply is restricted by quota and prorationing to the equilibrium quantity, Q_1 minus the quantity of foreign oil, $Q \dfrac{ER}{F}$, results in an inelastic supply curve for both domestic and foreign oil at the equilibrium level, as indicated by the IJ segment.

Prorationing and the quota system east of the Rockies depend upon one another to be effective. If the quota system were to be removed, it is unlikely that the prorationing system as it is presently operated would be viable, since lower cost foreign oil supplies would misplace prorationed domestic supplies. To the extent that this is true, removing the quotas east of the Rockies would reduce the cost of producing some domestic crude oil. This would be represented by area HAB in figure 4. Additionally, a substantial portion of the crude oil transported into east coast ports is presently carried in U.S. tankers, due to the restrictions of the Jones Act.[23] Since these tankers are more costly than foreign tankers, displacing domestic crude in east coast ports will yield another gain to economic efficiency in the form of reduced costs.

A second component of benefits that would result from removing quotas would be the cost savings that might accrue from displacing higher cost domestic crude oil with lower cost domestic crude oil at the present level of consumption. The cost saving results from a breakdown of the state prorationing system which, as noted above, depends on the quota program for its effectiveness. This component would be represented by area HAB in figure 4. Finally, since reduced price would be likely to result in increased consumption there would be additional consumer benefits represented by area LIM.

C. Market Composition

In tables 2 and 3, we show the actual effect of the market restrictions described above on the quantity of oil supplied to different U.S. markets in 1970 by source of supply. The somewhat surprising result is that with very different formulas for setting the level of imports, the ratio of imports to domestic production was the same in both regions of the country in 1970 at 12.2 percent (despite a broader definition in District V, which includes the Trans-Mountain throughput, which is considered safe for National Security purposes).

TABLE 2.—DISTRICT V SOURCES OF SUPPLY IN 1970

[Thousands of barrels per day]

	Daily total	Cumulative daily total
District V production	1, 304	1, 304
Other domestic sources	193	1, 497
Canadian overland (exempt)	220	1, 717
Venezuela	100	1, 817
Persian Gulf	115	1, 932
Indonesia	100	2, 032
Less exports to Southeast Asia (Taiwan)	(78)	1, 954

Ratio of net foreign imports less 50 barrels of Indonesian supply to district V plus Canadian exempt supply (100+115+50−78) over (1,304+220) equals 12.2 percent.
Total actual imports (except Canada), 237 over (domestic production in district V plus Canadian production), 1,524 equals 15.6 percent.
   Total actual imports, 457 over domestic production in district V, 1,304 equals 35.0 percent.

Sources: Bureau of Mines, U.S. Department of Interior, "Mineral Industry Surveys," Washington, D.C. (various year-end summary issues) such as December 1968, December 1969, 1969 final summary and June 1971) . . .; and Office of Oil and Gas, Map and Summary of International and Interregional Flows of Crude Oil in 1970, Washington, D.C., 1971.

Nationally the actual imports of oil were slightly more than 30 percent of domestic production in 1970. However, only a small percentage

[23] Jones Act (Common Name), 46 USC 861 et seq. (1964).

(4.2 percent) of domestic consumption in 1970 came from North Africa or the Persian Gulf. And about half of this came from the non-Arab country of Iran. Given the national security justification of the Mandatory Oil Import Quota Program, the fact that only about two percent of the consumption in the United States comes from this relatively *insecure* part of the world should be noted.

This statement is not made to minimize the prospects of future dependence on Persian Gulf sources of supply as U.S. demand increases. (We show some recent forecasts in Appendix B). In fact there are several reasons why the Persian Gulf area (especially the non-Arab country of Iran) may become a major source of U.S. oil. First, the other industrialized countries of the free world, most notably western Europe and Japan have an even faster rate of growth in demand than the U.S. These areas, too, will compete for secure, non-Arab sources of supply, which cannot be expected to meet the entire free world demand. Second, the production costs in the Persian Gulf are among the lowest. Additionally, a growing world oil tanker industry is making advances in: (1) improved speed, (2) efficiency and (3) capacity, which tend to reduce the transportation costs of these more distant sources of supply. Finally, the prospect of increasing taxes and demands for participation and/or ownership by host countries in the petroleum operations and profits, means that foreign oil is more valuable for the Nation and the oil industry today than at some point in the future.

TABLE 3.—"DISTRICTS I TO IV SOURCES OF SUPPLY IN 1970"

[Thousands of barrels daily]

	Daily total	Cumulative daily total
Districts I to IV production	10,007	10,007
Other domestic sources	24	10,031
Other domestic outflows	(193)	9,838
Canada (includes 35 above the 1970 annual limit set by President Nixon)	430	10,268
Mexico	45	10,313
Caribbean (includes 34.8 to Puerto Rico outside the system)	1,550	11,863
Other Western Hemisphere	225	12,088
Free Europe	120	12,208
North Africa	220	12,428
West Africa	80	12,508
Middle East via pipeline	25	12,533
Middle East via the Cape of Good Hope	260	12,793

Sum of foreign imports less 1,513 in residual fuel oil, less Canadian above the limit (35), less exports (142), and less Puerto Rico (34.8) divided by domestic production in districts I to IV, 1,222 over 10,007 equals 12.2 percent.

Total actual imports 2,955 over domestic production in districts I to IV, 10,007 equals 29.5 percent.

Sources: Bureau of Mines, U.S. Department of Interior, "Mineral Industry Surveys," Washington, D.C. (various year-end summary issues) such as December 1968, December 1969, 1969 Final Summary and June 1971) . . .; Interregional Flows of Crude Oil in 1970, Washington, D.C., 1971.

V. ESTIMATING THE SOCIAL COST OF THE MANDATORY OIL IMPORT QUOTA PROGRAM

By using the analytical descriptions of the domestic markets for crude oil, which were described in the previous section and the prices, costs and supply schedules presented in table 4 and appendices A, B, and C, respectively, we can determine our estimate of the social cost, amount of subsidy and equity effects of the present Mandatory Oil Import Quota Program. These calculations will be made at two points in time year end 1970, the last year for which adequate actual data is

available, and 1975 using various forecasts and different assumptions about 1975. Separate calculations will also be made for each of the two separately regulated domestic markets, district V and the east of Rockies market or districts I–IV.

A. The Impact of Quotas in District V

At year end 1970 the average price of crude oil was $3.43 per barrel in District V. The price that would be expected if quotas were dropped would be the world price or $2.42 per barrel. Since oil consumption in 1970 was about 1.95 million barrels per day or about 713 million barrels per year in District V, the total subsidy from consumers of oil to producers of domestic oil and refiners of foreign crude oil was about $720,000,000 in 1970. ($1.01 x 713 million barrels).

TABLE 4.—1971 CRUDE OIL PRICES IN VARIOUS MARKETS

Market	Quality	Source	Price per barrel
New York	30–30.90 API	Louisiana South plus gathering costs of 14 cents and transportation of 45 cents.	$4.14
Los Angeles	30–30.90 API California sulfur range 1 to 2 percent.	Signal Hill plus gathering and transportation costs of 5 cents.	3.43
Chicago	26–26.9° API	Louisiana South plus gathering costs of 9 cents and transportation of 25 cents.	3.89
South Louisiana (Wellhead).	30–30.90 API (less than 0.5 percent sulfur).	Platt's Crude Oil Summary, Aug. 25, 1971.	3.55
Tokyo	Average of all crudes imported	Platt's, Aug. 19, 1971	1.83
Canada (eastern)	Average of all crudes imported	Platt's for Apr. 1, 1971 listings	1.98
Venezuela			2.08
West Germany	Average of all imports	Platt's as of May 1971	3.03
United Kingdom	do	Platt's as of June 1971	2.74
Australia	do	do	1.53

Note: All prices are based upon data published in recent editions of "Platt's Oilgram Price Service," with U.S. prices based upon crude oil supplement of Aug. 25, 1971, vol. 49, No. 164–B. Costs are based upon the "Cabinet Task Force" (1970), for Chicago and New York and the State of Alaska (1971), and Tussing, et al. (1971).

To determine the amount of domestic oil that is produced at real costs in excess of the foreign crude alternatives, we can use the supply schedule derived in Appendix C, and the real cost of foreign crude. A "without quota" point of reference for the latter is the price of Persian Gulf crude less federal excise tax, i.e. $2.31. The domestic crude price at year end 1970 was $3.43 per barrel. At the 1970 level of consumption, about 550,000 barrels per day, and a difference in real costs of $1.12 per barrel, we can calculate the first component of social costs— corresponding to the triangular area CEH in figure 3. These costs equal the amount of resources that are needlessly expended to produce the same quantity of crude oil at the current price and can be calculated by:

$$\text{social costs (component 1)} = \frac{1}{2} \frac{\$1.12}{\text{barrel}} \frac{550,000}{\text{day}} \frac{365 \text{ days}}{\text{year}}$$

$$\approx \$112,000,000 \text{ per year}$$

If it is assumed that the slope of the demand schedule is equal to the slope of the supply schedule (in terms of elasticity in equilibrium this implicitly assumes the two have an elasticity of about 1.1), then we can also calculate the social costs that result from foregone consumer surplus. Since a higher price and lower quantity are caused by restricting competition this is a real loss to society. Assuming the slopes of

demand and supply are equal means that the social cost of this second component equals the first or $112,000,000 per year. Should the oil supply schedule be less elastic in equilibrium than demand this is an underestimate of the second component of social cost, and vice versa.

. To calculate the size of the subsidy and social costs of the Mandatory Oil Import Quota Program in 1975 we can use the same approach but several variables may be expected to change in value. In Appendix A are estimated the future cost and price of foreign crude using the presently contracted crude price increases and an assumption that new technology will reduce the transportation costs of foreign crude oil. The expected price and real cost of foreign crude are $2.30 and $2.19 per barrel for these assumptions in District V in 1975. If the present tanker technology is not improved costs will not fall and for this assumption the foreign price and real costs are expected to be $2.48 and $2.59 per barrel in District V in 1975.

The level of consumption is estimated to grow to 2.4 MMb/d in 1975 in District V. We will calculate social costs and the size of the subsidy for two different cases. First we will assume that domestic production will not increase, since domestic prices will be assumed to be fixed at their year end 1970 level. Therefore, under this first case all new demand will be supplied by foreign crude oil. Under this case social costs of component 1 will change only slightly from their 1970 level, increasing if new technology in transportation is implemented and vice versa if current technology is unchanged. Since demand has grown we are certain that the second component of social costs, foregone consumer surplus benefits will be greater in 1975 than as estimated in 1970. We can therefore be conservatively certain that the 1970 estimate of total social costs, $224,000,000 per year in District V will be an underestimate of 1975 District V social costs.

On the other hand we are reasonably certain, even assuming that District V prices are fixed, that the size of the subsidy from consumers to oil companies will increase, since the total annual consumption was forecast to increase. Using new tanker technology the price of foreign crude oil was expected to fall in 1975 relative to 1970, this will also increase the size of the subsidy. However, with the old technology tankers, foreign crude prices will increase thus tending to offset the growth in consumption. Using the same approach as outlined above, the 1975 District V subsidy—assuming domestic prices are constant—can be calculated as:

New Tanker Technology $\dfrac{2.4 \text{ million barrels}}{\text{day}} \dfrac{365 \text{ days}}{\text{year}} \dfrac{(\$3.43-\$2.30)}{\text{barrel}}$

$\approx \$990$ million per year

Old Tanker Technology $\dfrac{2.4 \text{ million barrels}}{\text{day}} \dfrac{365 \text{ days}}{\text{year}} \dfrac{\$3.43-\$2.59)}{\text{barrel}}$

$\approx \$753$ million per year

An alternative method to meet growth in demand would be for domestic supply to expand in response to an increase in the domestic price of crude oil. Using the supply schedules derived in Appendix C, we can determine that the price of domestic crude oil would have to increase by about 90¢ per barrel in order for domestic production to ex-

pand to meet the expected growth in demand. This means that the 1975 price would increase to $4.33 per barrel in District V. Under this case both the social costs and size of the subsidy will increase significantly relative to the 1970 estimates. Using the same procedures as before social costs and subsidies can be calculated as follows:

Social Costs
Component 1

$$\frac{\text{New Tanker}}{\text{Technology}} \quad \frac{1}{2} \quad \frac{(1.0 \text{ million barrels})}{\text{day}} \quad \frac{365 \text{ days}}{\text{year}} \quad \frac{(\$4.33-\$2.19)}{\text{barrel}}$$

$$\approx \$391 \text{ million per year}$$

Assuming equal elasticities of supply and demand, component 1 equals component 2 and total social costs equal $782 million per year.

$$\frac{\text{Old Tanker}}{\text{Technology}} \quad \frac{1}{2} \quad \frac{(1.0 \text{ million barrels})}{\text{day}} \quad \frac{365 \text{ days}}{\text{year}} \quad \frac{(\$4.33-\$2.48)}{\text{barrel}}$$

$$= \$338 \text{ million per year}$$

Assuming equal slopes for demand and supply total social costs equal about $676 million per year.

Subsidy

$$\frac{\text{New Tanker}}{\text{Technology}} \quad \frac{(\$4.33-\$2.30)}{\text{barrel}} \quad \frac{2.4 \text{ million barrels}}{\text{day}} \quad \frac{365 \text{ days}}{\text{year}}$$

$$= \$1.78 \text{ billion per year}$$

$$\frac{\text{Old Tanker}}{\text{Technology}} \quad \frac{(\$4.33-\$2.59)}{\text{barrel}} \quad \frac{2.4 \text{ million barrels}}{\text{day}} \quad \frac{365 \text{ days}}{\text{year}}$$

$$= \$1.52 \text{ billion per year}$$

The subsidy and social costs calculations presented above for district V in 1970 and 1975 are summarized in table 5.

B. *The Impact of Quotas East of the Rockies*

By making use of the analytical model described in section IV, the prices, costs levels of consumption described in the attached appendices a methodology similar to that used for District V can be applied to Districts I to IV. In order to apply such a procedure average domestic and foreign prices must be calculated due to the difference noted above for the three principal east of the Rockies' markets, New York, Chicago, and the Gulf coast. Using 1970 regional consumption estimates there are derived as follows:

Region	Consumption (percent)	Price (per barrel)	Foreign real cost[1]
New York	46	$4.14	$2.31
Chicago	32	3.89	2.56
Gulf	22	3.55	2.31
Average	100	3.93	2.39

[1] Foreign price equals $2.50 per barrel.

TABLE 5.—SUMMARY OF THE SOCIAL COSTS AND SUBSIDY OF THE MANDATORY OIL IMPORT QUOTA PROGRAM IN DISTRICT V IN 1970 AND 1975

[In millions of dollars]

	Annual costs	
	Social costs	Subsidy
1970_____	224	720
1975:		
(a) No domestic price change all new demand met by foreign crude:[1]		
(1) Old tanker technology[1]_____	219	733
(2) New tanker technology[1]_____	234	990
(b) No increase in foreign crude inports, domestic price increase of 90 cents per barrel:		
(1) Old tanker technology_____	676	1,520
(2) New tanker technology_____	782	1,780

[1] Rough estimates based upon the change in real costs per barrel.

The demand in Districts I to IV in 1970 was 12.8 million barrels per day. Of this total about 3 million barrels were imported each day. Using the supply schedule derived in Appendix C, we can determine that about 4 million barrels of domestic crude were produced at costs below the average real cost of foreign crude, or about $2.39 per barrel. In 1975 demand in Districts I to IV is expected to grow to 15.6 million barrels per day at current prices. We consider two cases: First, the situation in which all the increase in domestic consumption comes about without a price increase due to an increase in foreign imports of 1.0 million barrels of oil per day and an increase in domestic production in Alaska all of which is assumed to be supplied to the oil short markets east of the Rockies markets at real cost below the cost of foreign crude oil. We assume therefore that Alaskan oil will supply about 1.8 million barrels per day in 1975. An equivalent to this case is to assume that all the new demand is supplied by low-cost foreign crude with no increase in domestic price.

Alternatively, we consider a case in which demand prorationing restrictions are relaxed to permit an increase in domestic production to meet an increase in domestic price. Under this case we assume that foreign imports will remain at their 1970 level and calculate the size of the price increase required to expand domestic output by 2.8 million barrels per day, i.e. about $0.48 per barrel; thus the 1975 price would be $4.41 per barrel. Interestingly, the Oil and Gas Journal of May 10, 1971 published a forecast of $4.50/bbl by 1980. The size of the subsidy and social cost table were calculated for these two cases in 1975. The calculations are summarized in table 6. Note that the resource costs of the Jones Act and state prorationing are not included in the social cost estimates. However, since both contribute to higher prices east of the Rockies we must not attribute the full subsidy from consumers to oil companies to the Mandatory Oil Import Quota Program. In the case of the Jones Act, which would be a subsidy from consumers to the domestic maritime industry, we can determine the approximate percentage of the subsidy that is due to this restriction. The average price difference between domestic and foreign crudes is about $1.50 per barrel. An outside estimate of the extra cost of transporting domestic crude due to the Jones Act is 25¢ per barrel. About 50 percent

of the crude east of Rockies might be affected by the Jones Act, therefore something less than 1/12 $(=\dfrac{.25}{1.50}\times\frac{1}{2})$ of the subsidy calculated in table 6 should be attributed to the maritime industry, the remainder goes to oil companies and is due to the joint restrictions of supply caused by the Mandatory Oil Import Quota Program and State Demand Prorationing.

TABLE 6.—SUMMARY OF THE SOCIAL COSTS AND SUBSIDY OF THE MANDATORY OIL IMPORT QUOTA PROGRAM IN DISTRICTS I TO IV IN 1970 AND 1975

[In billions of dollars]

	Annual costs	
	Social cost	Subsidy
1970	3. 26	6. 68
1975:		
(a) No domestic price increase expand Alaskan production and foreign inputs:		
Imports:		
(1) Old tanker technology [1]	2. 96	7. 20
(2) New tanker technology [1]	3. 56	8. 85
(b) Domestic price increases by 48 cents per barrel to expand domestic production outside of Alaska:		
(1) Old tanker technology	5. 88	9. 90
(2) New tanker technology	6. 80	11. 56

[1] Approximate adjustments to reflect changes in tanker technology. Note also that part of the decline in social costs is due to supplying east of the Rocky markets with low cost Alaskan crude at the rate of 1,800,000 barrels per day in 1975.

TABLE 7.—SUMMARY OF THE SOCIAL COSTS AND SUBSIDY OF THE MANDATORY OIL IMPORT QUOTA PROGRAM FOR THE NATION IN 1970 AND 1975

[In billions of dollars]

	Social cost	Subsidy
1970	3. 5	7. 4
1975:		
(a) No domestic price increase:		
(1) Old tanker technology	3. 2	7. 9
(2) New tanker technology	3. 8	9. 8
(b) Domestic price increase:		
(1) Old tanker technology	6. 6	11. 4
(2) New tanker technology	7. 6	13. 4

C. National Totals and Policy Implications

Table 7 summarizes the social cost and subsidy calculations for the Nation in 1970 and 1975. It is noteworthy that both the program's social costs and its resultant subsidy are expected to increase quite significantly in 1975 relative to 1970. Also if domestic price increases are used to hold the percentage of foreign crudes down to levels approximately equal to their present levels both values can be expected to almost double in 1975 relative to 1970.

On the other hand current (1972) administration policies are answering short run growth in demand by gradually increasing the amount of foreign imports.[24] Since this is a gradual addition to supply the affect of the supply restrictions in keeping the price high will be undiminished. Present policies, which will result in an increase in

[24] See reports published during the summer of 1972 in the *Washington Post, Wall Street Journal,* and other sources of Nixon Administration plans to selectively increase oil import quotas on an interim basis.

foreign dependence in any case will result in greater social costs and subsidies, and could be replaced immediately by a dropping in foreign restrictions thus preventing further inefficient use of resources of more than $3 billion per year and consumer subsidies of about $9 billion per year.

The policy which seems more likely given the past history of the industry-government regulations in the oil industry, is for some increase in domestic price to prevent a loss of markets to foreign competition. If this alternative is selected the present social costs and subsidy will nearly double in the five years from the publication of the Cabinet Task Force study and 1975. The program would require the expenditure of nonproductive resources of about $6 billion in 1975 under this latter case. It is useful to compare such a cost with this the intended benefit of the program, national security. The Cabinet Task Force calculated that as an alternative to the quota system oil equal to a one year supply of foreign consumption could be purchased and stored in either steel tanks or salt domes. It estimated the costs of such alternatives at 40¢ to 73¢ for the former and 19¢ to 45¢ for the latter. Assuming that about 30 percent of the total consumption would be imported in 1975. This means that even if the cost of storage was to increase to $1.00 per barrel of annual equivalent of foreign crude, storage still cost less than $2 billion per year and save from about $1.5 to $4.5 billion per year in real resources.

Considering the second justification of the Mandatory Oil Import Quota Program, protection of domestic production, it should be noted that this could be accomplished in a more equitable manner. First, a tariff program could replace the current quota program. This would keep the domestic price high but transfer some of the subsidy now going from consumers to the treasury rather than to oil companies. This would reduce the need for new taxes in 1975 by about $4 billion and still leave the industry subsidized for its domestic production since prices would be kept high.

A tariff would also make the price in Los Angeles and New York the same for foreign crude oil. At the present time prices are some 70¢ per barrel higher in New York due to the Mandatory Oil Import Quota Program in conjunction with state demand prorationing and the Jones Act. This inequity that falls most reavily on east coast consumers would be removed by a Federal tariff applied equally to all foreign crude oil imports. The separate schemes now used under the present two part quota system could be replaced by an equally applied tariff.

In closing it should be noted that if the costs of the present program as described above are considered too large relative to the benefits of the program, i.e. natural security and protection of domestic production from competition, then a final policy alternative would be to drop the Mandatory Oil Import Quota Program entirely and allow the competitive laws of the free enterprise capital system, unfettered by bureaucratic decisionmakers, to determine the resultant market price and quantity of oil. Such a decision would save from about $3.25 billion to $7.5 billion per year in real resources in 1975 and result in savings to consumers of about $8 billion to $13.5 billion per year in 1975.

APPENDIX A

COST OF THE ALTERNATIVE SOURCE OF SUPPLY

To calculate the real cost of a foreign crude oil, a specific reference crude, Iranian Light 34° API, has been selected. In table A–1 this cost is derived. In determining the real cost of foreign crude oil to the United States taxes paid to foreign governments represent real costs for the United States, while taxes paid to governments within the country are monetary transfers. The reason for this conclusion is that payments made by oil companies to different state treasuries reduce the welfare of oil company owners, but this is offset by benefits to taxpayers. Such transactions are usually considered transfers of income within an economy rather than real resource costs. When tax payments are made to residents of another country, this is not the case. At some point in the future, such tax receipts may be used to demand real goods or services from the U.S. economy, and as such, would represent real costs to this country. Therefore unless a world efficiency perspective which took into account comparative advantages as opposed to a national efficiency perspective, were to be adopted, such a levy by oil producing countries must be considered real costs to the importing economy.

TABLE A–1.—AVERAGE COSTS FOR PERSIAN GULF OIL DELIVERED TO U.S. COASTAL PORTS

[Dollars per barrel]

	Iranian light 34° API (1.4 percent sulphur)	
	1971	1975
Production [1]	$0.10	$0.11
Payments to foreign governments [2]	1.11	1.27
Other costs [3]	.30	.30
FOB arms length price	1.51	1.68
Transportation costs [4]	.74	.45
Total cost to United States (delivered)	2.25	2.13
U.S. tariff	.105	.105
Delivered price	2.36	2.24
Average price for early 1970's	2.30	

[1] See: M.A. Adelman, forthcoming manuscript to be published under the tentative title, World Petroleum Markets, no attempt to relate this figure to the specific crude shown in this table has been made. Adelman's calculation is best viewed as an overall average.

[2] See: August 25, 1971 issue of Platt's Oilgram Price Service and June 21, 1971 issue of the Oil and Gas Journal for crude, price postings in 1971 and 1975. Payments to Foreign Governments are based upon a 49 percent of posted price calculation, which has been approximately determined by Mikesell for Iran. See Mikesell, R.F., Foreign Investment in the Petroleum and Mineral Industries (Baltimore: The Johns Hopkins Press, 1971) (especially p. 247).

[3] These costs are used to include all other costs transportation and gathering and payments made to determine the FOB arms length price. In a submission to the cabinet task force, the New England Council, et. al., estimated this FOB price to be $1.30. At the old posting of $1,80 and Adelman's production costs of 10¢, this would mean a difference of 30¢ ($1.30–$1.00 (=.10+½ ($1.80))), which we denote as other costs.

[4] We show a high and low cost for transportation to be consistent with the cabinet task force calculations. It should be noted that the New England Council, et al., used a figure of 57¢. This would imply a $2.11 delivered price to the U.S. east coast, up 24¢ since their 1969 estimate.

Tariffs paid to the U.S. Treasury (approximately 10.5¢ per barrel) are monetary transfers. Accordingly, by subtracting U.S. taxes and including taxes paid to producing countries, the real cost of a barrel of oil, using Iranian Light (34° API, 1.4% sulfur) as a reference crude, is $2.13 in 1975. An additional adjustment is necessary to make the Iranian Light reference crude comparable to the quality of domestic oil that will be used for comparison purposes (30° API) (degree API). This means that the average cost of the lighter Iranian crude would be $2.07 per barrel.

Appendix B

Production and Consumption Forecasts

TABLE B-1.—DOMESTIC PRODUCTION FORECASTS

[Million barrels per day]

	IPPA	CTF
Well head price $3.50 per barrel: [1]		
1970 production (acutal) [2]	11.3	11.3
1980 production (estimated)	15.6	14.1
1975 production (straight line estimate)	13.5	12.7
Well head price $2.50 per barrel: [1] 1975	8.0	9.7
Well head price $2 per barrel: 1975	5.25	8.2

[1] Joint Economic Committee, Report on Crude Oil and Gasoline Price Increases of November 1970: A Background Study, U.S. Government Printing Office: Nov. 3, 1971. Ap P, prepared by the Independent Petroleum Association of America (IPAA). Note CTF refers to the cabinet task force, supra.
[2] See tables 2 and 3 above.

TABLE B-2.—PRODUCTION BY REGION IN 1975 UNDER DIFFERENT PRICE AND PRODUCTION ASSUMPTIONS [1]

[Million barrels per day]

Average well head price	National	Districts I–IV	District V
IPPA production schedule:			
$3.50	13.5	11.9	1.6
$2.50	8.0	7.1	.9
$2	5.25	4.65	.6
CTF production schedule:			
$3.50	12.7	11.2	1.5
$2.50	9.7	8.6	1.1
$2	8.2	7.2	1.0

[1] Joint Economic Committee, supra, Nov. 3, 1971. The regional estimates in this table are based on an assumption that the elasticity of supply of petroleum is the same in all regions of the country. IPAA is the Independent Petroleum Association of America. CTF is the cabinet task force.

TABLE B-3.—CRUDE OIL CONSUMPTION FORECASTS BY REGION OF THE COUNTRY [1]

[Million barrels per day]

Year	National	District			
		I	II	III and IV	V
1970 [2]	14.75	5.9	4.1	2.8	1.95
1975 [3]	18.0	7.2	5.0	3.4	2.4
1980 [4]	22.0	8.8	6.1	4.2	2.9

[1] 1970 National and district V and I–IV totals based on values shown in table 2 and table 3 above.
[2] The district I to IV breakdown is based upon the breakdown found in: Timenes, N., "Analysis of Transportation Alternatives," ap. C, "An Analysis of the Economic and Security Aspects of the Trans Alaska Pipeline," Washington, D.C.: U.S. Department of Interior, December, 1971.
[3] The 1975 estimates were based upon the 1970 actual consumption data and 1980 forecasts. The same regional consumption patterns that existed in 1970 were assumed to continue.
[4] The 1980 national forecast is based upon the median case found in Gordon, R.L., "Analysis of Future Demand for Crude Oil," appendix C, pt. 1, "An Analysis of the Economic and Security Aspects of the Trans Alaska Pipeline." Washington, D.C.: U.S. Department of Interior, December 1971. The middle case assumes an average annual rate of nearly 5 percent per year and a compound exponential rate of 3.8 percent per year. The latter was used to estimate the 1975 levels of consumption.

Appendix C

Derivation of Regional Supply Schedules [1]

NATIONAL

	IPAA	CTF

$$\frac{\Delta \text{ Quantity}}{\Delta \text{ Price}} = \frac{(13.5-8.0)\,\text{MMb/d}}{(\$3.50-\$2.40)} \qquad \frac{(12.7-9.7)\,\text{MMb/d}}{(\$3.50-\$2.50)}$$

$$= \frac{550,000\text{b/d}}{10\cancel{c}} \qquad\qquad \frac{300,000\text{b/d}}{10\cancel{c}}$$

Average of IPAA and CTF

$$\frac{\left(\dfrac{550,000\text{b/d}}{10\cancel{c}} + \dfrac{300,000\text{b/d}}{10\cancel{c}}\right)}{2} = \frac{425,000\text{b/d}}{10\cancel{c}}$$

REGIONAL

1970 Production
    National=11,335,000 b/d
    District V=1,304,000 b/d
    District I–IV=10,031,000 b/d

    Percent District $V = \dfrac{1.304 \text{ MMb/d}}{11.335 \text{ MMbld}} = .115$

    Percent D strict $I\text{–}IV = \dfrac{10.031}{11.335} = .885$

    Slope District V=.115 (425,000 b/d/10¢) ~50,000 b/d/10¢
    Slope District I–IV=.885 (425,000 b/d/10¢) ~375,000 b/d/10¢
1970 Market Equilibrium
    District V
    Price=$3.43 per barrel
    Quantity=1.95 MMb/d
    Domestic Quantity=1.5 MMb/d
District I–IV: New York, Chicago, Gulf.
Average Price=46% (4.14)+32% (3.89)+22% (3.55)=$3.93 per barrel
Quantity=12.8 MMb/d
Domestic Quantity=9.8 MMb/d
Supply Price $= a+b$ (Quantity Supplied).
        SP $= a+b$ (QS).
        b $=$ slope.
        a $=$ 1970 Equilibrium Price—b (Equilibrium Quantity).

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[1] Joint Economic Committee, supra; November 3, 1971. The regional estimates in this table are based on an assumption that the elasticity of supply of petroleum is the same in all regions of the country. IPAA is the Independent Petroleum Association of America. CTF is the Cabinet Task Force.

District V

$$b_v = 1/\frac{\Delta \text{ Quantity}}{\Delta \text{ Price}} = \frac{\Delta \text{ Price}}{\Delta \text{ Quantity}} = \frac{10\cancel{c}}{50,000 \text{ b/d}}$$

$$a_v = \frac{\$1.00}{500,000 \text{b/d}}(1,500,000 \text{b/d}) = \$.43$$

District V Supply Schedule

Supply Price$_v = .43 - \dfrac{1}{500,000 \text{b/d}}$ Quantity Supplied

Districts I–IV

$$a_{I\text{-}IV} = \frac{\text{Price}}{\text{Quantity}} = \frac{10\cancel{c}}{375,000 \text{b/d}}$$

$$b_{I\text{-}IV} = \$3.93 - \frac{\$1}{3,750,000 \text{b/d}}(9,800,000) = \$1.32$$

District I–IV Supply Schedule:

Supply Price I–IV $= 1.32 - \dfrac{1}{3,750,000}$ Quantity Supplied

APPENDIX D

ESTIMATING THE AVERAGE REAL RESOURCE COSTS OF A BARREL OF CRUDE OIL IN 1970 [1]

(Millions of dollars)

I.:
Exploration	$2,287
Development	2,631
Production	3,236
Overhead	825
Total	8,979
Less production taxes	−857
Total	8,122
Add 10 percent opportunity cost of capital	+812
Total costs	8,934

II. Annual average daily production 11.3MMb/d [2] ×365 days=4.125 billion barrels.

III. Allocation of total cost of oil and gas production to oil:

High oil cost case [3]	Low oil cost case [4]
Average Cost per Barrel of Oil $= \dfrac{.875\ (\$8,934\ \text{million})}{4.125\ \text{billion barrels}}$	$\dfrac{.65\ (8,934\ \text{million})}{4.125\ \text{billion barrels}}$
Approximate Average Cost Per Barrel of Oil $=\$1.90$	$\$1.40$

[1] Source of cost data is: American Petroleum Institute, et al *Joint Association Survey of the U.S. Oil and Gas Producing Industry,* Washington, D.C., November 1971.
[2] 1970 domestic production data is found in tables 2 and 3 above.
[3] Splitting cost of production in the ratio of 7 to 1 for oil to gas was suggested to me as an industry rule of thumb by C. S. Overmiller, Chief Economist for Humble Oil and Refining Company, Houston, Texas.
[4] Splitting cost of oil and gas 65% oil and 35% gas is based upon an assumption made in a Joint Economic Committee Background Study, JEC, *supra,* November 3, 1971.

AN EVALUATION OF SUBSIDIES FOR WATER POLLUTION ABATEMENT

By Hugh H. Macaulay[*]

I. Conditions Leading to the Granting of Subsidies

A. *Public Disaffection With Water, and Environmental Quality*

Goods that people receive may be divided into two broad categories based on the means whereby they are produced. Private goods are normally supplied by private producers and the individual who buys such a good pays the cost of its production and is generally the only one who benefits from the good. The purchase of a car, a shirt, or a table would be an example. Public goods, on the other hand, are consumed by many people once they are provided to one person; and because of this interrelation of consumers, such goods are customarily provided by government and financed by taxes. If a criminal is apprehended, this benefits not only the immediately intended victim but also future possible victims; if a fire hydrant is put by one house, all houses within a given distance also benefit.

A problem arises, however, with respect to some private goods. In their production or consumption, some innocent third parties may be affected, either favorably or unfavorably. For example, when a mill produces steel, pickling liquors are created as a byproduct and must be disposed of in some way. The most economical way of doing this in the past has been to dump this liquid into streams and rivers to let it mingle with other liquids as they all flow to the sea. Or, to move

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to an example perhaps more closely akin to consumption than production, as a group of people choose a site on which to settle and establish a town or city, they, too, create a byproduct, sewage, that must be disposed of in some way, lest the site become unhealthy and uninhabitable. These citizens, in searching for ways to handle the problem, have evaluated the options in the same way as have the steel mills. The most economical solution, from the standpoint of the citizens of the city, has been to discharge their wastes into a nearby stream and let nature solve the problem. As of 1969, for example, New York City was still discharging over 300 million gallons of raw sewage a day into its harbor [12, *N.Y. Times*, 1969, p. 56].

The people living downstream from these mills and cities saw the situation in a far different light. As all of these byproducts came drifting by their farms, homes, cities, and factories, their welfare and ability to enjoy life was reduced. Since water arrives on Earth in a pure state and this condition had been altered by upstream users to the disadvantage of downstream residents, the logical conclusion and solution seemed to be to reduce, and preferably prohibit, upstream actions that would damage those who live downstream and wish to use water in a clean and pure state. All of this is familiar, even to children in the lowest grades of elementary school. They constantly admonish their parents to avoid despoiling the environment, and they frequently correspond with the editors of the local papers voicing their concern about their chances for survival until graduation time if pollution of air, water, and land is not eliminated promptly.

With such an obvious and so simple a problem, it was only natural that something should be done to prohibit the discharge of wastes into the environment. But things that appear obvious are sometimes not so obvious when they are examined in greater depth. This seems to be true with pollution.

B. Water Pollution and Its Causes

1. ECONOMIC EXTERNALITIES

The nature of the problem just described is also familiar to economists and is regularly discussed under the headings of "economic externalities" or "social costs." It has long been bothersome and was an obvious impediment to an efficient allocation of scarce resources. It was clear, for example, that if a mill bought land, labor, and capital to produce steel and sold it at a price that covered these costs, the product was underpriced. The smoke from the steel mill may have dirtied Mrs. Murphy's overalls as they hung out to dry on a neighboring clothesline, or the gases in the smoke may have peeled the paint off the nearby houses. These, too, are costs of producing steel, and the purchaser should pay them or else steel will be underpriced and overproduced. Solutions that were proposed included enacting restrictions on the output of the steel mill and levying taxes on the output of steel. In each case, the output would be reduced and the price would be raised.

Within the last decade, however, the problem has been viewed differently. Ronald Coase observed [6, 1960] that when economic externalities occurred, the question was not how should they be prevented but rather which of the two parties affected would gain most if he could

continue to do what he wanted. Would Mrs. Murphy gain more by drying her (husband's) overalls if she could get clean air [1] or would the steel mill have the larger gain if it could get rid of its soot and ash by sending it up the smokestack?

The point has been made even more explicit by writers who have cast the problem in a different but more familiar framework. Specifically, what is at issue is the use of a scarce asset [Cf. 2, Boyd, 1967]. In the example just cited it is air quality, and the question is who should be entitled to make use of it. How valuable is the air for the purposes to which Mrs. Murphy wishes to put it, in drying overalls with a clean fresh smell, and how valuable is the air to the steel mill when used as a modern Egyptian barge, floating across the sky and transporting not the Pharaoh to worlds beyond but the mill's byproducts to some nearby or far-flung shore? The concept of air as an asset that might be used by one person or another is strange to modern man because throughout history air has been sufficiently plentiful for everyone to have all that he wanted. It had no fences or walls around it to restrict users from having access to it, and it has generally been considered as common property belonging to and available to everyone.

But even this is not quite all the story. Is the best solution one where the mill gets to use the air in whatever way it wishes and poor Mrs. Murphy has to live with that solution; or is it where Mrs. Murphy gets the high quality clean air that she wishes and poor United States Steel is limited to zero-pollution emissions? Both theory and practice indicate a different solution is desirable and should be sought. Just as the diamond-water paradox plagued economists for centuries, so the problems associated with air and water pollution have troubled modern economists and noneconomists, but each problem depends on the same principle for its solution.

The diamond-water question was sometimes posed as an indication of justifiable humility as the questioner sought a solution to the conundrum. "Which is more valuable, diamonds or water?" It is clear that water is vital to the survival of the human race, while diamonds are not, and so water must have the higher value. Yet to anyone who has entered the markets of man it is equally apparent that diamonds command a far higher price than water, and this must reflect their higher value. The solution arose with the discovery, or invention, of marginal analysis, which noted that the value of any product depended on how much one more unit of it would fetch. Thus, water, while vital to survival, was so plentiful that another gallon contributed almost nothing to improve human welfare and commanded a price commensurate with that contribution. The reader can complete the picture with his own analysis of diamonds.

This principle has universal application and helps explain why individuals do not buy limitless quantities of food, clothing, or shelter. It also should be considered in determining what to do about environmental quality. Mrs. Murphy should certainly want air that will not be poisonous to the human body so she can breathe it safely. She will still be anxious, but probably less so, to have air that will not peel the paint from her house every three years. Other uses of air could be to dry the clothes we have so often referred to, but here a home dryer might prove

[1] If Mrs. Murphy has neighbors who are also affected, then other parties are involved and their wishes must also be taken into account. The point is discussed further on page 1022.

an adequate and inexpensive substitute; and air that will be clear enough for her to see the neighboring mountains on each of the forty days a year when it is not raining, snowing, foggy, or hazy with particulates cast off by one or more of the Earth's oft-erupting volcanoes will be even less important to her.

The mill is faced with a similar, but opposite, set of circumstances. It can remove impurities from its emissions, but, as in nearly all other aspects of human existence, the closer it comes to perfection, the more difficult it becomes to make a little more improvement. The mill can remove a little of its polluting substances with small costs. Strainers and filters may do the job. But the greater the percent of these pollutants that must be removed, the greater the increase in costs, so that to remove the final one percent might well cost more than what it took to remove the other 99 percent.[2] The mill finds great value in being relieved of such high standards of purity and being allowed to put these few units of waste into the air. After that, however, other units of waste could be removed or their production forgone for less cost, so their disposal via the air is less valuable to the mill; and so on with progressively less savings realized with progressively more wastes discharged.

The lesson is that the mill should not be allowed to put into the air or water all the wastes that it would like, but it should be allowed to use the air and water to carry away those units of waste that it would be most costly to treat. Similarly, Mrs. Murphy may not be allowed to have the country-fresh air and mountain-pure water that she would like, but she should be able to have air and water whose quality is most valuable to her health and well-being. She may have to settle for fewer views of the mountains, but so are users of steel settling for fewer cars and refrigerators because of increases in the costs of production.

2. FAILURE TO EXERCISE OWNERLIKE CONTROL OVER AN ASSET

Problems of environmental quality have commonly been considered to have arisen from some citizens, usually businesses,[3] despoiling nature's bounty so that consumers are harmed. A clearer picture, however, can be gained from viewing the problem as stemming from the misuse of an asset, in the instant case, water quality.

This water quality, just like water quantity, exists in streams, rivers, and lakes throughout the United States, and different people would like to make different uses of it. But to the extent that a factory or municipality located upstream uses the quality to absorb wastes that it puts into the river, those who live downstream and wish to enjoy water of high quality so they can swim, picnic, fish, process

[2] The Pennsylvania Power Company had such a case, but at one percentage point earlier and with twice the increase in cost just mentioned. In 1968 it installed a facility at its Newcastle, Pennsylvania, plant to remove 98 percent of the soot and ash created, because the state required that level of removal. The pollution abatement facility cost $2 million. The following year the state raised its standards to 99 percent removal. This level of waste treatment will require a $4 million facility, and because the earlier one cannot be adapted, the entire sum must be spent. For an additional $4 million an additional 1 percent of the soot and ash from one plant will be removed [28, *Wall Street Journal*, 1970, p. 1].

[3] "In a nationwide opinion study just released by the Marketing Department of *Reader's Digest*, 72% of the respondents laid a 'great deal' of the blame for environmental pollution on the doorstep of private industry. Only 12% of them gave business good marks. And not a single industry was well-rated by the general public" [27, *Wall Street Journal*, 1970, p. 3].

products, or drink, will be deprived of some or all of these uses. The case is no different from the private goods described above. If shoes or tables are being sold and one party buys them, another party cannot have them; he has been outbid.

Some people fail to see this similarity and argue that if Jones buys shoes, Smith is not hurt by this; but if Jones puts waste into a stream and Smith lives downstream, Smith *is* hurt. However, the two cases are far more similar, as the reader may now see. With a limited number of shoes, Smith is hurt when Jones gets shoes, because Smith cannot have those shoes. And with limited water quality, if Jones gets to use the water as he wishes, Smith may not. The case may be somewhat clearer if cast in terms of another natural resource, also God-given and limited in amount: land. Smith and Jones may both want a given tract of land, but when the smoke from the bidding clears away, the possible solutions are (a) Jones got the land and Smith got nothing, (b) Smith got the land and Jones got nothing, or (c) both Smith and Jones got parts of the tract, but neither got all that he wanted.

In the case of both shoes and land, the market provides a solution to the problem that society faces: who will get the limited amounts of shoes and land. Producers of shoes and owners of land will sell them to those persons who offer the highest prices for additional units, which, subject to limitations that can normally be met by other measures, puts them in the hands of those who value them highest, relative to other goods, and permits society to maximize total welfare.

Although there is, it is true, a public good problem associated with water quality, that is not the primary water quality problem that the nation faces today. Water quality is a public good in that if Tinker, Evers, and Chance live side by side along a certain river, the quality of water that any one of them enjoys will also be the quality that the other two receive. All too frequently the discussion of pollution problems has been cast in terms of a public good and how to charge or to reflect properly the wishes of the different users. But in actuality, the public good aspect is only a part of the problem, and not even the most important part. Who will be allowed to use the stream at the expense of others is a normal allocational problem and the one with which current legislation and subsidies are most concerned. Recall, for example, that both the production and consumption of food are almost entirely private good matters, yet the government devotes considerable time, effort, and money to altering the production and consumption patterns that the market would produce. So too with water quality. The discussion of public goods aspects hides the real issue.

The problems relating to the allocation of water quality among the various claimants would normally be solved by the owner of the asset devising some system whereby particular needs, presumably the most important ones, would be met. Although ownership of and control over water resources is not so straightforward as it might be, nevertheless, as the Senate Select Committee on National Water Resources observed, the Federal government has assumed this responsibility:

Federal responsibilities in the field of water resources stem directly from the Constitution. The power of Congress to exercise its responsibilities in this field has been upheld, beginning as early as 1824, by a long series of court decisions first under the commerce clause, later under the property, defense, and general welfare clauses of the Constitution. Also, under his treaty-making power, the

President, with the advice and consent of the Senate, is able to take action with respect to the waters of international streams. Other Federal responsibilities in the water resources field are placed by the Constitution in the Supreme Court, which has jurisdiction over disputes between two or more States over water, among other things, and in the Congress, which must consent to any agreement or compact between two or more States. Such compacts are frequently required to divide the waters of interstate streams, and for other purposes in connection with water resources [25, 1961, p. 21].

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At one time our inland navigation problems were preeminent, at another time the need was for settlement of public lands. More recently flood control has occupied the spotlight. In the near future the increasing trend toward urbanization may bring about needs for Federal participation in ways that cannot be foreseen at this time [25, 1961, p. 27].

From an economic standpoint, there has been a market failure in that the government as the owner of this resource, water quality, has not sought to put the resource to its highest marginal uses. When the distortion has become so large as to be a case of obvious inefficiency, the government has stepped in and taken action, usually by decreeing a different allocation, often involving a subsidy and sometimes in an unexpected direction and form, as will be described in the next section. Prior to the 1960's state governments had a primary responsibility in preventing and controlling water pollution, but early in that decade control began to gravitate to the Federal government [13, Stepp, 1968, pp. 34–37].

Besides the considerations associated with economic efficiency, there have also been ownership problems associated with changes that have occurred. In a private market, these are called pecuniary externalities and are reluctantly endured, but accepted, by those affected. When the demand for labor increases because a new firm moves into town, existing firms will have to pay more for their labor, and indeed, some may be forced out of business. But that result occurs because surviving firms can make better use of the labor than can those that expire. However, when new users of water quality arrive on the scene, older users may not lie down and die so gracefully. Having paid nothing and received something in the past, they may be unconvinced that this condition should not continue to exist into at least the future and perhaps into infinity, and if this benefit does not continue to obtain, some compensation should be paid. In particular instances, it has evidently been difficult to reject the argument, since compensation has been given.

3. ASSUMPTIONS RELATING TO PROPERTY RIGHTS

The failure of the governmental units, state and Federal, to exercise an ownerlike control over the water resources under their control has led to obvious waste that has in turn led to public pressure to take remedial action. In effect, three broad groupings of citizens have expressed dissatisfaction with either the current state of affairs or the proposed changes and have demanded compensation or subsidies. Each group is thus saying that it has a property right in the water resources and that it wishes either to enjoy this property or to be compensated for foregoing its enjoyment. The Congress has listened to all three groups and has responded to their arguments in different ways and to different degrees.

a. Citizens who wish to use water for its contribution to recreation, aesthetics, and preservation of wildlife have presented a case that these are the "highest and best" uses to which streams may be put and that such a use is the right of all of the people. Underlying this position is the implication that cleanliness is necessary for man to have the quality of water necessary for his personal intake. But since practically all water taken from rivers or lakes for human consumption is already treated and will continue to be treated in the future, the higher levels of cleanliness can be considered primarily for the benefit of those persons who plan to enjoy the contribution water quality makes to the aforementiond recreation, aesthetics, and wildlife propagation. Eric F. Johnson, Executive Director of the American Water Works Association, argues that this point is little understood.

[The biggest media-propagated misconception of all is that water pollution control will improve the quality of our drinking water. . . . Nothing could be farther from the truth. Pollution control may benefit fish, but it does almost nothing to improve water for people. Water for people is a manufactured product. It can be purified to any quality desired, regardless of source. But it's a totally separate operation from pollution control. If we want to improve water for people, we should start spending money for that purpose [4, *Clean Air and Water News*, 1971, p. 178]

There is however, a more important effect of water quality on human welfare, and this stems from the presence of toxic substances in water. However, this is a narrower problem than general water pollution. The President's Council on Environmental Quality notes that (1) little is known about the process whereby or the degree to which these substances affect man and (2) even if they are found to be not only a potential hazard but also a present danger, the problem may be met best by rules affecting their production and use rather than by rules affecting the medium, e.g., water or air, whereby they might be transported [17, 1971].

Providing higher water quality for the benefit of those who wish to use water for its contribution to recreation, aesthetics, and wildlife propagation can be classified as a regulatory subsidy. Other users, primarily business firms and municipalities, are required to provide a higher quality of water at their own expense so that those who want cleaner water may benefit. However, the propriety of classifying as a subsidy the provision of this form of water quality may be considered further under two different conditions.

It has been stated above that water quality is just like any other limited natural asset and that there is some optimal allocation of its use among the competing claimants. This means that at some economic optimum, firms upstream may benefit by being permitted to discharge limited amounts of waste into given waterways, and residents downstream will gain by being permitted to receive a level of water quality that is higher than they would otherwise enjoy because upstream mills and municipalities have been required to meet certain standards of waste-discharge. In a normal market, all who use a good that is beneficial and whose production imposes a cost on others must pay for it. If similar principles were applied to water quality, mills and municipalities would pay charges at a prescribed rate for the wastes they put in a stream. Similarly, residents downstream would pay for the asset, water of an improved quality, that they enjoy.[4] Alterna-

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[4] For a development of the case for charges on persons downstream as well as upstream, see Macaulay [9, 1970; 10, 1972].

tively, each party might be regulated and told how much he could discharge if he is located upstream, and what water quality he could enjoy if he is located downstream, all without payment. If such standards are designed to attain an economic optimum, each party realizes a gain in having been given the use of a scarce asset at no charge, just as television channels, oil import quotas, and acreage quotas constitute valuable rights and confer a gain on the recipient even though they are distributed without charge. In the case of water quality, if an economic optimum has been determined and reached, it may be argued that this is merely a case of providing a government service to particular users of water and no regulatory subsidy is involved.

However, the possibility of a subsidy element, even at this economic level, may be seen better if the situation is recast in terms of land allocation instead of water allocation. Assume that the government owned a tract of land which some farmers wished to use to graze cattle and another group of citizens interested in picnics, swimming, and related activities wished to use as a recreation site. Assume further that the government knew what allocation of land between the two users would provide the greatest good from the land and then it allocated the land between the two parties, free of charge. The farmers would enjoy an advantage over other farmers who must pay grazing fees, and recreationists would enjoy an advantage over others who seek recreation at privately owned or less convenient locations. If one party is able to make better use of additional acres than is the other party, then more land should be allocated to him to maintain the economic optimum. The additional land will be given to him by means of a regulation that requires the other party to receive less and so to incur a sacrifice or cost. The subsidy element is not readily apparent, but even the equilibrium case appears to fit the definition of a regulatory subsidy.

An extreme example showing the value of an asset distributed by regulation might be that of a television channel. Ronald Coase estimated that in 1966 the annual rate of return on investment for some stations when one had been allocated a channel in one of the first fifty TV markets was on the order of 200 to 300 percent per year, after taxes [7, 1966, p. 441].

However, when the regulations are set at some division of water quality that does not reflect an economic optimum, then clearly one group of users is being required to take action that will benefit another group of users. Either those who love recreational uses of water are being denied marginal uses that have great value just so firms and cities can discharge their wastes into streams and save relatively small amounts on treatment costs; or these firms and cities are being required to incur high costs of treatment of their wastes to provide recreation users with additional levels of water quality that add little to their enjoyment. Here there is not only economic inefficiency, but it is being provided for the benefit of one group at the expense of another group.

In the past factories and cities have been permitted by regulation to use the valuable waste disposal capabilities of streams and rivers at the expense of people who lived downstream and who would like to have made other uses of the stream. With provisions like those contained in the Federal Water Pollution Control Act Amendments of

1972 calling for zero waste discharge by 1985, the tables are being turned and downstream residents will be given a regulatory subsidy at the expense of those who previously enjoyed a similar benefit.
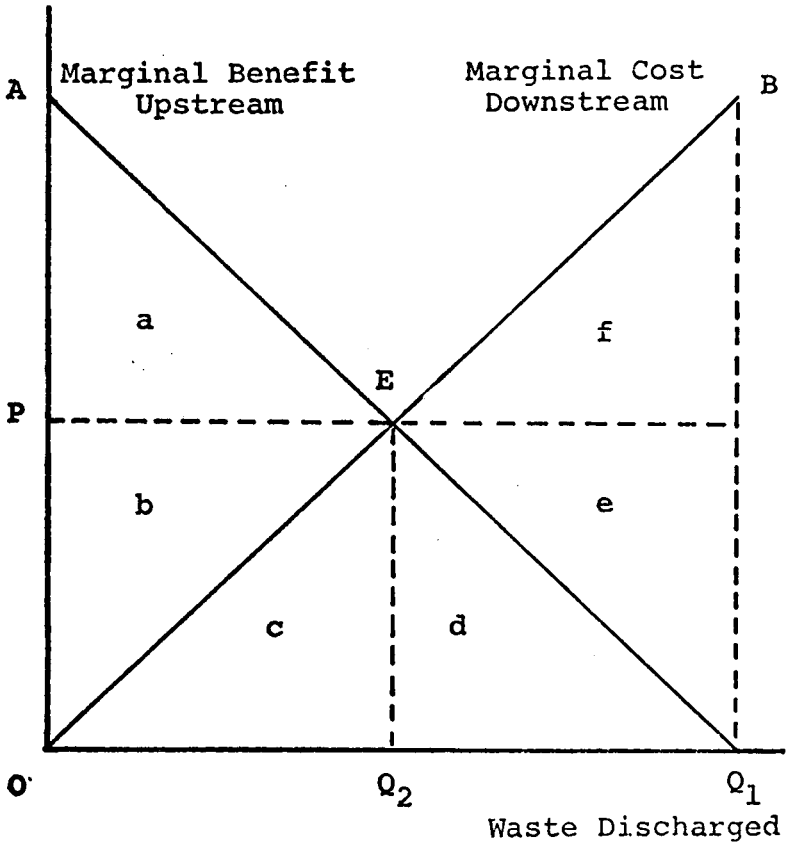
Figure I

**Economic Effects of Pollution
and Pollution Abatement**

Perhaps the comparisons may be clearer if expressed in graphical form. The Marginal Cost Downstream curve in Figure 1 shows that as more units of waste are discharged into a stream, the additional cost that downstream residents suffer from each unit rises. The Marginal Benefit Upstream curve shows that each unit of waste put into the stream saves money for, or benefits, the upstream firm which does not now have to treat that waste, but that each unit provides less saving than the previous one.

When there was no limit on the amount of waste that mills could discharge, they put OQ_1 in the stream. They saved an amount abcd but at a cost to residents downstream of cdef. The two amounts might be equal, but the solution was still inefficient. For the Q_2Q_1 units that the mill discharged, it saved d, but downstream residents suffered def, clearly a high price to pay for the benefit. In such a case, the government was providing a regulatory subsidy to mills and factories and at a high price relative to the benefits realized.

Much of the talk and the proposed legislation throughout the 1960's have been oriented toward solving this problem, but it will be argued below that the laws have created a new problem that is probably equally costly or even more costly, but opposite in its effect on the parties involved. Proposals to require zero waste discharge levels will move the level to O in Figure I. Here, downstream residents will forego the costs of waste discharged, i.e., will benefit from waste withheld, to the extent of cdef. Upstream firms will suffer costs, i.e., forego benefits, of abcd. The important comparison is confined again to actions beyond the equilibrium point. As Q_2O units of waste are withheld, upstream firms will pay abc to treat these units, and downstream residents will benefit to the extent of c. Once more, a regulatory subsidy of high cost is being provided to one group of citizens at the expense of another group.

If the government should by regulation declare that Q_2Q_1 units of waste must be withheld by mills, but that OQ_2 may be discharged, it has reached an economic optimum. However, both upstream and downstream parties are being given something of value for which they would be willing to pay. Upstream mills are saving treatment costs of abc for which they might be asked to pay a sum equal to (1) the damage this waste is causing downstream residents, c; or (2) a price of OP, which is equal to the damage of the marginal unit, times the amount of waste discharge, or a total charge of bc; or (3) an amount just less than the saving they would effect by using the stream for waste discharge, which is abc. The plight of downstream residents is symmetrical. They are benefitting from waste removal by an amount def which comes at a cleanup expense of d to upstream firms. The people downstream might be asked to pay (1) a sum equal to this cost, d; or (2) a sum equal to the marginal cost of waste treatment times the number of units treated, de; or (3) a sum just less than their total gain, def.

If the goal were to be to move to E by regulation and if that were the condition attained, there might be little concern over the subsidy aspects of the policy. Upstream firms would benefit at the expense of downstream residents and downstream residents would benefit at the expense of upstream firms. Considering the public good aspects of the downstream use of water quality and the difficulty in evaluating a good that has not previously had a market price, it might be acceptable to rely solely on regulations. However, if the goal is not to regulate waste discharge at Q_2 but at O, the subsidy aspects become more important.

b. Because industrial firms have been required to treat their own wastes so that persons who live downstream may benefit from cleaner water, the firms have argued that the residents should bear, or at least share, these new costs of producing clean water. In effect, the contention of the firms is that they have used streams in the past and have

acquired an implicit property right in this use. For the deprivation of this right to use the property, and, indeed, for the requirement that they provide downstream residents with a new product, water of high quality, they should be compensated. A subsidy should be given for their production of a product others will enjoy but for which they will not pay.

c. Municipalities have found themselves in the same situation as the mills. In effect they have been asked to finance the production of high quality water that will be enjoyed by other persons. They believe they should be compensated, or subsidized as they produce this good.

An alternative way of looking at the problem is the same one taken by the mills. By prior use of the stream for municipal waste disposal, the cities had established a right to such use. When they are deprived of it, they should be compensated. Both views, the compensation for production of water quality and the compensation for loss of the right of waste discharge, lead to the same proposals for action. The former, however, is more appropriate to the concept of subsidies and has doubtless influenced the use of that term as it applied to the treatment of wastes by mills.

C. Publicly Stated Reasons for Subsidies

With three different groups affected in different ways as they seek to receive higher levels of water quality or are required to produce higher levels, it is impossible that all three can base their claims on a right to enjoy the use of streams and rivers as they would like. Rather, different reasons must be put forward.

Those who have been given water quality that more nearly approaches its natural state have been told that this is only normal and that everyone has a right to clean water. It could as easily be said that everyone has a right to land in its natural state, but that statement would be more obviously incorrect. When President Johnson signed into law the Water Quality Act of 1965, he noted, "No one has a right to use America's rivers and America's waterways that belong to all people as a sewer. The banks of a river may belong to one man or even one industry or one State, but the waters which flow between those banks should belong to all the people" [24, *Public Papers*, 1965, pp. 1034–1035]. While the phraseology leaves something to be desired, and the statement may be used to support several different policies, the general interpretation has been that the people deserve clean water. Indeed, the titles given the Clean Waters Restoration Act of 1966 and the Clean Air Acts of 1963 and 1965 attest to this goal.

Supporting evidence of adherence to this right comes from the passage by the Senate on November 2, 1971, by a vote of 86–0 on S 2770 which provided for the complete elimination of the discharge of pollutants into navigable waters by 1985 and was later enacted as the Federal Water Pollution Control Act Amendments of 1972. Less direct but with the same implied right would be the provisions of HR 15578, introduced on January 1, 1970, which would make it possible for any person to bring suit against any other person or firm engaged in interstate commerce who was responsible for any pollution of air or water or creation of noise that adversely affected any person in any way.

If people have a right to clean water, the Congress will have to produce the product itself, subsidize other producers so they will produce it, or require others to produce the product and provide it at less than cost. To the extent that the latter course is followed it may be argued that a regulatory subsidy exists.

In recognition of the burden placed on mills and factories, arguments have been advanced that they should be subsidized for their production of water quality. Senator Cooper of Kentucky noted in 1967 that "it is only proper where companies purchase expensive equipment and facilities to reduce pollution—which facilities bring no financial return on their investment but are devoted to the greater public purpose and benefit—that some tax incentives should be provided" [16, *Congressional Record*, 1967, p. 1988]. The Committee on Ways and Means, when considering a measure granting accelerated depreciation for pollution abatement equipment, commented, "In effect, private industry is being asked to make an investment which in part is for the benefit of the general public." Two paragraphs later, they conclude that "your committee believes it is appropriate to provide an incentive to private industry for antipollution efforts" [22, 1969, pp. 15–16].

Governor Faubus put the matter most clearly in his comments when the Governors of the States were asked for their views on tax incentives and effluent charges for pollution abatement. After supporting tax relief for those firms that would be driven out of business by higher costs of waste treatment, he reflected on an extension of the treatment to all firms:

It is somewhat difficult to extend this conclusion to all industrial operations in view of the conflict between the two opposing philosophies that (1) waste treatment is a legitimate part of manufacturing operation and should be treated as all other parts; or (2) waste treatment is a nonproductive part of an industrial operation and should be exempt from taxation or allowed an accelerated depreciation on the necessary capital expenditures for treatment [23, U.S., House, 1966, pp. 37–38].

Popular pronouncements have centered on (2); Congressional action has usually indicated a stronger belief in (1).

Whatever case could be made for subsidies to firms could also be made for subsidies to municipalities that are now required to provide water of higher quality to those who dwell downstream. However, the arguments that have been advanced on behalf of the municipalities have not centered on their performing a service but on their inability to finance the treatment works that are now required. This inability is more assumed than documented, and this is understandable for documentation would have to assume how desirable the new expenditure is relative to other expenditures that are made by municipalities. Further, desirability is difficult to assess since in the past it has been permissible for many cities to discharge most or all municipal wastes into streams with only partial treatment or no treatment. Faced with new expenditures, cities may well buttress their case for aid in meeting them by arguing that they cannot assume this new burden. And they have, with considerable success. Almost all of the direct payments to improve water quality by constructing treatment facilities have been made to municipalities.

II. A Description of Water Pollution Abatement Subsidies

A. To Downstream Residents

The case of what might be considered a subsidy to downstream residents has already been considered. To the extent that upstream firms and municipalities are required to treat their own wastes, other individuals, mills, and municipalities below them will benefit, but benefits appear to be primarily for improved recreation, aesthetics, and wildlife preservation. A study of the Delaware River Estuary notes that if the quality of water in that river were improved, most of the benefits to municipal treatment plants would be realized by one particular plant but that "it is probable, however, that monetary benefits in terms of dollar savings and treatment costs at this point will be relatively small . . . ." As for industrial users of water, "in general, the industrial community indicates a low degree of sensitivity to water quality except for chlorides and dissolved oxygen." It is further noted that high levels of dissolved oxygen which are desirable for recreation uses of water, create greater corrosion and greater costs for industry [20, U.S., Federal Water Pollution Control Administration, 1966, pp. 8–9].

What remains are the benefits from recreation uses. The Senate Committee on Public Works has stressed the importance of these uses:

The Committee believes the restoration of the natural chemical, physical, and biological integrity of the Nation's waters is essential. To achieve this objective, the Committee recommends that the following be adopted as national policy:

*   *   *   *   *   *   *

—An interim goal of water quality be achieved by 1981 to provide for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water [26, 1971, p. 7].

Thus, a regulatory subsidy is provided primarily for persons enjoying these uses.

Because awareness of the problems associated with pollution is a relatively recent phenomenon [5] and actions to reduce pollution are even more recent, and because many of the uses of water quality have never been subjected to a market evaluation, studies that include both costs and benefits have been limited. One study of the Delaware Estuary does, however, present the issues rather clearly. The figures in Tables I and II are taken from this study. Quality levels range from I, with relatively high levels of dissolved oxygen of 4.5 to 6.0 milligrams per liter, to IV, with only 2.5 mg/1.

TABLE I.—ESTIMATED COSTS AND BENEFITS, 1975–80, FROM DIFFERENT WATER QUALITY LEVELS IN THE DELAWARE ESTUARY

[In millions of dollars]

Quality level	Estimated Cost	Estimated benefit
I	490	160–350
II	230–330	140–320
III	130–180	130–310
IV	100–180	120–280

Source: "Delaware Estuary Comprehensive Study."

[5] Recall that the basic law under which pollution abatement has been undertaken was the Water Pollution Control Act of 1948, and the first grants for community sewage treatment facilities under this act were authorized in 1956.

The wide range shown by the figures in each category reflects the uncertainty attached to the results. However, the figures seem to indicate that a strong case could be made for moving up through Quality Level III, and probably on into Quality Level II. Recall, however, that the relevant considerations for economic questions concern the marginal cost and gain, or how much extra cost and additional improvement are realized from any change.

TABLE II.—ESTIMATED ADDED COSTS AND BENEFITS, 1975–80, FROM DIFFERENT WATER QUALITY LEVELS IN THE DELAWARE ESTUARY

[In millions of dollars]

Quality level	Estimated added cost	Estimated added benefits
I	160–260	20–30
II	100–150	10
III	30	10–30
IV	70–120	120–280

Source: Calculated from figures in Table I and from information in the study.

The desirability of requiring Quality Level II is now vastly altered. Indeed, there is only a slight chance that Quality Level III could be considered economically sound. Quality Level IV appears the most efficient level, but if Quality Level II were selected, as apparently it was [1, Baxter, 1968, pp. 42–43], the sums of the marginal costs from IV to II will show the result. Mills and municipalities by regulation were being required to spend an additional $130–$180 million to provide people who use the Delaware Estuary with benefits that are largely recreational and which are estimated to be worth an additional $20–$40 million over the prescribed five-year period.

Figures showing the damages from increased water pollution may also be expressed in a reverse manner to show the benefits from decreased water pollution or improved water quality. The Council on Environmental Quality recognizes the difficulty in determining the value of these benefits, but evidently considers them substantial since it estimates that recreation losses due to water pollution may run into "many billions of dollars nationwide" [18, 1971, p. 108]. However, the three figures they cite to support this estimate do not inspire confidence in the final figure. The cases involve a $2 million loss if a Calfornia reservoir became polluted, a $16 million loss from salinity in the lower Colorado River Basin, and a $350 million loss in the Delaware Estuary. The last figure is the only one of significance. There would have to be 500 similar reservoirs to produce a $1 billion annual loss, or 60 river basins to reach the same figure. But if these losses are calculated in the same manner as the $350 million loss cited, they vastly overstate the loss that would obtain if an economically efficient level of water quality were realized.

A quick reference to Table I and Table II will show that the level of water purity required to reach their figure is not economically desirable and greatly overstates the added benefits that would be realized if a modest program of pollution abatement were already underway. Further, the loss is not an annual loss but what would be realized over a five year period. The other two losses cited are annual losses.

In addition, public expenditures for recreation cast grave doubt on how much people would spend for added water quality. Total expenditures for admission to motion pictures, legitimate theaters, operas, entertainments of nonprofit institutions, and spectator sports amounted to only $2.3 billion in 1969 [15, U.S., Bureau of Census, 1971, pp. 200, 194–195]. It is difficult to imagine people paying more for water based recreation than they pay for all of these forms of entertainment. The more precise question is, how much more money would people pay for higher qualities of water than they now receive? "Many billions of dollars nationwide" just for recreation appears to be a gross overestimate as an annual figure.

B. To Industrial Firms

As industrial firms have had to clean up their effluent, they have asked for financial assistance in providing this improved water quality to residents downstream. The Congress has not responded with large outright subsidies, but it has provided a few forms of financial assistance. Federal laws since 1956 have provided matching funds to municipalities to enable them to build or expand their treatment facilities and have also permitted firms to put some or all of their wastes through these municipal facilities. The Federal government might thereby help finance a treatment plant in which the firm's wastes would be treated. Since the amount of industrial wastes treated in these facilities and the terms under which municipalities charged for this treatment have varied widely, there is little indication as to how much firms may have benefited from this provision.[6]

A second form of assistance arose with the suspension of the investment tax credit in 1966. Under the new law, PL 89–800, investments in pollution abatement facilities were exempted from the suspension and so continued to enjoy the seven percent investment tax credit. Estimates given at the time the bill was under consideration indicated that the provision would result in a tax loss of less than $40 million annually [16, U.S., Congressional Record, 1966, p. 24704].

The most recent help for industry came in the Tax Reform Act of 1969, Public Law 91–172, which suspended the investment tax credit, this time without exception, but permitted the amortization over a five year period of that part of the cost of pollution abatement facilities that would normally be depreciable over the first 15 years of its life. The provision applies only to facilities that are used in connection with a plant in operation before 1969 and placed in service before 1975.

While it is too early to have gathered figures on the cost of this provision, the estimates made at the time the bill was being considered indicated an annual revenue loss of $15 million in 1970, $70 million in 1972, and $120 million in 1979 [5, Congressional Quarterly Almanac, 1966, p. 595].

[6] S 2770, which subsequently became Public Law 92–500, the Federal Water Pollution Control Act Amendments of 1972, however, provided that "an applicant for any grant must receive from each industrial user a commitment that the user will repay to the Federal Government that portion of the Federal grant allocable to the user's wastes. Each grant applicant must adopt, by July 1, 1973, user charges to assure that each category of recipients of waste treatment services will pay its share of the cost of operating and maintaining the treatment services provided" [26, U.S. Senate, 1971, pp. 26–27].

C. To Municipalities

With the exception of a few small grants made directly to industry under very limited programs, such as those made to particular firms as a demonstration grant whereby the firm would build and operate a treatment facility to test its effectiveness and efficiency, almost all direct payments by the Federal government have been made to municipalities. These payments, which have been made since the enactment of the Water Pollution Control Amendments Act of 1956, have been used to match expenditures made by state and local governments for the construction of waste treatment plants. The Congress evidently hoped that these additional contributions from the Federal government would encourage local governments to undertake or expand projects they might otherwise have rejected or delayed. Over the thirteen years, 1957–1969 inclusive, Federal grant appropriations of $1,276 million have been made to support projects whose total value was $6,824 million [19, U.S., EPA, 1971, p. 19].

At times, however, the program has had an unexpected effect in delaying new municipal projects. Because of the large volume of requests for support relative to the sums appropriated, it was impossible to approve all requests. Many municipalities believed it was better to delay construction until their requests could be approved and support secured rather than to go ahead and construct the project without support. Thus, projects that would otherwise have been undertaken have been delayed because of a prospective subsidy [3, *Business Week*, 1969; 18, U.S., Council, 1971, p. 142].

III. EFFECTS OF SUBSIDIES PROVIDED

A. Effects of Regulatory Subsidies

The regulations requiring industry and municipalities to meet higher levels of quality in the effluent they discharge have not been viewed as subsidies by the general public, and apparently not by the Congress. The general view is that water purity is desirable, and recent and proposed legislation promotes its production as a right of the people.

If that condition should be realized, industries and municipalities will be forced to incur large expenses. The Council on Environmental Quality estimates the annualized costs for water pollution abatement by these organizations to be at least $3.1 billion for 1970 and $5.8 billion in 1975. The true figures should be significantly higher since the calculations do not include expenditures for collecting and combined sewers [18, 1971, p. 111]. Given the case of the Delaware Estuary cited above, a river where pollution control should provide greater-than-average benefits, it is unlikely that there will be significant added benefits realized from most of these expenditures.

If the costs of improved waste treatment by businesses are included in their costs of production and passed on to consumers of their products in the form of higher prices, as seems almost inevitable, these charges will have an effect similar to a sales tax. Increased sewer charges by municipalities, which is the normal method of financing such projects, should fall on city residents and should be slightly greater for persons with higher incomes, but on balance produce a

charge that is regressive when compared to income. Henry Wallich has predicted that the net effect of this regulatory subsidy will be to redistribute income from the poorer citizens to the wealthier ones [29, 1971]. This arises because the sales tax effect from the cost of cleaning up will fall most heavily on the relatively less wealthy persons, while the benefits of cleaner streams will accrue to those who can afford trips to recreational sites and can afford to press for a reduction in the number of fish and other wildlife that are sometimes killed from pollution, and these persons are generally the wealthier citizens. E. J. Mishan argues conversely but bases his position on the case of poorer persons who are affected by pollution but may not be able to move to avoid the pollution [11, 1971, p. 24]. It would appear that Wallich is correct with regard to water, and that Mishan is correct as to the benefits from air pollution abatement but not necessarily correct when the generally regressive costs are also included. The question is a complex one and no definitive work seems to have been done in the area.

B. Effects of Subsidies to Industry

The subsidies to industry, other than the regulatory subsidies that at one time were given to industry but are probably quite limited today, have been in the form of a special investment tax credit, joint waste treatment with municipalities when the Federal government has provided funds to help finance the treatment plant, and accelerated depreciation for waste abatement equipment. Whether these provisions have been a subsidy to industry or merely a partial payment for the production of a product (cleaner water) which society wants, depends on the answer to the question raised by Governor Faubus and cited earlier. It has been argued above that as waste discharges are reduced from OQ_1 to OQ_2 in Figure I, upstream firms are deprived of the use of the stream for waste disposal because downstream residents get more benefit from stream quality. Industry has been outbid for, or lost out in a proper allocation of, water quality. If industry has not owned the rights to stream quality or waste discharge, there is no reason to subsidize. It will be forced by regulations or price to move to OQ_2, and any payment to it is merely a transfer payment.

This is an important point that is often overlooked. Many arguments for subsidies to industry are promoted on the grounds that subsidies will promote waste treatment and provide higher levels of water quality. The conclusion is not sound. If waste treatment yields no tangible salable product or one with only limited value, as is often argued, then a subsidy that fails to meet the unrecovered costs of treatment will still not encourage a firm to treat its waste. The most that can be said for such subsidies is that they reduce the opposition to regulations requiring higher levels of water quality, but the regulations alone could effect these levels. The net effect of this amount of subsidy is a transfer payment from general taxpayers to firms that create water polluting wastes, granted to these firms for doing what they are required, and quite logically required, to do.

As waste discharge levels are reduced below OQ_2, the situation changes. Here, as has been discussed, firms are being required to provide at high unit costs, improved levels of water quality that have lower unit values. The transfer effect described in the preceding para-

graph still obtains, but this time with some semblance of justification. The case may once again be somewhat clearer if expressed in a hypothetical case involving land. Assume there were 1,000 acres available and by normal bidding 900 of these would have gone to individuals and 100 to businesses. However, if businesses were able to take a preemptory right to all the land they could use at no cost, they might take 250 acres. If the government, seeing the unfairness or inefficiency of that allocation, decreed that firms would be allowed 100 acres and individuals 900 acres, there would be no case for compensating firms for the loss that reallocation created. Such a division would be an optimum, and indeed both groups of users should be required to pay for their use of the scarce asset. But if new rules reduced business uses to 10 acres and increased individual uses to 990 acres, a case could be made for subsidizing the purchases by business of multistory buildings, even though single story buildings would have been far more economical.

One aim of charges and subsidies is to call attention to the cost of doing certain things or receiving certain goods so those who are affected will be more economical and efficient in their choices. Collecting taxes to provide the subsidy could result in a more reasonable demand for higher water quality on the part of taxpayers, but since such subsidies are only one expenditure out of general tax revenues, and a small part of the total at that, the subsidies have had a negligible effect in promoting a desire for an optimal level of water quality.

There is a tendency to infer that the transfer of funds from taxpayers to industry must operate to the disadvantage of the low to average income citizen because taxes come from all citizens, rich and poor, but in this case go to businessmen who are considered to be a wealthier group. Recall, however, from the preceding section that increased waste treatment probably has an effect like unto a sales tax. If that be so, a subsidy to offset some of the burden of waste treatment would operate like a reduction in sales taxes.

There is one other effect that is concerned primarily with economic efficiency rather than income distribution. The subsidies to industry have been in the form of more favorable tax treatment for the purchase of pollution abatement equipment. However, pollution may also be reduced by a greater use of supplies such as chemicals and filters, or increased use of power to reaerate the water, or changes in production processes that may reduce or eliminate the creation of certain waste products. If only the purchase of more plants and equipment receives tax favor, this method of waste treatment is encouraged even though it may not be the most efficient. This is particularly true for industry which must be able to produce different goods as consumer tastes and technology change and to treat different wastes that result from these changes. Because of this need for flexibility, businesses usually prefer to build a plant with a smaller ratio of fixed capital to operating costs than do municipalities. The municipal treatment plant is subject to less diversity in the makeup of its sewage and so can afford a capital intensive operation to handle its relatively uniform product.

In summary, subsidies to industry have been small, but a case can be made for their use. They probably result in a slight redistribution of income from rich to poor. The form in which they are given promotes inefficient methods of waste treatment.

C. Effects of Payments to Municipalities

Although there is some question as to whether the definition of subsidies that has been adopted for this compendium should include payments made by the Federal government to state and local governments for pollution abatement purposes, both the similarity of these payments to those made to industry and the potential size of such payments in the future argue for their inclusion and consideration. Federal payments to be excluded from the "subsidy" classification include those grants to State or local governments where the funds are used to provide governmental services to the State or local populace as a whole. Pollution abatement payments made to municipalities do benefit the populace as a whole, but they benefit the populace by providing a particular designated government service, and the payment increases as there is an increased output of a given good, water quality. Thus, a subsidy designation appears justified.

Just as in the case of industry, there are two general levels at which municipalities may be required to operate in treating their effluent. If, in Figure I, they are required to treat Q_2Q_1 of their wastes but are allowed to discharge OQ_2, they are receiving a benefit equal to abc, produced at a cost of c to downstream users. While a strong theoretical case can be made for collecting some charge for this use, there are practical arguments against such actions that may outweigh them: an economic optimum is already attained, both upstream and downstream users of water quality should be charged and conveying the logic of charges may be difficult, and the costs of measurement and collection might in some cases outrun the amounts collected.

If, on the other hand, complete purity is required in the quality of the effluent, the municipality must move toward O in Figure I, and here there is justification for a subsidy on grounds of economic efficiency. From the standpoint of economic allocation, large expenditures must be made relative to the value of benefits provided from the additional waste treatment. From the standpoint of income distribution, the effect is the same as in industry; uneconomically high levels of water purity will probably effect a net transfer of income from the poor who live in municipalities to the wealthier persons, regardless of where they live, but with far less than a dollar of benefit for every dollar of cost.

Approximately 70 percent of the municipalities in the United States with a population of over 5,000 rely on sewer service charges of some type to finance their municipal treatment plant. However, only about one-third of these municipalities collect enough from these charges to meet operation, maintenance, and debt service costs of the plant [21, U.S., FWPCA, 1969, pp. 6, 8]. Hence, the balance must be financed through some form of municipal taxation. Under either of these forms of finance, the cost of municipal waste treatment will be regressive relative to income [21, U.S., FWPCA, 1969, pp. 59–60; 14, Tax Foundation, 1967, p. 20].

Although sewerage charges are regressive, this is not a sufficient argument to abandon or change the rates. If the charges accurately reflect the cost of providing for collection and treatment of sewage, a strong case can be made for their use. Charges for food and other essentials are also regressive in their effect.

However, problems of equity and efficiency arise when one group in the economy is forced to buy more of some good or service than it would buy under conditions leading to a social optimum, and to pay a price for this good or service far in excess of the benefit that others will reap from its production and purchase. This problem obtains with municipalities which are required to buy higher levels of waste treatment than are economically justifiable. The inefficiency will remain whether or not subsidies are given to municipalities. Equity, however, is affected by the subsidy. Without a payment by the Federal government, the burden for waste treatment will be regressive. The portion that is financed from local revenues may conform to Tax Foundation estimates that persons with less than $2000 income per year paid 15 percent of their income in state and local taxes in 1965, and the rate declined to 9 percent of income for those making over $15,000 a year. With a large subsidy, the burden will likely conform to that for general Federal revenues, which the Tax Foundation estimates rose from 13 percent for persons whose incomes were under $2000 in 1965 to 34 percent for persons whose incomes were over $15,000 [14, 1967, p. 20].

IV. SUMMARY AND CONCLUSIONS

A. Allocation Considerations

Most questions regarding subsidies for water pollution abatement have centered on the relatively favorable tax treatment given to business firms that improve their waste treatment facilities. While this can be considered a subsidy, it is only a small part of the real subsidy that is being given, and under closer examination may be seen as a subsidy to consumers of water quality rather than as a subsidy to business.

The important subsidy involved in water pollution abatement is the regulatory subsidy that requires firms and municipalities to attain higher and higher levels of water quality in the effluent they discharge so that consumers of water quality, primarily those who wish clean water for recreational and aesthetic purposes, can enjoy these uses. These uses do have value, but the important measure of that value is not its total contribution to human satisfaction but its additional contribution as higher levels of water purity are attained. Only limited measures of these benefits are available, but an analysis of these measures indicates that the added benefits are quite small relative to the increased costs that will be required to produce them. In addition, one should be careful to note whether the benefits cited represent the value of the improved water quality to the user (as measured by the price he would be willing to pay for it), or whether they represent the improvement in his welfare over his present pattern of consumption, a net figure that would be much less than the value of the asset. For example, assume there are two streams: stream A, which is convenient but dirty, and stream B which is more remote but clean. A fisherman may choose to fish in stream B and would be willing to pay $4 for this privilege. If stream A were made just as clean, he would pay $5 to fish there. What, then, is the benefit from cleaning stream A, $5 which represents what the fisherman would pay, or $1 which represents his net benefit from fishing in stream A? If it cost $3 to clean stream A, this could be an inefficient expenditure. It is not clear, from most of the figures given to reflect benefits, which of these concepts is employed. From an analysis of the way

benefits from improved water quality are computed and a comparison with other recreational expenditures, it is difficult to see how the added recreational benefits could be as much as one billion dollars a year.

Annualized costs for producing water purity are estimated by the Council on Environmental Quality to be more than $3.1 billion in 1970 and $5.8 billion in 1975. However, these figures do not include the annualized costs for the $15–$48 billion designated as needed to be spent for combined sewers between 1970 and 1975 [18, U.S., Council, 1971, p. 111]. It is probable that a sum at least equal to the Annualized costs given is the cost of the regulatory subsidy being given to consumers of particular forms of water quality. Indeed, these sums are conservative relative to Kneese's estimate that the waste assimilative capacities of just our surface waters could save us $10 to $12 billion a year in disposing of our household wastes [7, Kneese, 1966, p. 80]. Kneese does not make it clear whether this level of discharge would produce an economic optimum or a level of unbearable pollution, but all of his other writings deal with how to obtain the maximum advantage from all uses of our water resources. From all of these figures it would appear that present and prospective Congressional policy to reduce further the discharge of pollutants, and to strive for elimination of such discharge by 1985, is imposing an added annual cost on society of $3 billion or more and that this cost may well rise to more than $10 billion in the future.

B. Distribution Considerations

If firms and municipalities are required to attain higher levels of purity in their effluent, the costs will ultimately be borne largely by the customers of the firms and the residents of the municipalities. Such charges will tend to be regressive in both cases. By giving subsidies to firms and municipalities, the Federal government tends to substitute a source of finance that comes from progressive taxes for a source that depends on regressive charges. Not only may this accord with the more popular notions of income distribution but it may also come closer to putting charges on those who are most likely to benefit from higher levels of water quality. However, since benefits are not tied directly to taxes, there is not likely to be much pressure to economize on these expenditures.

For over a decade questions relating to water pollution have received serious and extensive discussion in the economic and engineering literature. Practically all writers have argued for a wise and beneficial use of our natural resources. They have concluded that this will entail some optimal level of purity, but that this level should be short of perfect purity or a zero level of waste discharge. Yet governmental policy seems to be moving inexorably toward this costly and inefficient level of perfection. Fortunately the Joint Economic Committee definition of subsidies allows an analysis of pollution abatement in its basic form. This analysis shows the present policy to be one whereby those with lower incomes pay a larger percentage of their incomes than those with higher incomes for water quality, so that those who prefer the recreational and aesthetic uses of water may enjoy these benefits, even though the cost of providing them is far greater than their value to the users. Society's resources could be spent more profitably in meeting other more pressing needs.

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SUBSIDIZATION THROUGH REGULATION: THE CASE OF COMMERCIAL TELEVISION BROADCASTING*

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INTRODUCTION

Regulatory agencies are often characterized as institutions that seek to prevent market abuses. They are said to prevent monopolists from charging prices greatly in excess of production costs and to maintain minimum standards of quality and safety in products about which consumers can not reasonably be expected to be expert enough to make their own evaluations. These activities of regulatory agencies are not in any meaningful sense subsidies. Although the effect of these activities may be to reduce the wealth of regulated firms, the financial consequences are not the object or the means of regulation. Instead, the purpose is to make private markets more efficient mechanisms for satisfying consumer wants.

But regulatory agencies do not confine themselves to the role of a perfecter of private markets. They also seek to encourage certain types of behavior by the regulated that would never result from a competitive market environment. Regulatory agencies insulate regulated firms from competition in some markets in return for requirements that regulated firms provide some services that are uneconomic— i.e., that can not generate enough revenues to cover costs.

The most obvious examples of indirect subsidization through regulation are public utility pricing policies. In transportation, for example, prices for shipping certain products between certain cities are set substantially above costs so that transportation firms can cover the losses incurred in shipping certain other commodities between certain other cities at prices set substantially below costs. Similar practices can be found in telecommunications and power regulation.

This paper deals with a slightly less obvious case of subsidization through regulation: the restrictions on competition in television broadcasting employed by the Federal Communications Commission (FCC) to promote local service and public affairs programming. Because the types of programs that the FCC tries to encourage are generally not profitable—especially if other conventional entertainment programs are also available—the FCC has restricted competition in the broadcasting industry. This has provided some broadcasters with extremely high profits, some of which can be used to finance uneconomic public

service programming, and has limited the number of options available to viewers, thereby forcing greater viewing of the type of programming the FCC tries to promote whenever stations do broadcast public service programs. The restrictions to competition that the FCC has employed are: (1) severe limitations on the amount of high-quality assignments in the electromagnetic spectrum to television broadcasters, (2) exclusive reliance on local, as opposed to regional or national, station assignments, and (3) significant constraints, if not outright prohibitions, on the use of new technologies (most notably cable television) that could make substantial additions to the number of viewing options available.

The U.S. Television Industry

American television is, in economic terms, an average-sized industry. The combined annual revenue of television stations and networks is approximately three billion dollars: about the same as such prosaic endeavors as the manufacture of paperboard boxes, cotton broadwoven fabrics, or canned fruits and vegetables. But television revenues grossly understate the importance of the industry, even for the economist, as they measure only television's advertising role. Most of TV's social value arises from its role as a medium of entertainment and information. Nearly 95 percent of American homes have television sets, each of which is viewed several hours daily. Such extensive viewing is bound to affect most Americans as consumers, voters, neighbors, and even parents. Because of this pervasiveness and social impact, the medium has generated persistent and voluminous criticism. The complaints, while diverse, divide themselves into four categories:

1. *The Robert Hutchins Complaint.* Television, it is said, is a potentially powerful medium for educating, informing, and elevating tastes. Its failure to exploit this potential has been succinctly expressed by Robert Hutchins: "We have triumphantly invented, perfected, and distributed throughout the land one of the greatest technical marvels in history, television, and have used it for what? To bring Coney Island into every home. It is as though moveable type had been devoted exclusively since Gutenberg's time to the publication of comic books." [1]

2. *The Spiro Agnew Complaint.* Television is dominated by a few organizations and individuals. In a medium of such importance, these few have a disproportionate influence over political opinions and cultural standards. Ironically, the anti-establishment forces have not been the most vocal about this problem. Rather it was Vice President Agnew who said, "Nowhere in our system are there fewer checks on vast power." [2]

3. *The Wasteland Complaint.* Television programming consists primarily of entertainment shows appealing to large audiences. It is not sufficiently diversified to serve such minorities as symphony lovers or motorcycle racing fans. As former FCC Chairman Newton Minow said:

There are many people in this great country, and you must serve all of us. You will get no argument from me if you say that given a choice between

[1] From an address delivered by Robert M. Hutchins, June 1, 1961, quoted in Gary A. Steiner, *The People Look at Television* (Alfred A. Knopf), p. 235.
[2] Speech, Des Moines, Iowa, November 13, 1969.

a western and a symphony most people will watch the western. I like westerns and private eyes too—but too steady a diet for the whole country is obviously not in the public interest.[3]

4. *The "Here Come the Brides" Complaint.* There is a limited choice even among the standard fare of commercial broadcasting. In the spring of 1970, a frequent complaint in letters to television editors of newspapers had to do with the replacement of "Here Come the Brides," a popular light comedy series, with a similar type program—presumably more popular.[4]

These four complaints arise in part from the scarcity of television channels. Scarcity limits the educational use of television (the Hutchins complaint), concentrates control (the Spiro Agnew complaint), leads to programming for mass audiences (the Wasteland complaint), and, even for mass audiences, limits program selection (the "Here Come the Brides" complaint). Of course, the four complaints are also directed at the way existing channels are utilized, but nonetheless the degree to which channels are a scarce resource influences their utilization.

Most programs are produced by profit-making firms and the quest for profits shapes television's performance. The money-making orientation of television is not atypical; the distinctive features are, first, the extent to which television profit-seeking is channeled and conditioned by regulatory policies, and, second, that television is one of the few private enterprise activities that gives away, rather than sells, its principal product.

Television Station Assignments

Most television programs are delivered by over-the-air broadcasting. No two television stations (or any other transmissions) can use the same frequency at the same time in the same geographic areas with present receiving equipment. Hence frequencies are assigned by the Federal Communications Commission. In 1946, the FCC set aside twelve very high frequency (VHF) channels for television. Eventually these accommodated 529 station assignments through careful control of geographical separation, antenna height, and transmitter power. About a fifth of the VHF assignments were reserved for noncommercial licensees, who must be nonprofit organizations and cannot sell advertising.

As early as 1949, the FCC recognized that the number of VHF stations was insufficient for adequate competition and for a reasonable range of choice for much of the population. After four years of hearings and deliberations, the Commission allocated 70 ultra high frequency (UHF) channels which provided 701 additional station assignments. About 40 percent of the UHF assignments were reserved for noncommercial use.[5]

As Table 1 indicates, 36.8 percent of the commercial assignments remain unclaimed, of which 85.5 percent are in the UHF band, while 67.2 percent of the noncommercial assignments (of which 90 percent are UHF) are unclaimed. UHF stations have several disadvantages

[3] Newton N. Minow, "The Vast Wasteland," speech (Washington, D.C., May 9, 1961), reprinted in Newton N. Minow. *Equal Time: The Private Broadcaster and the Public Interest* (Antheneum : 1964), p. 55.
[4] *TV Channels,* April 12, 1970.
[5] Federal Communications Commission, *Sixth Report and Order* (Dockets No. 8736 *et al.*, April 11, 1952). For a summary of the Report, see FCC, *Annual Report,* 1952, pp. 107–13.

compared to VHF; not all sets can receive UHF, the UHF tuning system is cumbersome on most sets, and the UHF frequency assignments are less suitable for television use, making the quality of UHF signals lower.

Networks, Independents, and Group Ownership

The most important programming sources are the three national networks. The networks provide local affiliates with programs that carry advertising which is sold by the networks. The networks pay an affiliate roughly a third of the network advertising revenues that are earned in that affiliate's market.

Most network programming is not produced by the networks, but instead is purchased by them from independent producing companies. Nearly all program production by networks is of news, sports, and day-time shows. The program production industry is a highly competitive one. Nearly a hundred firms have succeeded in selling a prime-time series to a network in the past few years, and no firm has had more than 20 percent of the market.[6]

TABLE 1.—STATUS OF TELEVISION CHANNEL ASSIGNMENTS, SEPT. 1, 1971

Classification	Commercial		Noncommercial	
	VHF	UHF	VHF	UHF
Channels allocated or reserved_____	593	662	123	523
Stations on the air_____	511	186	87	115
Authorized stations not on air_____	15	81	4	16
Available channels_____	67	395	42	392

Sources: Federal Communications Commission, Broadcast Bureau, Rules and Standards Commission (unpublished data on allocations), and Broadcasting, Sept. 27, 1971, p. 60.

The advantage of networks arises not in program production but in the scale economies of program distribution. The cost of producing a half-hour, prime-time program currently averages a little over $90,-000.[7] Only a large audience can yield advertising revenues sufficient to support such costs, and the nationwide networks provide such audiences. With only three networks, program decisions become highly centralized, thus vitiating the objective of local outlets responsive to local needs.

In addition to the networks and their affiliates, larger communities have one or more "independents"—stations that are not affiliated with a network. Independent programming consists largely of "syndications"—usually filmed or taped shows sold directly to local stations by program packagers. (Affiliates also on occasion buy syndications as an alternative to network programs, and independents occassionally broadcast network programs rejected by the affiliates.) Syndications represent an alternative to networking in achieving large multicommunity audiences to cover program costs. Many syndications are reruns of network shows or movies, but a growing number are produced especially for the independent market. Some live syndications are also offered. In the past these have been mostly sports events, but recently a few prime-time entertainment programs—most notably,

[6] See *Television Program Production, Procurement and Syndication,* Vols. I and II (1966) and Supplement (1969), Arthur D. Little, Inc.
[7] *Broadcasting,* April 5, 1971, pp. 32–33.

Lawrence Welk—have also been syndicated for live broadcast after being rejected by the networks.

To further complicate the industry structure, many stations—both affiliates and independents—have common ownership.[8] One successful chain—Metromedia—owns four independents and one affiliate in large markets and is active in producing common original programming for its own independents and for sale to independents in other markets. Group W—a Westinghouse subsidiary composed of four affiliates and one independent—also has a producing group. Perhaps because most of its own stations are affiliates, it makes less use of original programming than does Metromedia, but it produced the widely-broadcast David Frost show.

The remaining stations are noncommercial broadcasters. These stations are financed by private and government gifts, rather than advertising. In the past this group of broadcasters has relied upon their most successful stations—in Boston, Los Angeles, New York, and San Francisco—for most of their programming. Prior to 1968, the National Educational Television Network (NET) acted as a clearing house for tapes and films, many of which were produced by its own New York station. In 1968 NET was supplanted by the Corporation for Public Broadcasting, which began to develop a network of public broadcast stations modeled after the commercial systems. The Corporation provides financial support for program production and the Public Broadcasting Service, established by CPB in 1969, distributes these and other programs to public broadcasting stations.

The combination of networks, independent stations, and noncommercial television has resulted in more television programs in the United States than in any other country. Still, choice is more limited than it is for most consumer goods. Fewer than half the homes in America can receive more than five channels.[9]

The best hope for increasing the number of options is cable television. About 7.5 percent of television homes now subscribe to community antenna television (CATV).[10] Cable systems carry signals from a central station to homes via coaxial cable. They provide improved reception of local over-the-air television, but can also use either master antennas or microwave relays to bring signals from other cities into a community, thereby adding more channels.[11]

A survey by Gary Steiner indicates that the greatest unfilled demand is for just those types of programming which already dominate the program schedule. His data, shown in Table 3, compare program availability, the actual viewing pattern, and the distribution of preferences for more programs for a sample of New York City residents. The actual viewing pattern matches the options or menu provided except for regular news broadcasts and movies. Given that the menu must be limited, commercial broadcasting appears to do a good job in matching the composition of the menu with actual viewing habits. The

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[8] The FCC limitation on the number of stations that may be owned by any one organization is five. Each of the networks owns five stations all of which are located in highly profitable markets.

[9] Herman W. Land Associates, *Television and the Wired City* (National Association of Broadcasters), pp. 116, 119.

[10] *Broadcasting*, April 21, 1971, p. 60.

[11] A single cable can carry as many as 24 channels and several cables can be placed side-by-side and connected to the same receiving device. Some channels can be used by the CATV system to originate its own programs. Current home television sets can receive 12 CATV channels without any technical change and can receive 20 channels with an adapter costing $15 to $20. All 20 channels have better picture quality than over-the-air VHF. CATV systems make a monthly charge to their subscribers for the use of the cable.

problem is that so few options are on the menu. Most people want more options in each category, including the categories now well represented. In fact, the distribution of responses in the last column indicates those program types most available are the very ones for which there exists the strongest demand for more of the same.[12]

Concentration of Control and Profitability

Concern with concentration of economic power has always been a characteristic of American public policy. Some of this concern is based on the desire to achieve the presumed benefits of competition—prices and quantities responsive to demand and supply, adapting to technological and market opportunities, and prevention of monopoly profit. Yet some of the concern with concentration reflects an objective of decentralization of power *per se*. This particular objective ranks high for communications media because of their social and political importance.

TABLE 3.—PROGRAM AVAILABILITY, VIEWING PATTERN, AND DESIRED ADDITIONS TO THE MENU OF PROGRAMS, NEW YORK CITY, 1960[1]

[All figures are percentages of totals]

Type of program	Program availability [2]	Actual viewing pattern [3]	Percent of viewers desiring more programs in category [4]
	(1)	(2)	(3)
Action	16	22	14
Comedy/variety	20	19	22
Light drama	8	7	7
Light music	5	4	10
Sports	8	3	6
Regular news	5	29	1
Information and public affairs	9	5	17
Heavy drama	6	4	6
Religion	2	0	5
Movies	22	6	1
Heavy music	0	0	1
All other [5]			11
Total	100	100	100

Source: Gary A. Steiner, "The People Look at Television" (Alfred A. Knopf, 1963), pp. 146, 163, 166.

[1] Figures on availability viewing pattern (cols. 1 and 2) are derived from American Research Bureau samples between Sept. 20, 1959, and Mar. 7, 1960. Figures on desired changes in programing (col. 3) are derived from independent sampling in March and April 1960.
[2] Unduplicated minutes of programing devoted to category from 6 p.m. to sign-off, weekdays, and all day Saturday and Sunday as percentage of total number of minutes available.
[3] Number of programs in category watched by viewers from 6 p.m. to sign-off, weekdays, and all day Saturday and Sunday as percentage of total number of programs viewed.
[4] First mentioned request for additional programing in category as percentage of total requests.
[5] This category applies only to col. 3.

Concentration. Television is a highly concentrated activity. The three networks originate about 90 percent of evening prime-time programming and 60 percent of all programming for affiliated stations, which comprise 86 percent of all stations.[13] The program decisions of three networks are responsive to viewers' desires as reflected in

[12] It should be emphasized that this demand pattern emerges when all programs are shown at a zero price to the viewer. Whether and to what extent the imposition of positive (and variable) prices would change the pattern is open to question.
[13] FCC Annual Report, 1970, p. 159.

audience ratings. Still, the networks have the initiative in deciding what should be offered.

Concentration also manifests itself in station ownership. The networks each own the legal maximum number of five stations. Since these are in the largest cities, networks reach 25 to 30 percent of all TV homes with their own stations.[14] Other chains are also significant. In the top 25 television markets, with 50 percent of television homes, 70 percent of the stations are part of a multiple ownership system.[15]

A different form of concentration results from cross media ownership.[16] Some argue that the effects of the concentration of television ownership are offset by competition from other media. But the closest competition, at least with respect to news, is provided by newspapers, and 30 percent of the television stations are owned by daily newspapers. Joint ownership of radio and television stations is also extremely common, and is often accompanied by newspaper ownership.[17] The most extreme degree of media concentration exists in seventy-three communities in which one firm owns all the local broadcast and newspaper properties.[18]

Television profits. In 1969, television profits, before federal income tax, were about $554 million, representing a 20 percent return on sales.[19] By comparison all manufacturing corporations earned about 8 percent.[20] The profit rate on the book value of tangible broadcast property was 73 percent, more than three times that prevailing elsewhere in the economy.[21] While 1969 was a good year, 1970 was "lean" by industry standards. Profits fell to $454 million, "only" 16 percent of sales and, if tangible broadcast property were 10 percent higher than the previous year (a generous assumption), 55 percent of tangible investment.[22] Returns of this magnitude have persisted since the fifties.

One objective to high profits is that the revenues are greater than necessary to maintain the industry. Yet this objection is not very compelling. If television profits were down to, say, $175 million, yielding a rate of return on investment comparable to that in manufacturing, the cost of the present commercial television industry in 1970 would have been $2.5 instead of $2.8 billion.[23] A $300 million gain would be trivial for an economy with a gross national product of $1 trillion. Rather, the importance of high profits is an indicator that competition is less than that prevailing elsewhere in the economy and hence that too few resources are being allocated to the industry.

In using profit rates as indicators of resource misallocation, three additional points must be noted. First, networks and many stations incurred substantial losses in the early years of television, and if these losses are counted as part of initial investment, profit rates become

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[14] Hyman H. Goldin, "The Television Overlords," *Atlantic,* June 1969, p. 88.
[15] Lee Loevinger, "Broadcasting and the Journalistic Function," in Harry J. Skornia and Jack Kitson, *Problems and Controversies in Television and Radio* (Pacific Book Publishers, 1968), p. 324.
[16] Often mentioned as another policy problem is the ownership of television stations by conglomerates—enterprises with ownership interests in a wide range of industries as well as television. The alleged dangers are that station program policy will be shaped to promote or protect the interests of the other enterprises of the conglomerates. While its effects are more diffuse, such conglomerate ownership could be a problem.
[17] Loevinger, "Broadcasting and the Journalistic Function," p. 323.
[18] "America's Media Baronies," *Atlantic,* June 1969, p. 83.
[19] Computed from data in FCC, *36th Annual Report,* 1970, p. 157.
[20] Council of Economic Advisers, *Annual Report,* 1969, p. 310.
[21] Computed from data in FCC, *Annual Report,* 1970, pp. 153 and 164.
[22] *Broadcasting,* Sept. 6, 1971, pp. 56–57.
[23] *Ibid.,* p. 57.

more modest. Second, at least some of the high profits reflect the fact that television obtains one of its key resources—scarce spectrum or frequency allocations—without charge. Television's frequency space has many alternative uses: land mobile communications, inter-city microwave relays and domestic satellites, to name a few. A scarce resource is usually allocated to users that can pay the highest price. The absence of a price for spectrum should not obscure either the social cost of foregoing alternative uses or the private benefit from the gift to the television industry of a valuable resource.

A third qualification is that the average profit rates cloak a division between high and low profit sectors. The highest profits are earned by the networks. In 1969, the networks and the fifteen stations they owned earned 40 percent of the industry profits and their profit rate, before taxes, on net tangible broadcast property was 127 percent.[24] Among stations, VHF broadcasters (most of which are network affiliates) received the remaining industry profits and a rate of return of 78 percent on net tangible broadcast property. Among this group, profitability was widely dispersed, with 14 percent having losses. Affiliate profits are the highest in the largest cities. Indeed, in 1970, 70 percent of network profits came from the five affiliates each owns in the largest cities. The rate of return for affiliates in the largest cities must be very high—perhaps 200 or 300 percent on tangible investment. The low-profit component is composed primarily of the UHF stations. Ninety-six percent of non-affiliated UHF stations had losses in 1969, as did 49 percent of the affiliates. In 1970, 87 percent of the independents and 57 percent of the affiliates were in the red.

THE LEGISLATIVE ORIGINS OF TV REGULATION

Television broadcasting is generally considered to be a regulated industry, but the scope of broadcast regulation differs radically from regulation in other industries. The regulation of radio broadcasting resulted from the problem of frequency assignment. Initially radio broadcasting was open to all comers, but by 1922, only two years after the first commercial broadcast, interference became a vexing problem. Time allocation agreements among local broadcasters proved to be unsuccessful in overcoming the interference problem. The Department of Commerce began licensing stations in 1923. This practice was institutionalized through the Federal Radio Act of 1927, which created the Federal Radio Commission and required that all broadcasters be licensed by the Commission. Licenses were to be granted for three years, but only if the Commission determined that the award would serve "the public interest, convenience and necessity." [25] When more than one group applied for a given frequency assignment, the Commission was to select the applicant that would best serve the public interest. Licenses could be transferred only with the Commission's approval, and could be revoked for misconduct, but censorship powers or control of program content were specifically denied the Commission. In 1934 the Federal Radio Commission became the Federal Communications Commission as the power to regulate the telecommuni-.

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[24] All figures in this and the following paragraph are computed from FCC *Annual Report*, 1970, pp. 152–64, and *Broadcasting*, Sept. 6, 1971, pp. 56–57.
[25] There are provisions of the Radio Act of 1927, 44 Stat. 1162 (1927).

cations was added to the agency's responsibilities; however, its license-
ing powers were maintained virtually intact.[26]

The distinctive feature of broadcast regulation is the focus on licens-
ing as the essential regulatory power. While other agencies, such
as the transportation and power regulatory commissions, controlled
entry by requiring that certificates of convenience and necessity be
required for entry into the sectors they regulated, these certificates
not only were for indefinite terms, but also were of secondary impor-
tance compared to the regulation of profits and prices. The emphasis
on licensing in broadcasting results partly from the fact that the FCC
is specifically denied the power to regulate rates or profits in broad-
casting, whereas rate regulation is the central feature of the conven-
tional regulatory approach, and even in the regulation of telecommuni-
cation by the FCC.

The Communications Act of 1934 also makes the antitrust laws ex-
pressly applicable to broadcasting and provides for the preservation
of competition. In contrast, the legislation establishing regulation in
other industries provides for statutory exemption from the antitrust
laws for specific types of transactions.[27] Together with the limitation
on rate regulation, this provision indicates that Congress intended for
competition to play a greater role in broadcasting than in other regu-
lated industries. The Supreme Court has explicitly noted the differ-
ence between broadcasting and other regulated industries:

> The sections (in the Communications Act) dealing with broadcasting demon-
> strate that Congress has not, in its regulatory scheme, abandoned the principle of
> free competition, as it has done in the case of the railroads, in respect of which
> regulation involves the suppression of wasteful practices due to competition, the
> regulation of rates and charges, and other measures which are unnecessary if
> free competition is to be permitted.[28]

Legislators were also concerned over the geographic distribution of
licenses. In 1928, Congress passed an amendment to the Federal Radio
Act which divided the nation into five broadcast zones and required
"equality" of radio reception and transmission in each zone. This
amendment was replaced in 1934 with a provision that required the
FCC to distribute licenses so as "to provide a fair and equitable dis-
tribution of radio services" to the "several states and communities."

This provision is the basis for what has come to be known as the
FCC's "local service" objective—to have stations in as many localities
as possible. The power to grant licenses in the public interest was the
origin of two other FCC objectives—achievement of an acceptable
level of diversity in program content and the fulfillment of broadcast-
ing's role as public servant. As noted above, the FCC's fourth major
objective is the maintenance of an acceptable level of competition.
The problem, of course, is that these four objectives are conflicting.
Recognizing this conflict is crucial to an understanding of the di-
lemmas the FCC has faced.

The Primacy of the Local Service Objective

An idealized view of FCC policy-making would have all four ob-
jectives standing on a par and the FCC making difficult trade-offs

[26] Communications Act of 1934, 48 Stat. 1102 (1934).
[27] For an extensive investigation of the applicability of procompetitive policies and
laws to regulated industries, see Almarin Phillips (ed.), *Competition and Regulation*,
Brookings Institution (forthcoming).
[28] *FCC v. Sanders Bros. Radio Station*, 390 U.S. 470, 474–485 (1940).

between them in each of its decisions. But the FCC's record shows little willingness to compromise the local service objective for any of the other goals. The FCC has paid a high price in terms of its other objectives in dogged pursuit of localism.

The FCC Vision of Television

The primacy of local service reflects a deep-seated view of how television ought to be organized. The FCC view had its origin in the initial broadcast legislation quoted above; however citing the statute is not enough to explain the FCC's strong preference for local service. The language of the law is general, and other provisions, such as the general admonition to promote competition, could have been given priority, or at least equal weight.

The FCC's vision of broadcasting was developed gradually, reaching maturity only in the 1950's. The vision can be characterized as follows. As many communities as possible would have a local television station. Larger communities would have several stations, but only to the extent that enough channels were available for small communities as well. Stations would be owned and managed by local residents, and would devote considerable broadcast time to programming that provided information and commentary on important local issues and served to bring the community together. The stations would be instruments for community enlightenment and cohesion—much as the hometown newspaper of an earlier era.

From this vision sprang three specific FCC policies: (1) reservation of channel allocations for many communities where, for many years, no entrepreneur was willing to launch a station, (2) the encouragement of the development of UHF to provide more local stations, and (3) concern about the ownership of stations.

Localism and Station Assignments

The localism doctrine began with the granting of radio licenses. While a few high-power, "clear-channel" regional stations were authorized, the vast majority of radio stations were low-power operations whose daytime signal could carry only a few miles. The localism tradition carried over to television. Beginning in 1945, the FCC distributed VHF licenses in such a way that as many cities as possible had stations, and regional stations were permitted only in the sparsely populated mountain states. By 1948, the VHF spectrum then available for television was fully allocated, and for the next four years no licenses were granted while a master allocation plan was devised.

The key issue was the choice between local and regional television stations, forced by the scarcity of VHF spectrum. The regional station concept centered around powerful transmitters receivable over a large area. With regional stations, most of the country could have received four to seven VHF channels. The local station concept would reduce the power of each station, permitting many more communities to have their own station, but reducing the number of channels any given viewer could receive. Localism won out: providing as many communities as possible with their own station was given priority over allocating even one channel for regional broadcasting in most of the country.

The new allocation plan was challenged by DuMont. In attempting to provide a fourth national network service, DuMont was stymied by an insufficient number of VHF affiliates, as well as by doubts that advertising revenues would be sufficient to support four networks. DuMont proposed the establishment of regional stations to carry its network programming. Implementation of this proposal would have resulted in more competition among networks, with four national networks on VHF for the viewer to choose among; however, in order to provide clear channels for powerful regional stations, the total number of stations in the nation would have been reduced. The FCC made its preference clear, stating that:

> The Commission cannot agree with the DuMont principle that an overriding and permanent objective of a national television plan should be the assignment of four commercial VHF stations to as many markets as possible. . . . In the Commission's view as many communities as possible should have the opportunity of enjoying advantages that derive from having local outlets that will be responsive to local needs.

To put the issue another way, the Commission decided that the public interest was better served by having three networks carried by local stations than having four networks, some of which would be available from stations located in neighboring cities. Greater value was attached to local stations as opposed to more options and another network.

The Promotion of UHF

The only way to have both more options and localism is, of course, to have more stations. The shortage of VHF assignments meant that additional stations must be located in another part of the frequency. In 1952 the FCC announced a new station-allocation plan, which added UHF stations to communities already having some VHF stations. The difficulties of UHF were recognized from the outset—most sets were built for VHF reception, UHF tuning was more difficult and UHF signals were poorer. Still the Commission had a touching faith that economic growth and technical improvements would solve the problems of UHF. The Commission stated in 1952 that:

> "We are convinced that the UHF band will be fully utilized and that UHF stations will eventually compete on a favorable basis with stations in the VHF. We are persuaded that the differences in propogation characteristics will not prevent UHF stations from becoming an integral part of a single service. Further there is no reason to believe that American Science will not produce the equipment necessary for the fullest development of the UHF."

UHF began auspiciously. In 1954 half the television stations were UHF and almost one-fifth of the TV sets manufactured were capable of receiving UHF. By 1962, 37 UHF stations had gone off the air and the fraction of new sets capable of receiving UHF was down to one-tenth.

The Commission tried to solve the UHF problem by promoting the All Channel Receiver Act [29-30] in 1962, and in a few years almost all sets will be able to view UHF. Nevertheless, UHF still suffers technical disadvantages. Some claim the "continuous" tuner, similar to the tuner used on radios, discourages UHF viewing, and now "click" tuning of UHF channels must be incorporated into all new sets by 1974. A far more serious problem is the technical difficulty associated

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[29-30] PL 87–529, 1, 76 Stat. 150 (1962).

with receiving a good UHF picture more than a few miles from the transmitter of even a very powerful station.

The fundamental problems of UHF stations are small audiences and low revenues, and hence, an ability to provide only low budget programming.

The deep-seated nature of the UHF problem is indicated in Table 2. Almost all UHF stations have substantial losses. UHF stations cannot be financially viable unless commercial television is drastically reorganized. And yet this financially troubled sector of television has been the FCC's major instrument for providing more program options, more diversity and more competition for the VHF network affiliates. Much of FCC policy over the past twenty years has been designed to shield UHF stations from competition so that they can become financially viable. Restrictions on station power (and hence regionalization), prime-time programming by networks, and cable television are, in effect, subsidies to broadcasters intended to make UHF stations successful.

THE BENEFITS OF LOCALISM

The benefits of localism have proved to be relatively small. The objectives sought for are summed up in a statement by former FCC Commissioners Cox and Johnson:

Congress has created the present scheme in order to promote specific policies and specific kinds of programs. A system of locally based stations was deemed necessary to ensure that broadcasting would be attentive to the specific needs and interest of each local community. It was also considered a guarantee to local groups and leaders that they would have adequate opportunity to expression. Ultimately, our broadcasting system is premised on concern that the very identity of local states and cities might be destroyed by a mass communication system with an exclusively national focus.[31]

TABLE 2.—LOSSES OF INDEPENDENT UHF STATIONS—1969

Total loss: $33,298,000 (excluding 2 stations in the 101–150th markets). Of 48 stations reporting, 46 had losses.

Distribution of losses

	Number of stations
Amount of loss:	
$50,000 to $100,000	3
$100,000 to $200,000	8
$200,000 to $400,000	10
$400,000 plus	25

Loss by market size

[In thousands of dollars]

Market	Loss	Revenues	Expenses
1 to 50	$29, 310	$31, 258	$60, 568
51 to 100	2, 381	1, 825	4, 206
101 to 150	(¹)		
151 to 200	(²)		
200 plus	1, 607	676	2, 283
Total	33, 298	33, 759	67, 057

¹ Only 2 reporting.
² None reporting.

Source: "FCC Annual Report," 1970, p. 159, and FCC Broadcast Bureau Research Division, unpublished data.

[31] Kenneth Cox and Nicholas Johnson, *Broadcasting in America and the FCC's License Renewal Process: An Oklahoma Case Study*, FCC, 1968.

Almost all of the programming broadcast over the local station has a national focus. The network affiliates, which constitute the vast majority of VHF stations, rely on the networks for nearly all of their prime-time programming. Of the remaining program time, a high proportion is devoted to non-network films and other national programming. Outside of prime time, the reliance is less, particularly for affiliates of ABC which has less daytime network programming. Still, the majority of daytime television is network programs, and when network shows are not carried, the programs are largely films, reruns of network shows, and occasionally first run syndications. Local programming consists primarily of local news, weather and sports, with only an occasional bit of other programming.

Independent stations are not much different. Most independent programming consists of new or rerun syndications and movies. Many independent stations, particularly in the UHF band, go off the air in the daytime and late evening rather than broadcast local programs.

The nature of television programming was revealed by Commissioners Cox and Johnson in their examination of ten television stations in Oklahoma. Local programming by these ten stations accounted for less than 20 percent of prime time and about 10 percent of daytime programming.[32]

News, weather, and sports accounted for half the local programming, and almost all of the prime time local hours. The additional local service included one to three hours weekly of religious broadcasting on Sunday morning, when the impious are asleep and the pious are in church, some daytime talk shows, and a single local entertainment program. Public affairs accounted for a very small proportion of local program hours. Tulsa stations presented more public affairs than most: in a composite week one station presented three weekly two-minute editorials, another a daily half-hour talk show, and a third presented a daily fifteen-minute afternoon discussion program.

Oklahoma is not atypical. The Commission held hearings in Chicago and Omaha which showed, according to Commissioners Cox and Johnson, metropolitan TV stations originated relatively little programming of their own and what local programming they did put on consisted mostly of news, weather and sports. Commissioners Cox and Johnson report on their survey as follows:

> As far as Oklahoma broadcasting is concerned, the concept of local service is a myth. With few exceptions, Oklahoma stations provide almost literally no programming that can meaningfully be described as "local expression." They provide very little that can be considered tailored to specific needs of their individual communities—[This conclusion is not necessarily] an indictment of broadcasters of this particular State; it is unlikely that their performance differs from the performance of broadcasters in other States."

One other less-mentioned rationale for local stations is that they serve as an advertising medium for local merchants. Here the localism role is somewhat more important, but the broadcasters still earn over 75 percent of revenue from either network or national spot messages of national advertisers.[33] Paradoxically, independent stations earn more of their revenue from national advertising than do network affiliates.

[32] These and the following data are from Kenneth Cox and Nicholas Johnson, cited above.

[33] FCC Annual Report, 1970, P. 155.

Local Program Profitability

The reasons for the failure of the original FCC vision is not hard to find. Local programming is not as profitable for station owners as network programing. The difference in profitability simply reflects the fact that a program of the same quality shown nationally is obviously much cheaper per viewer. A typical half-hour evening network show costs about $110,000 to produce, but with an average share of the nationwide audience the cost per viewing home is only about one cent. At the same cost per viewer, and with the same share of the local audience, the individual station in a market with a million homes can afford only $1,500 for program costs—an amount sufficient to pay only minimum talent fees for a program not much more elaborate than a talk show with a master of ceremonies and mostly volunteer guests. For the most part the viewing audience prefers highly professional talent—most viewers would prefer to watch pro football rather than local high school games. Locally produced programs, therefore, have low audience ratings. Advertising revenues for local programs are correspondingly low. This means that such programs necessarily are very low budget productions—which serve to further reduce their audiences—even though they are often much more expensive per viewer than national programming.

This combination of significantly higher costs and lower revenues means that station owners are much more attracted to the more profitable national programs. The exception is local news and weather, which often draws good audiences, is cheap to produce, and, hence, is reasonably profitable.

Mandatory Local Programming

The premise of localism is that more local programming serves the public interest. But this is not as obvious as the adherents of more local programming imply. The viewers, by their program choices, have clearly voted for national programming. Such programs typically outdraw local programs by many orders of magnitude. If television were judged like moving pictures, for example, the industry would be given plaudits for giving consumers what they want.

Some argue that television is fundamentally different than most products or services and that consumer sovereignty should not apply. Local programming is different from other products because this programming does more than fulfill consumer wants; it serves an allegedly important public function. Commissioners Cox and Johnson are eloquent on this:

The greatest challenge before the American people today is the challange of restoring and reinvigorating local democracy. That challenge cannot be met without a working system of local broadcast media actively serving the needs of each community for information about its affairs, serving the interests of all members of the community, and allowing all to confront the public with their problems and proposals.

The minimal local programming now available hardly serves this purpose. It would not suffice to make stations broadcast more local programming even in prime time since most viewers would turn to competitive channels with network programming. Serving the public interest as visualized above requires that the local program be seen

by a large fraction of the population. The effective way to achieve this would be to set aside certain prime time hours in which *all* channels must carry local programming. The FCC's recent decision to limit the amount of prime-time programming by networks is a step in this direction, although it was also designed to improve the market for non-network national syndication.

We have considerable doubts about obligatory local programming and, in effect by withdrawing the alternatives, about making viewing semi-compulsory. Yet anything less seems likely to add little in terms of the grand objective which local programming is supposed to serve. The harsh reality is that most viewers do not want to sacrifice even a small fraction of national entertainment to their obligation as local citizens. The present television stations provide most viewers with the kind of programming they want. If the most desired policy of the local station is that it serve primarily as a conduit for national programming, then the rationale of the FCC mania for localism becomes highly questionable. Localism seems a policy that *has* produced very small benefits, and that *could* produce very little more even if its objective—more local programming—could be achieved.

The Costs of Localism I: Fewer VHF Stations

Historically the most important cost of localism is the limitation on VHF viewing options that it has caused. Although there are twelve VHF channels, no more than seven can be used in any one area since the remaining five must be left vacant to prevent adjacent channel interference. Stations must also be substantially separated geographically to prevent co-channel interference. These twin requirements for avoiding interference place technological limits on the number of VHF signals that can be broadcast if each community is to be able to both receive and transmit signals different from those in nearby communities.

Total abandonment of localism in television broadcasting would make reception of seven VHF signals technically feasible for nearly all homes. This level of service is presently enjoyed only by residents of Los Angeles (New York has six VHF stations; no other city has more than four). Any one of the channels in such a system would carry the same programming throughout a wide region of the country. Regional transmitters would replace the local stations in the present system. National networks of regional stations would result in most programming being provided from one central point. Some programs, however, would undoubtedly be produced by the regional stations. And in a particular region, not all seven channels need be programmed from the same geographic location. Rather, each channel could be programmed from a different city. Thus, one might envision each major city in a region being assigned one or two origination points with some of the programming oriented to the station's home area.

A seven-channel nationwide system would differ from the existing system in the following ways:

1. Since no programs would be locally originated, no television advertising would be local. Except in regional centers and communities

situated in mountainous terrain, local broadcast facilities would be eliminated. To provide regional programming, a few stations would be retained in the larger cities; however if national programming were to be relied on exclusively, only a single production center for each of the seven national systems would be required. The programming from the national production center would then be broadcast over a system of repeater transmitters, eliminating all existing local production facilities.

2. Each of the seven national networks would incur costs of origination, interconnection, sales, administration and general operation of roughly the same amount as is now incurred by each of the three existing networks.

3. Each of the seven national networks would also be faced with program costs, as would all of the regional stations if something other than national programming is to be offered. Undoubtedly the new arrangement would result in fewer of the nation's resources being devoted to program production: the national programming would require essentially the same amount of resources as now devoted to producing programs for the three networks and the strong independents in the largest cities, and the regional programming would involve fewer resources than present local programming since there would be far fewer stations.

Programming expenditures would differ from their costs in the present system. Briefly, this difference would arise because some of the present expense of programming represents rents to program owners and talent, rather than the price necessary to encourage program production. Since the advertising revenue which any program would generate in the seven channel system would probably fall short of its revenues in the existing system, the rents extracted by program owners and talent would also fall.

Based on these observations, estimated revenues, costs, and profits of the seven channel system are presented and compared with the present system in Table 4. The notes to that table provide more detailed information on the derivation of the estimates.

If history could be rewritten so that the FCC had created a nationwide broadcasting system and set localism aside, a nationwide system of the kind in Table 4 might well have emerged. Our estimates indicate the alternative system would have been more profitable and less costly to the economy than the present local-station system. But profits per network would fall by about $75 million.

The Value of Increased Viewing Options

Using an analysis of the demand for television options presented elsewhere,[34] estimates were made of the value to consumers that would be generated by providing all communities with seven channels of viewing options comparable to those available to residents of Los Angeles. The additional value to consumers would amount to somewhat more than 1 percent of personal income or, in 1972 prices, to more than $8 billion.

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[34] See the authors' book, *Economic Aspects of Television Regulation.*

TABLE 4.—ECONOMIC FEASIBILITY ANALYSIS OF THE 7 CHANNEL NATIONWIDE SYSTEM

[In millions of dollars]

	Present system	7 channel system	Changes
Total revenue[1][2]	2,520.9	2,270	−250.9
Total costs	2,000.2	1,593	−417.2
Signal distribution[3]	192.1	217	+15.1
Programing[4]	1,265.5	1,135	−120.5
Selling[5]	155.6	65	−90.6
Administrative and general[5]	387.0	176	−211.0
Profit	520.7	677	+156.3

[1] All figures are in millions of dollars and are based on costs of the present system in 1968.

[2] Total revenue: Total revenues of the present system, exclusive of local advertising, were approximately $2,133,000,000 in 1968 while the average prime time audience was 34,500,000 homes. Thus each full time equivalent prime-line viewing home was worth $61.70 in national advertising revenue per year to the system. The 7 UHF channels in Los Angeles attracted, on average, 64 percent of television homes in the Los Angeles ADI (area of dominant influence). Thus we estimate the national audience of the 7 channel system at 36,800,000 homes (equals 0.64 times 57,500,000 TV homes). National revenue of the system is thus estimated at 36.8 times $61.70 equals $2,270,000,000 per year.

[3] Signal distribution: This estimate is composed of 2 elements. The 1st represents the annual cost of 7 transmitters in each of the 204 communities which contain 100 percent of the TV homes in the country. At an annual cost for depreciation maintenance and operation of $85,000 the system cost for transmitters is $121,500,000 (equals 1,428 times $35,000). The 2d component represents an estimate of signal origination costs. In the existing system the 3 networks incurred technical costs of $40,900,000 in 1968. These costs for the 7 channel system were estimated as 7/3 times 40.9 equals $95,500,000.

Together, these estimates imply signal distribution costs of $217,000,000 for the 7 channel system.

[4] Programing costs: In the text it was argued that reported programing costs will be highly responsive to potential revenue. In our present system payments for programing are equivalent to ½ total revenue and this is the basis of the estimate of $1,135,000,000 of the 7 channel system. In the 7 channel system programing expenditures might be higher than this. In particular, they might rise to 60 percent of revenue, the proportion of network revenue paid for programing by the 3 networks in the existing system. However, this would only be likely to occur if there were an increase in the supply of network-type programing which might be expected to lead to higher revenue as well as higher costs. In any event, it seems likely that for the level of expenditures which we have estimated, programing of the quality presently available in Los Angeles, which attracts 64 percent of local TV homes, could be acquired by the 7 channel system.

[5] Selling, administrative and general expenses: These expenditures were estimated at 7/3 of the corresponding expenditures by the existing networks. An alternative procedure would be to base the estimates on the ratio of such expenditures to total sales for the networks in the existing system. This procedure leads to slightly lower estimates of these expenditures or the 7 channel system.

For several reasons, this estimate may be biased upward, but at least a lower bound on the estimate of the value of additional viewing options can be derived from the experience of a CATV system in San Diego, California. The San Diego experience indicates that, on a national basis, consumers would find four additional viewing options of the quality of Los Angeles VHF independents worth $2.6 billion per year. Thus it would seem reasonable to place the value to viewers—and hence the cost of localism in terms of the value of foregone viewing alternatives—of four more networks at $3–$8 billion annually. Taking the midpoint of this range, the annual cost of localism is roughly $100 per television home.

This $100, in effect, purchases the nightly local newscasts and a modest amount of local programming. The local news programs draw about half the viewership of network programs, though they are placed earlier in the evening. (This is in part because they are considered less popular programs.) Other local programs seem to draw substantially fewer viewers than the newscasts, and, as noted earlier, they represent few hours of the weekly programming. We frankly doubt that every television home in the country regards the present level of local programming worth $100 per year, or alternatively that many homes would pay a multiple of $100 to offset those that would pay nothing. Recall that $100 is equivalent to the controversial 1967 income-tax surtax that Congress took ten months to pass. It would be 20 percent of typical family expenditures on recreation and entertainment.

The FCC decision for localism is not defended on the grounds that it contributes to maximizing viewer satisfaction. Rather it is held to

have major social benefits in terms of the political process and community cohesion which have turned out to be largely unrealized hopes. Yet there are also social benefits in reducing the present power of the three networks by providing four new competitors.

The Costs of Localism II: Repression of Cable TV

The promise of cable is that it will drastically reduce the present scarcity of channels that accounts for so many of the problems enumerated earlier—limited program choice, little diversity, and highly concentrated control. Cable systems can provide 12, 20, 40, or even more channels instead of the four or five that are now typically available over-the-air. Yet the cable promise is still just that. Cable serves 8 percent of all television homes, largely in areas with few or even no over-the-air signals. In the top one hundred television markets, with 87 percent of the viewers, the FCC until recently prohibited cable from carrying the signals of stations in distant communities. A ban on signal importation eliminates one of the incentives for subscription—a greater choice of programs—and thus reduces the number of subscribers.

Even among those who concede the necessity of signal importation, doubts about its desirability arise because of its potential impact on existing broadcasters. Bringing in distant signals, mostly independents, increases viewer choice (presumably a good thing) but could reduce broadcaster profits (perhaps a bad thing). This issue involves more than a simple choice between the interests of viewers and broadcasters. One can imagine a world in which the increased competition brought by cable changes present over-the-air broadcasting so drastically that many viewers are made worse off. We believe that such a result is unlikely. Lower broadcasting profits will result from signal importation, but the services provided by broadcasters will change only slightly.

Whether a cable system can meet its costs, including the profits necessary to attract the required capital, depends largely on "the penetration rate"—the percent of homes in a wired locality subscribing to cable service. The penetration rate is a key variable because in a typical system three-quarters of the capital costs, and an even larger proportion of the operating costs, are either totally fixed or set by the number of miles wired. Adding another subscriber in an area already wired adds relatively little to costs. Thus the greater the density of subscribers, the more revenue is available to cover the fixed cost of wiring a locality. Elsewhere we have presented estimates of cable penetration under various assumptions about signal importation rules.[35] Several aspects of these estimates are worth emphasizing. First, in the absence of distant signal importation or some other major addition to viewing options that stimulates penetration, no more than 15 percent of the television homes in the 100 largest markets can be expected to subscribe to cable television. Second, distant signal importation alone is sufficient to change dramatically the likely level of cable penetration. Third, the estimates suggest that penetration will in no case exceed 70 percent in the foreseeable future so that there will continue to a be a substantial public interest in maintaining over-the-air

[35] See Appendix B, *On the Cable* (Report of the Sloan Commission on cable communications), McGraw-Hill, 1971.

broadcasting; therefore the possible impact of cable growth on the viability of over-the-air broadcasting cannot be ignored.

The common objection to signal importation is that it might jeopardize the financial viability of over-the-air broadcasting. The danger is often stated in terms of audience losses by local stations, without recognizing that the audience losses are to imported signals also originating with broadcasters, albeit in different localities. Obviously there are gainers and losers; to assess the impact of signal importation we need to evaluate the shifts in audience and their consequences. As FCC rules have required for some time, we assume that cable carries all local stations and we also assume local network affiliates do not have their signals duplicated—i.e., no imported network signal is brought in to compete with a local affiliate of the same network.

Who Loses: Local Stations and Local Audiences

For a national cable system carrying four imported stations, we have estimated losses in audience for local stations for various markets classified by the number and type of over-the-air stations available.[36] In only two instances does this system seriously erode local audiences. VHF independents lose local audiences, but as discussed subsequently, these stations are likely to be exported and so gain distant audiences. Network affiliates in single- and two-station markets suffer audience declines of 50 and 30 percent, respectively, although their losses are primarily to the imported networks. Seven of the top one hundred markets have only two network affiliates and one has a single network affiliate. Paradoxically, of the 124 television markets of smaller size, 81 are one- and two-network markets, yet here the FCC has not significantly restrained signal importation.

The effect of widespread signal importation can be roughly approximated by the existing fragmentary data. Network affiliates might lose between 10 to 20 percent of the cable audience to imported independent signals. If half of the homes subscribe to cable, the national loss in network audience—and consequently of advertising revenues—will be between 5 and 10 percent, with a best estimate of approximately 7 percent. Since profits as a percent of sales for networks and affiliates taken together are about 20 percent, signal importation should cause network system profits to fall about one-third, assuming no cost or price adjustments to the lower earnings. The networks would lose about $10 million apiece; the major burden of the losses, about $150 million, would be borne by affiliates.

The advent of nationwide signal importation would reduce after-tax profits of affiliates in areas served by cable to 30 percent on tangible investment. While the affected affiliates would still be more profitable than most of American business, there would be an enormous reduction in the book wealth of station owners through a decline in the resale value of station licenses. That resale value, in effect, capitalizes the excess returns from station ownership, and explains why licenses sell at such high figures. From the viewers' point of view, profitability would be sufficient to keep the present affiliates operating. The day-to-day operations of a station are not affected by the market value of the license as long as the station shows an operating profit.

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[36] A detailed explanation of the derivation of these estimates appears in their book.

The situation for UHF independents is quite different.

UHF stations on cable increase their audience because the effect of the UHF signal improvement provided by cable swamps the losses from increased competition. Still with 96 percent of the UHF independents operating at a loss their picture is so bleak that even a doubling of audience—sometimes now less than 1 percent of the market—will not pull many stations into the black. Most of these stations now operate only a few hours a day; costs would be much higher if a full broadcast day were attempted. Very large revenue increases are necessary to make these stations financially secure enough to provide services anywhere approaching the role originally envisioned for them by the FCC when the UHF frequency allocation was made 20 years ago. Signal importation then helps UHF independents, but not enough to eliminate the "UHF problem."

UHF affiliates should do much better since cable will, in effect, convert them to VHF affiliates for the cable audience. Since half are already profitable, the change is likely to make this sector financially viable.

The Audience Gains of the VHF Independents

The four imported signals assumed above would be independents, except for the few small markets which would also have imported network signals sufficient to provide three-network service. Without regulatory restraints, the four imported independents would be drawn primarily from VHF stations. The VHF independents lack the signal disadvantage of the UHF stations, and all but three are located in the top 20 markets. As a result, these stations have more substantial audiences than UHF's, resulting in revenues sufficient for more extensive programming including first-run syndications, originations, and more expensive movies and network reruns. Since they have better programming than most UHF stations, cable operators will choose to import VHF independents since their signals will improve their penetration more than will UHF stations.

VHF independents would gain revenue from access to distant cable audiences. Of course, a local viewer is worth more than a distant viewer since local advertisers are unwilling to pay for the latter. National advertisers are largely indifferent to whether their messages reach San Diego via an imported signal or the local stations. VHF independents now earn anywhere from 50 to 85 percent of their revenues from national advertising. With signal importation, more national advertising would appear on these stations, with local advertising shifting to affiliates or UHF stations. Indeed, eventually VHF independents may only have national advertising, but to be conservative distant viewers are assumed to be worth only two-thirds as much as local viewers in advertising value.

Even then, big city independents should be able to make up their revenue loss in local markets by gains in distant markets. According to our estimates, the independent's share in a market with three VHF independents will go from 3.4 percent to 2.4 percent of the local cable homes because of signal importation, a loss of 1 percent. Its share on distant cable homes would be 3.2 percent, but since these distant homes are worth two-thirds in advertising value, this is equivalent to a 2-percent market share in the home market. One distant cable home, then, makes up for the lost audience from two local homes on cables.

Two-thirds of the television homes are in markets now without VHF independents, so that these big city independents should have little difficulty in finding sufficient distant markets to increase their revenues.

The twelve VHF independents outside New York and Los Angeles will lose more local audience since, without importation, they now have the advantage of being the sole independent available to viewers. Even so, they are also likely to be net gainers, for on the same basis as preceding calculations, they would need to be imported by cable systems equal in size to the cable systems in their home markets to recoup their revenue loss. Since these stations are the strongest independents in their regions, they should be distributed widely. Indeed in the Midwest and South there will be a shortage of eligible VHF candidates for signal importation, and either UHF stations or New York and Los Angeles independents will be needed to fill out the four imported signals.

Programming and Signal Importation

It is also argued that signal importation will lead to lower quality programming. Signal importation shifts audiences from networks to independents, and the shift itself will be a limited one. Most of the revenue losses of the network system would come from their profits, with the extent to which they reduce their program spending limited by continued competition among networks for audience.

Less spending by networks and affiliates is likely only in the two unprofitable program categories—local originations and public service broadcasts. Both categories are carried in response to regulatory pressures or as a public service contribution. With lower profits, managements may be less willing to make such contributions, and the leverage of the regulators will be lessened. It is important to remember that both kinds of programming are now a very small proportion of the broadcast schedule.

Network public service programming (such as documentaries) now accounts for about 5 percent of network prime time, and "heavy" drama and music account for another 2 or 3 percent. Even the most successful of these programs seldom draws an audience share comparable to entertainment programming. (Table 5)

Entertainment programming (including sports) constitutes the major portion of present television programming and accounts for most of the viewership. Here we are concerned with the relationship of networks and stations to the programming industry since program production firms account for most of the entertainment shows.

As a result of signal importation, VHF independents would be a more lucrative market for the program producers. Indeed, they will be, in effect, regional networks, and simultaneous sales to only a few strategically-located, big-city independents could give a program almost nationwide coverage. This would mean more attractive alternatives to the networks for the first-run syndicators. Program producers will be in a better bargaining position with networks and those that cannot obtain network showing will do better in the non-network market.

TABLE 5.—DOCUMENTARY SPECIALS TELECAST IN PRIME TIME BETWEEN OCTOBER 1967 AND APRIL 1968

Program	Percent of homes viewing[1]	Rank in time period
Dean Rusk Senate Hearing	10.3	3
Gold Crisis	10.8	3
Dr. Barnard/Heart Transplant	15.5	2
America and the Americans	12.3	3
Can You Hear Me?	12.1	3
Childhood of Timmy	9.5	3
Confrontation	8.9	3
The Actor	6.5	3

[1] 15 percent is generally regarded as the minimum audience size a regular series must draw to be renewed.

Source: Herman W. Land Associates, "Television and the Wired City" (National Association of Broadcasters, 1968), p. 127.

The independents will still have a lower audience potential than the networks. This limits the competition for programs and suggests that they will still rely to some degree on reruns of network shows. The shift of audience to independents and away from networks will raise rerun revenues, since potential and actual audience size is reflected in the syndication price, thereby offsetting some of the loss to the networks. On balance, too many factors mitigate against the possibility of declining program quality on networks to make this eventuality a serious threat. To the extent it does occur, it will be because the imported independents become stronger, offering programs closer to network quality.

The Benefits and Costs of Cable Development

To evaluate the costs and benefits of various aspects of cable development requires bringing together the several strands of our analysis.

The model of consumer demand used above permits a very rough estimate of the change in consumer welfare from imported signals. For those homes that would subscribe, cable yields a gain of about 1 percent of consumer income. With half the homes in the nation subscribing, the total gain would be $3.5 billion annually. The cost of the cable system (including minimum profits necessary to induce investment) is about $1.8 billion, making the consumer surplus about $1.7 billion annually—that is the difference between what consumers collectively would be willing to pay for the system and what they would actually pay. No great significance should be attached to the precise magnitudes—the point is simply that an unencumbered cable system represents a significant gain in welfare.

The potential benefits of cable to consumers are discounted only because most television reformers have little taste for commercial television. To expect them to count more commercial television as an important gain is analagous to expecting those who go barefoot to applaud improved performance in the shoe industry. But most Americans wear shoes and most are avid watchers of commercial television.

The other side of this gain in consumer welfare is that if it is sacrificed, a nationwide cable system will not develop in the foreseeable future. Without signal importation, cable will serve only 10 million homes. With extensive signal importation the number of subscribers rises to over 30 million, more than half the nation's television homes

and two thirds of the homes offered cable service. Signal importation is the key to the success of cable television.

One major social gain from signal importation is increased competition. To the extent the major independents grow to regional or even national status, they will become more effective competitors to the present networks. Fear of the networks' alleged political power and the complaints from actors, writers, and producers about the arbitrariness of networks stem from the insulation from competition that the networks enjoy. By increasing the power of the independents, cable can do much to alleviate these problems.

Few benefits come without costs, and cable is no exception. If only the costs to society and not to particular individuals are considered, cable is surprisingly free of drawbacks. Wiring the nation is expensive, but subscribers will willingly bear the costs. The major social cost is the reputed danger to over-the-air broadcasting. But cable will make VHF independents much better off and UHF independents somewhat better, with only the networks and their affiliates being losers.

The losses to existing networks can be viewed as the removal by competition of the benefits of a monopoly position. The loss will be in the value attached to the licenses of affiliates. The operation of stations will be little affected. Losses in wealth are still painful, and so network affiliates are likely to put up a considerable battle against cable expansion. A ban on signal importation for the largest markets is favored by these stations, although they would probably prefer its extension to include more markets. Strict enough limits on signal importation to prevent the development of cable would sacrifice nearly all of cable's potential benefits to protect about $200 million in network system profits.

The FCC's August 1971 letter of intent took a minimal view of the value of signal importation:

We have determined to restrict the carriage of distance signals to a relatively small number and hope thus to serve two purposes: first, to minimize the possibility of adverse impact on the existing broadcast structure and, second, to spur the development of the variety of nonbroadcast services that represent the long-term promise of cable.[37]

Two months earlier, FCC Chairman Dean Burch had expressed the Commission's policy objectives more explicitly as being composed of four "guiding principles":

(1) We are determined to devise a formula that will not undermine the existing broadcast system . . .

(2) We want to open the way for cable to bring needed television to underserved areas, to improve reception, and to make possible greater diversity of television programming . . .

(3) We would also allow cable to bring new and diverse services into the home . . .

(4) We intend to fashion cable policies that have the effect of promoting both UHF and educational broadcasting. UHF stations, in particular, are now at a critical stage of development, and they need a practical boost.[38]

Thus, distant signal importation is permissable only to the extent that it does not significantly damage the strong segment of the industry

[37] FCC 71–787, 63303, August 5, 1971, p. 6.
[38] Testimony of Dean Burch before the Communications Subcommittee of the Senate Commerce Committee, June 15, 1971, as reprinted in *Television Digest: Weekly CATV Addenda* Vol. 11 :27, July 5, 1971, p. 18–20.

(network affiliates and VHF independents) and substantially benefits the weak segment (UHF independents).

The November 1971 "accord" between the broadcasting and cable industries, arranged by the Office of Telecommunications Policy, took an even more restrictive view of cable development and signal importation.[39] Like the August position of the FCC, the accord proposes that cable systems in the largest markets be permitted to carry two distant signals—the number the August letter considered to be a "conservative" estimate of the "minimum number . . . that might reasonably open the way for cable development." [40] According to our statistical analysis of the determinants of the success of cable systems in attracting subscribers, two imported signals would make cable systems viable in most of the top 100 markets if the two signals were high-quality VHF independents. But the accord effectively prevents this by placing additional restrictions on which stations and programs can be imported. The most important feature is the "accord's" provisions for exclusive program rights. In the top fifty markets, programs cannot be imported if a local broadcaster has obtained exclusive rights to these programs. The "accord" sets no time limits on such exclusive rights. In the next fifty markets exclusivity is limited to two years. The "accord" will prevent importation of the best movies and first-run syndications. Many affiliates carry the prime time staples of big city VHF independents on daytime schedules. Such showings will black out these programs from evening time. The viewers' welfare is sacrificed, for daytime availability is hardly a substitute for a prime-time showing. This measure also means that imported VHF independents will be frequently blacked out. In fact, cable operators will have to switch back and forth among several stations to fill the time on the import channels. This will prevent the imported stations from receiving advertising revenues as a result of their larger audiences in distant cities, for no station will be certain of when a cable system is carrying its signal. This measure probably kills any prospect for VHF independents developing into challengers to the networks.

In the spring of 1972, the "accord," with a few changes, became the official FCC policy. It places the wiring of the nation—particularly in the top fifty markets with two-thirds of the homes—in jeopardy. Our calculations cannot estimate the likely penetration of such a restricted system, since present broadcasting has no counterpart to such a hybrid. Most likely, cable development will be stunted for another decade.

Even if cable development does occur, a great part of the gain in consumers' welfare that cable could have brought about will be sacrificed in order to leave the fundamental features of American television unchanged—extremely high profits, limited competition, and the emphasis on localism. The losses in consumer welfare cannot objectively be compared with the value of maintaining the essential features of the status quo. To skeptics about the value of the status quo, the sacrifice of consumer welfare achieves only a perpetuation of the current faults of the industry. But this view is not in accord with consumer sovereignty: the value viewers attach to the diversity provided by many commercial channels is what makes signal importation profitable. Nor is it in accord with the general policy maxim of promoting competition.

[39] *New York Times*, November 12, 1971, p. 1.
[40] Op. cit., p. 5 and p. 13.

CONCLUSIONS

The FCC's policies on regional stations, UHF development and cable television amount to subsidies of an industry structure that would otherwise prove uneconomic. The FCC seeks to promote certain types of programs that the vast majority of viewers rejects. With relatively few stations in each city, individual stations earn enormous profits—giving the FCC some leverage in forcing them to provide a minimum amount of "public service" (i.e. unprofitable) programming. To preserve localism yet still provide more options, the FCC turned to UHF. For various reasons, UHF proved to be a financial disaster—a situation which the FCC has tried to overcome by further limitations to competition, most notably the prevention of widespread carriage of the few VHF independents on cable television systems.

While the FCC has undoubtedly succeeded in keeping a few stations on the air, the most important effects of the Commission's policies have been to protect $200 million in network profits for the most profitable segment of the industry and meanwhile to sacrifice somewhere between $1.5 and $8.0 billion in net consumer welfare (above the costs of either a regional station system or a national cable television system). Society would be far better off if all of these indirect subsidies were made explicit. Paying networks $200 million and UHF independents $50 million (their current annual loss) is far less costly than preventing competition in the television industry. Similarly, purchasing time on commercial stations for public service programs, but permitting more competition, would be both more effective and less costly to national welfare than the present system, with its minimal public service efforts coupled with governmentally-created local monopoly rights.

AN ECONOMIC ANALYSIS OF FEDERAL FOOD SUBSIDIES

By MARION HAMILTON GILLIM*

SUMMARY AND CONCLUSIONS

Federal food subsidies amounting to approximately $4 billion in the fiscal year 1973 fall into two classes according to whether the recipients are households or children. The four programs of subsidies to households are food stamps, food distribution, supplemental food and food certificates; and the four serving food to children provide school lunches, special food service to non-educational institutions, school breakfasts, and the special milk programs. All are described as "in-kind" subsidies. The federal government uses the following three methods: (1) The sale at less than their face value or the outright gift to needy households of stamps or certificates good for the purchase of food; (2) the granting and shipping to the states of actual food for distribution to needy households in selected communities; and (3) grants of food and cash to the states for allocation among schools and non-residential service institutions to be used for serving breakfasts, lunches, and milk between meals to children. All have the dual aims of increasing the consumption of agricultural products and of feeding the needy.

An examination of the eight subsidies reveals a variety of interacting programs established at different times with different operating rules. The subsidies differ in geographical allocation, rules of eligibility, state responsibility for sharing the costs, effects on the incentive to work, power to augment food consumption, the amount of satisfaction brought to consumers, and the degree to which they may provoke dishonesty on the part of the recipient. The lack of uniformity must

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result in some duplication in administration and difficulties in the evaluation of the programs.

The largest of the food subsidies, the food stamp program, is the most open to criticism. It is complicated, not respectful of the privacy of the consumer, often causing unhappiness in the household over the required allocation of expenditures, augmenting food consumption by less than the amount of the subsidy, and offering ample temptation to illegal use of the stamps by dissatisfied recipients. While less complicated a process, food distribution is subject to the same difficulties of not increasing food consumption by the full amount of the subsidy, and of creating consumer dissatisfaction paired with the possibility of unlawful disposition of the food.

The meals served to children in schools and service institutions and "meals on wheels" to the elderly comprise the group of subsidies best designed for increasing the consumption of approved foods by the persons least able to provide for themselves. In addition, they probably do not foment dissatisfaction in the households with their pattern of expenditures or provide an opportunity for the consumer to cheat. As presently operating, they are subject to criticism for being uncoordinated and for lacking automatic adjustments to offset the effects of rising prices on the purchasing power of the federal cash grants to the states.

The chief recommendation is that studies be carried out to test the feasibility of the following suggested changes, the details of which would be worked out only after analysis and experimentation:

(1) The unification of all food subsidies into a single program.

(2) A means for automatic adjustments in the subsidies to protect the recipients from changing food prices.

(3) The substitution of cash for in-kind subsidies to households whether given indirectly in the form of stamps or directly in the form of food.

(4) An expanded program of information and demonstration of food selection and preparation to meet nutritional needs.

(5) An enlarged program of ready-to-eat meals served to children in schools and day-care institutions and to the elderly at home.

I. Introduction

The federal food subsidies in the United States are administered by the Food and Nutrition Service of the Department of Agriculture. They do not make up a unified, planned system, but rather one developed over a long period to meet problems as they arose with programs acceptable at the time. All can be described as giving a benefit-in-kind to the consumer. Although in some cases the subsidy-in-kind must have the same effect on the consumer's spending as a cash subsidy, the consumer receives no direct cash subsidy under any of these programs. Federal food subsidies make the food available to the consumer in three ways: First, households may obtain stamps or certificates to be used instead of money to buy food; second, households may receive packages of groceries; and third, food may be served ready to eat, usually to children in schools, camps, and other institutions. In the first category are the Food Stamps and the Food Certificate Programs;

in the second category are the Food Distribution and the Supplemental Food Programs; and in the third category are the programs for School Lunch, School Breakfast, Special Milk, Nonfood Assistance, and Special Food Service.

This paper separates these subsidies into two major groups according to the recipient of the subsidy. Section II, "Food Subsidies to Households," discusses the first and second categories as listed above, and Section III, "Food Served to Children" examines the third category. The analysis will emphasize the two largest and fastest growing food subsidies, the Food Stamp Program in Section II and the School Lunch Program in Section III.

The value of the federal food subsidies granted in both cash and commodities passed $3 billion in the fiscal year 1972 (see table 1). They had almost tripled between the fiscal years 1969 and 1971 and are expected to quadruple over the four-year period ending with the fiscal year 1973. At present, the food-stamp program provides the largest of these subsidies, the school lunch program is second in amount, and food distribution to needy families is third. The greatest increase has been forecast in the food-stamp program which is expected to be ten times as great in the fiscal year 1973 as in the fiscal year 1969, rising from over $200 million to over $2 billion. The school lunch program passed $1 billion in fiscal 1972, more than double its value in fiscal 1969. The estimated increases in the food-stamp program and the school lunch program are based on the expectations both of reaching more people and of providing a larger per person subsidy. Food distribution to the needy, however, is not expected to grow. Although it is being expanded into counties without a program, the food-stamp program is replacing it in a number of other counties.

TABLE 1.—THE COST OF FOOD SUBSIDIES TO THE FEDERAL GOVERNMENT IN BOTH CASH AND DONATED COMMODITIES, 1969–73

[In millions of dollars]

Program	Fiscal years—				
	1968–69	1969–70	1970–71	1971–72	1972–73 (est.)
Total	1,077	1,574	2,873	3,450	3,960
Food subsidies to households	455	848	1,858	2,169	2,433
Food stamps [1]	229	551	1,523	1,842	2,106
Food certificates		[b]	1	1	[1]
Food distribution to needy persons	225	289	321	313	[3[3]
Supplemental feeding	1	8	13	13	[13]
Food served to children	597	704	990	1,256	1,502
School lunch [3]	476	565	814	1,070	1,267
School breakfast	5	11	20	27	52
Nonfood assistance	10	17	37	18	16
Special milk	102	102	93	95	96
Nonschool food	2	7	21	43	65
State administrative expenses	[2]	2	4	3	4
Nutritional training and surveys	[c]	[a]	1	1	1
Other: Food Distribution to Institutions	25	22	25	[25]	[25

[1] Free stamps; estimate for 1973 is "program costs."
[3] Includes cash, commodity procurement, and surplus commodity distribution.

Source: Food Stamps, fiscal years, 1969–1973; Food Served to Children, fiscal years 1970–1973, "The Budget of the United States Government," fiscal year 1973, appendix, pp. 203–4; and . . . Budget . . . 1974, appendix, pp. 206 and 208. All other entries are from U.S. Department of Agriculture, Food and Nutrition Service, Program Reporting Staff.
Symbols: a, zero; b, less than 1 million [c], estimated to be the same as the nearest year.

The cost of food subsidies to the federal government alone is estimated to reach $4 billion by fiscal 1973 (see table 1). But for each of the subsidies a figure for the total cost to government would also have to include outlays by the state and local governments. With few exceptions, the federal government does not give the subsidy directly to the consumer. Instead, under the food-stamp program the federal government provides and redeems the stamps and under the programs providing food or meals it makes grants in cash or in food to the state governments. The responsibility for getting the subsidy to the consumer is at the state and local level.

The goals of the subsidy programs are two-fold: (1) to help farming by increasing the demand for agricultural products and using surplus items; and (2) to feed the hungry and improve nutrition, with special attention to the needs of children. It is not certain which goal has greater support. At the outset, with the inauguration of the food distribution program, it probably is safe to say that to most supporters of the legislation the benefit to the farmer was the more important aim. More recently, although the legislation continues to require the use of domestic farm products, the chief motive for the expansion of the food-stamp program and the school lunch program may well have shifted to the feeding of the poor. The proportion of the population engaged in farming has declined. At the same time the awareness of poverty has grown, the income levels defining poverty have been raised, and greater concern is expressed for the permanent damage to children resulting from poor nutrition.

This paper omits some of the most important and challenging questions regarding the subsidies. Comprehensive surveys assessing the effectiveness of the subsidies in reaching the poor and in achieving the goals of increased spending on food, improved nutrition, and higher demand for farm products would require time, staff, and facilities not available to this limited project. Neither does this paper try to ascertain total expenditures by governments on the subsidies, their division among the three levels of government, nor their macro-economic effects on income and employment. Concerned as it is with the subsidies alone, this inquiry also leaves out the broader and widely-asked current query as to whether nutrition might not be more readily improved by an attack on poverty in general than by the existing direct efforts to increase the quantity and improve the quality of food consumption.

This paper asks theoretical questions suggesting further empirical investigation. Among the specific questions to be considered are: (1) Does the granting of the subsidy lead to an equal increase in spending on food? (2) Are participants likely to be satisfied with the programs? (3) Can the subsidies fulfill their aims? and (4) Might a cash subsidy not do as well as the present subsidies-in-kind?

II. FOOD SUBSIDIES TO HOUSEHOLDS

A. The Food Stamp Program

The food-stamp program, the largest of the food subsidies, helps needy households to increase their expenditures on food to cook at home (see table 1). An early family food assistance program using stamps was in effect for almost four years from May 1939 until March

1943. It was designed to increase the demand for food and reduce farm surpluses, but by 1943 the War had brought an end to the problem of surpluses. The present program, growing from a number of pilot programs begun in 1961, operates under the Food Stamp Act of 1964 as amended.[1] The U.S. Department of Agriculture's Food and Nutrition Service (FNS) administers the program at the federal level leaving to the state public assistance agencies the certification of eligible households and the distribution of the stamps.[2] The dual aims of the food-stamp program, are to ". . . raise levels of nutrition among low-income households . . ." and "to . . . strengthen our agricultural economy . . ."[3] The program does not operate nationwide, but exists only in specified counties and cities which have made application, met the requirements and been accepted for the program.[4]

Under the Food Stamp Program, eligible low-income households are permitted to buy stamps freely exchangeable for domestic food products in authorized grocery stores. The consumer pays less for the stamps than their face value, the difference being the amount of the subsidy in free stamps. The key features in the operation of the present program are the eligibility requirements for the household, the value of food stamps allotted to the household, and the amount paid by the household for the stamps.

ELIGIBILITY

To be eligible a household must meet a number of tests regarding location, facilities for using the food, willingness to work, and need demonstrated by low income and few resources.[5] The household must be located in a county or city designated as a project area in the program.[6] By July, 1972, the first month of the fiscal year 1973, there were 2,150 project areas.[7] An eligible household must have kitchen facilities, and the members must buy their food together.[8] The only exception to the requirement of a kitchen is the household consisting of an elderly single person or couple which can use its stamps to buy prepared meals—meals on wheels—delivered to the home by certain nonprofit organizations.[9]

Registration for employment demonstrates the required willingness to work. Every member of the household between 18 and 65 years of age and able to work must register unless already working at least 30 hours per week, attending school at least half-time or needed at home to care for children or invalids.[10] For the criterion of need, those households in which all members receive public assistance are automatically certified as eligible for food stamps. Other households must pass the needs requirement that their income and their assets do not exceed certain limits. In July 1972, 61 percent of the 12 million persons participating in the Food Stamp Program were also recipients of public assistance.[11] The Secretary of Agriculture establishes uniform

[1] Public Law 88–525, 78 Stat. 703, approved Aug. 31, 1964, as amended (7 U.S.C. 2011–2025).
[2] 7 CFR 270.3.
[3] 7 CFR 270.1(a) ; P.L. 88–525, 78 Stat. 703, Sec. 2.
[4] 7 CFR 270.2(oo).
[5] The details of the requirements are found in 7 CFR 271.3.
[6] 7 CFR 270.2(t).
[7] FNS, Program Reporting Staff, Aug. 31, 1972.
[8] 7 CFR 271.3(a)(2).
[9] 7 CFR 270.2(jj).
[10] 7 CFR 271.3(e).
[11] FNS, Program Reporting Staff, Aug. 31, 1972.

national standards of eligibility for income and resources applicable in all states except Hawaii and Alaska where higher standards apply. According to the uniform national standards [12] effective July 1, 1972, the maximum monthly income for eligibility varies only with the size of the household, ranging from $178 a month for a one-person to $640 for an eight-person household with an increment of $53 for each additional person beyond eight (table 2).

TABLE 2.—MAXIMUM[1] ALLOWABLE MONTHLY INCOME STANDARDS AND MONTHLY COUPON ALLOTMENTS BY HOUSEHOLD SIZE, 48 STATES AND DISTRICT OF COLUMBIA, EFFECTIVE JULY 1, 1972

Household size	Maximum monthly income	Monthly coupon allotment
1	$178	$36
2	233	64
3	307	92
4	373	112
5	440	132
6	507	152
7	573	172
8	640	192
Each added member	+53	+16

[1] A State may use its standards in effect before July 29, 1971, if they were higher.

Source: "Food Stamp Program," FSP No. 1972-1, U.S. Department of Agriculture, Food and Nutrition Service, Apr. 13, 1972.

Besides a home and its furnishings, a car, personal effects, life insurance, and income-producing property, the resources of an eligible family cannot exceed $1,500. This ceiling is raised to $3,000 in the case of a household of two or more where one member is 60 or over.[13] While appearing reasonably defined, the determination of eligibility often attracts public criticism, especially when the recipients of stamps own a conspicuous car, an expensive coat, attend college, receive relatively high income during a part of the year, or do not find work.

ALLOTMENT OF STAMPS

Like the maximum eligible income, the coupon allotment—the value of food stamps a household is permitted to buy each month—varies only with the number of persons in the household without regard to their ages or activities. The Department of Agriculture sets the amount as the minimum expenditure on food for an economy budget designed to give adequate nourishment to a family of given size.[14] As of July 1, 1972, in 48 states and the District of Columbia the allotment ranged from $36 for a one-person household to $192 a month for an eight-person household increasing by $16 for each additional person beyond eight (see tables 2 and 3). (Coupon allotments for Alaska and Hawaii were larger.) Allowing the same amount of free stamps to every household of the same size and income favors those households whose members require less food; for example, households with workers in sedentary jobs, small children, and elderly persons.

[12] 7 CFR 271.3(C)(3).
[13] 7 CFR 271.3(c)(4).
[14] "Food Stamp Act—Amendments," Pub. Law 91-671, 84 Stat. 2048, Sec. 5a; 7 CFR 270.2(o) and 270.1(a).

TABLE 3.—MONTHLY COUPON ALLOTMENTS AND PURCHASE REQUIREMENTS BY SELECTED BRACKETS OF MONTHLY NET INCOME[1] AND SIZE OF HOUSEHOLD, 48 STATES AND DISTRICT OF COLUMBIA, JULY 1, 1972

	Number of persons in household							
	1	2	3	4	5	6	7	8
	Monthly coupon allotment							
	$36	$64	$92	$112	$132	$152	$172	$192
Monthly net income	Monthly purchase requirements							
$30 to $39.99	$4	$4	$4	$4	$5	$5	$5	$5
$100 to $109.99	18	23	24	25	26	27	28	29
$170 to $189.99	26	42	46	47	48	49	50	51
$230 to $249.99		44	64	65	66	67	68	69
$290 to $309.99			74	82	84	85	86	87
$360 to $389.99				88	98	104	107	108
$420 to $449.99					104	112	122	126
$480 to $509.99						120	130	134
$570 to $599.99							136	146
$630 to $659.99								152

[1] The last entry for each size of household corresponds to the maximum allowable monthly income.

Source: Food and Nutrition Service, U.S. Department of Agriculture, Food Stamp Program, FSP No. 1972-1, "Monthly Coupon Allotments and Purchase Requirements—48 States and District of Columbia," Apr. 13, 1972.

Since 1970, the household is not required to buy its entire allotment each month, but instead can choose to buy only one-fourth, one-half, or three-fourths of the allotment at a time with purchases being permitted but not required every two weeks.[15] Allowing the purchase of fractional parts of the allotment at bi-weekly intervals is designed to ease the burden on households short of cash and attract into the program other households wanting less food than the full allotment requires.

WHAT THE HOUSEHOLD PAYS

The purchase requirement is the amount charged the household for the full coupon allotment and is intended to equal the normal expenditure for food by households of the same size and income.[16] Its amount increases not only with the size of the household but also with its monthly income (see table 3). For example: A family of four with a monthly coupon allotment of $112 will receive its allotment free, if its monthly income is under $30, and will pay a sum ranging from $4 if its income is in the range $30-$39.99 up to $88 if its income is in the range $360-$389.99; and a family of 8 with a monthly coupon allotment of $192 will also receive its allotment free, if its monthly income is under $30, but will pay $5 in the income range $30-$39.99, $108 in the range $360-$389.99, up to $152 in the range $630-$659.99. Under no circumstances is the household charged more than 30 percent of its income.[17]

The importance of the purchase requirement to a household is twofold: First, it determines the size of the cash sum which the household must pay at one time in order to participate in the program; and, second, it is the independent variable in the equation determin-

[15] "Food Stamp Act—Amendments," Pub. Law 91-671, 84 Stat. 2048, Sec. 5(b) ; 7 CFR 271.6(d)(3).
[16] "Food Stamp Act of 1964," Pub. Law 88-525, 78 Stat. 703, Sec. 7(b) ; 7 CFR 270.2(pp).
[17] "Food Stamp Act—Amendments," Pub. Law 91-671, 84 Stat. 2048, Sec. 5(b).

TABLE 4.—MAXIMUM FREE STAMPS PER MONTH BY SELECTED BRACKETS OF MONTHLY NET INCOME[1] AND SIZE OF HOUSEHOLD, 48 STATES AND DISTRICT OF COLUMBIA, JULY 1, 1972

Monthly net income	Number of persons in Household							
	1	2	3	4	5	6	7	8
$30 to $39.99	$32	$60	$88	$108	$127	$147	$167	$187
$100 to 109.99	18	41	68	87	106	125	144	163
$170 to $189.99	10	22	46	65	84	103	122	141
$230 to $249.99		20	28	47	66	85	104	123
$290 to $309.99			18	30	48	67	86	105
$360 to $389.99				24	34	48	65	84
$420 to $449.99					28	40	50	66
$480 to $509.99						32	42	58
$570 to $599.99							36	46
$630 to $659.99								40

[1] The last entry for each size of household corresponds to the maximum allowable monthly income.

Source: Calculated as the monthly coupon allotment less the monthly purchase requirement given in table 3.

ing the value in free stamps awarded to each size of household (*i.e.*, free stamps equal coupon allotment minus purchase requirement). Since 1970, an amendment to the Act permits a household to reduce its payments by buying as little as one-fourth of the allotment once a month or at two-week intervals.[18]

The subsidy consists in the sale of the stamps at less than their face value and varies with both income and household size. Whether measured as a) the total value of free stamps per household (table 4), b) the gain to the household with each dollar of food stamps bought (calculate from data in table 5), or c) the value of free stamps given for each dollar paid by a household (table 6), the subsidy increases with the increasing size of the household and decreases with increasing incomes. For any given size of household, the purchase requirement is arranged to increase with income while the value of the stamps bought remains unchanged, with the result that the price of a dollar's worth of food stamps rises as income rises (see table 5). For any given income, as the size of the household increases the purchase requirement rises less rapidly than the coupon allotment, with the result that the price of a dollar's worth of stamps is less for large households than for small.

TABLE 5.—PRICE OF A DOLLAR IN FOOD STAMPS BY SELECTED BRACKETS[1] OF MONTHLY NET INCOME AND SIZE OF HOUSEHOLD, 48 STATES AND DISTRICT OF COLUMBIA, JULY 1, 1972

Monthly net income	Number of persons in household							
	1	2	3	4	5	6	7	8
$30 to $39.99	$0.11	$0.06	$0.04	$0.04	$0.03	$0.03	$0.03	$0.03
$100 to $109.99	.50	.36	.26	.22	.20	.18	.16	.15
$170 to $189.99	.72	.66	.50	.42	.36	.32	.29	.27
$230 to $249.99		.69	.70	.58	.50	.44	.40	.36
$290 to $309.99			.80	.73	.64	.56	.50	.45
$360 to $389.99				.79	.74	.68	.62	.56
$420 to $449.99					.79	.74	.71	.66
$480 to $509.99						.79	.76	.70
$570 to $599.99							.79	.76
$630 to $659.99								.79

[1] The last entry for each size of household corresponds to the maximum allowable monthly income.

Source: The prices were calculated as the quotient of the purchase requirement and the coupon allotment given in table 3.

18 P.L. 91–671 ; 84 Stat. 2048, Sec. 5b ; 7 CFR 271.6(d)(3).

TABLE 6.—FREE STAMPS PER DOLLAR OF PURCHASE REQUIREMENT BY SELECTED BRACKETS OF MONTHLY NET INCOME [1] AND SIZE OF HOUSEHOLD, 48 STATES AND DISTRICT OF COLUMBIA, JULY 1, 1972

Monthly net income	Number of persons in household							
	1	2	3	4	5	6	7	8
$30 to $39.99	$8.00	$15.00	$22.00	$27.00	$25.40	$29.40	$33.40	$37.40
$100 to $109.99	1.00	1.78	2.83	3.48	4.07	4.63	5.14	5.62
$170 to $189.99	.38	.52	1.00	1.38	1.75	2.10	2.44	2.76
$230 to $249.99		.45	.44	.72	1.00	1.27	1.53	1.78
$290 to $309.99			.24	.37	.57	.79	1.00	1.21
$360 to $389.99				.27	.35	.46	.61	.78
$420 to $449.99					.27	.36	.41	.52
$480 to $509.99						.27	.32	.49
$570 to $599.99							.26	.32
$630 to $659.99								.26

[1] The last entry for each size of household corresponds to the maximum allowable monthly income.

Source: Calculated as the quotient of free stamps (table 4) and monthly purchase requirements (table 3).

STATISTICS

The year by year growth of the Food Stamp Program since its establishment in 1964 is the salient feature of the statistics of participation and coupon issuance (see table 7). The numbers of persons participating rose from 360 thousand in June of Fiscal 1964 to almost 12 million in June 1972, and the number of counties and other political units having projects rose from 43 to 2,130. Over the same period, the total of all stamps issued went up from a monthly value of $6 million to $292 million of which the amount of the subsidy in free stamps increased by an even greater percentage from $2 million to $158 million. The yearly totals of stamps issued rose from $73 million in Fiscal 1964 to $3.3 billion in Fiscal 1972, and the free stamps from $29 million to $1.8 billion.[19]

TABLE 7.—FOOD STAMP PROGRAM: NUMBER OF PROJECTS AND PARTICIPANTS; MONTHLY VALUE OF COUPONS ISSUED AND PER PERSON BONUS, MONTH OF JUNE, 1964-72

End of fiscal year	Number of projects	Persons participating (thousands)	Coupons issued (millions of dollars)		Average bonus per person (dollars)
			Total	Bonus	
June:					
1972	2,130	11,672	291.8	157.6	13.50
1971	2,027	10,518	258.8	140.9	13.40
1970	1,747	6,457	154.1	91.6	14.19
1969	1,489	3,222	57.6	21.6	6.70
1968	1,027	2,420	41.2	15.4	6.35
1967	838	1,832	31.1	11.0	6.03
1966	324	1,218	20.6	7.4	6.07
1965	110	633	10.6	4.0	6.30
1964	43	360	6.0	2.3	6.43

Source: U.S. Department of Agriculture, Food and Nutrition Service.

Not only did the total free stamps issued increase, but also the value of free stamps per person participating increased from $6.43 to $13.50. But unlike the totals, the free stamps per person did not rise each year, but held at a level between $6 and $7 from 1964 through 1969 then took an abrupt turn upward from $6.70 to $14.19 during 1970. Over the same twelve-month period, the number of participants doubled. In December 1969, the Secretary of Agriculture announced a reduction in the

[19] U.S. Department of Agriculture, Food and Nutrition Service.

payments required of participants and an increase in coupon allotments, thereby raising the average amount of free stamps per participant.[20] The marked jump in the per capita bonus from June 1969 to June 1970 was due decidedly more to the increase in the per capita coupon allotment than to the decrease in the per capita purchase requirement. The 112 percent rise in the per capita value of the free stamps accompanied a 34 percent increase in the per capita coupon allotment and a 13 percent decrease in the per capita purchase requirement.[21]

A number of changes in the Food Stamp law account for much of the expansion of the program. Increased appropriations have made possible its expansion into more counties and cities; a program of education and publicity has spread knowledge about the program; and the easing of the charges for participation combined with the increase of the reward in free stamps has drawn more households into the program. Appropriations for the Food Stamp Program rose from $75 million and $100 million in its first two fiscal years, 1965 and 1966, to $2.2 billion for fiscal 1972 and $2.5 billion for fiscal 1973.[22] The Department of Agriculture with state and local cooperation has encouraged every county and independent city to adopt either a food stamp or food distribution program.[23] Since 1969, the Federal Extension Service has expanded its "outreach" program of education including instruction for families on how to participate in one of the food programs.[24] The program has grown more attractive as a result of both the increase in the coupon allotment and the decrease in the purchase requirement. The total cash payments by participants as a percentage of the total coupons issued fell from 62 percent in the fiscal year 1969 to 44 percent by the fiscal year 1972.[25]

As seen above, the participant no longer is required to buy the whole allotment each month, but may buy as little as one-fourth of it biweekly.[26] The real value of the allotment is to be maintained by an annual adjustment ". . . to reflect changes in the prices of food published by the Bureau of Labor Statistics . . ."[27] The purchase re-

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[20] "Amendments to the Food Stamp Act of 1964," H.R. 91st Cong., 2d Session, Report No. 91–1402, pp. 5–6.
[21] Per capita values and relatives calculated from the data in table 7 follow:

	Coupon allotment	Purchase requirement	Free stamps
Per capita values:			
June 1969	$17.88	$11.18	$6.70
June 1970	$23.87	$9.68	$14.19
Relatives:			
June 1969	100.0	100.0	100.0
June 1970	133.5	86.6	211.8

[22] Food Stamp Act of 1964, P.L. 88–525, Sec. 16(a) ; *Appendix to the Budget for the Fiscal Year 1973*, p. 204 ; and . . . *Appendix* . . . 1974, p. 207.
[23] "Amendments to the Food Stamp Act of 1964," H.R. 91st Cong., 2d Session, Report No. 91–1402, p. 7.
[24] "Food Stamp Act—Amendments," P.L. 91–671 84, Stat. 2048, Approved Jan. 11, 1971, Sec. 6(b) ; 7 CFR 270.2(mm) and 271.1(k).
[25] In fiscal 1969 total payments by participants were $374.5 million and total coupons were $603.2 million and in fiscal 1972 $1,513.0 million and $3,306.3 million (The Budget * * * Appendix, p. 205.
[26] "Food Stamp Act—Amendments," P.L. 91–671, 84 Stat. 2048, Sec. 5(b) ; 7 CFR 271.6(d)(3).
[27] "Food Stamp Act—Amendments," *op. cit.*, Sec. 5(a) ; and 7 U.S.C. 2016(a) ; in E. R. Fried, A. M. Rivlin, C. L. Schultze, and N. H. Teeters, *Setting National Priorities: The 1974 Budget* (Washington: The Brookings Institution. 1973). p. 109 the suggestion is made that this rule of changing the value of stamps with food prices be followed ". . . rather than with increases in the general cost of living, as is now the case."

quirements have been reduced for all participants and even eliminated for households of one or two persons having monthly incomes below 20 dollars and for larger households below 30 dollars, making more families able to afford the program.[28]

EFFECTS ON THE HOUSEHOLD

A full evaluation of the food-stamp program requires detailed information as to its effects on consumer satisfaction, spending, and incentives to work; on the economy in general; and on agriculture in particular. Such a factual analysis would call for statistical surveys beyond the scope of this paper. Instead, the analysis here is theoretical, offering only tentative conclusions for possible testing by survey and some recommendations for consideration.

Satisfaction and spending

The following analysis assumes that the consumer will get the most satisfaction from spending his income if the last dollar spent on food gives him the same satisfaction as the last dollar spent on non-food items. Two questions are asked: (1) Does the food-stamp program distort the balance of satisfaction between marginal spending on food and non-food items so that the consumer finds himself wishing that he had spent less on one group of items and more on the other group of items? and (2) What action is open to the consumer to restore the balance?

The effects of the food-stamp program are examined below according to the amount of food expenditures of the household in relation to the stamp allotment, income, and the corresponding level of purchase requirement. The Appendix contains an additional graphical interpretation. Three types of households are distinguished.

Type 1. The household with income in excess of the coupon allotment for that size of household and with plans to spend on food as much or more than the amount of the coupon allotment. Before entering the program, this household through economizing on non-food purchases is spending enough for a minimum adequate diet. It sees the subsidy paid in stamps as equivalent to a cash subsidy. It can buy at least a part of its intended food purchases with the stamps, releasing cash equivalent to the amount of its free stamps for additional expenditures. Under the food-stamp program this household can maintain the exact amount of its intended purchases of food and of other items, and in addition have extra cash equal to the amount of free stamps. Since its pattern of intended expenditures has not been altered, the household can be expected to spend its additional cash on both increased purchases of food and increased purchases of other items. It is unlikely to spend the entire subsidy on additional food as the food-stamp program intends. The freedom to spend the entire subsidy as it pleases saves this household from any temptation to cheat by converting stamps or food into cash. Its free stamps are already the same as cash.

Type 2. The household planning before the program, to spend on food an amount between that of the purchase requirement and the stamp allotment. Only a part of this household's free stamps has the effect of increasing its cash income. The program requires of this household a cash payment no larger than its intended food purchase. The household will pay for any excess of its intended food purchase over the purchase requirement with a part of its free stamps. This substitution of free stamps for cash to pay for a portion of its intended food purchases will release an equal amount of cash to be spent as the household chooses. But they must spend the remainder of their free stamps to buy the extra food required to raise their purchases to the coupon allotment provided for this size of household. The distinction between the first type and this second type of household is that the latter must spend more on food than it had intended so that only a part of its free stamps has the effect of a cash subsidy.

As the Type-2 household contemplates its increased stock of food and considers how to spend the cash released by the use of stamps, the first dollars of its additional cash will be seen to bring more satisfaction if spent on non-food items than if spent on food. After spending a part of its extra cash on non-food items, some households in this category may then return to spend even more on food than was required by the coupon allotment. For these households spending more on food than is required, the freedom to divide the released cash between food and non-food items will leave them satisfied with no temptation to cheat through the conversion of stamps or food into cash.

But, other households in this category, even after spending all their released cash on non-food items, will wish they had still more cash for non-food items and less food than that required by the allotment. The extreme of this latter group of dissatisfied households is the one at the lower limit of the Type-2 category, planning to spend for food exactly the amount of the purchase requirement. It will be able to buy just enough food to use the coupon allotment set for its size and at the same time continue to spend its planned amount of cash on non-food items. It enjoys no cash released for free expenditure. While this household will be better off under the stamp program than before, it will not be satisfied with the combination of the increased amount of food and only the same amount of non-food as planned before the receipt of the stamps.

Such a Type-2 household dissatisfied with the pattern of food and non-food spending forced upon it may be able to increase its satisfaction in one of two ways: First, by buying some luxury foods not previously possible on its small food budget; and, second, by the illegal sale of some of its stamps or stock of food. Neither of these attempts by households to escape dissatisfaction conforms with the purpose of the program. While the first is legal, more expensive food does not guarantee improved nutrition. The second is both illegal and a diversion of the subsidy away from its intended use to improve the nutrition of each participating household.

Type 3. The household planning to spend less for food than the amount of the purchase requirement. This household plans to spend less on food than the average for its size and income class. The food-stamp program will affect it in the same way it affects the dissatisfied

Type-2 household, but the effect will be more severe. The greater dissatisfaction of this household arises not only from being required to spend more on food than planned, but also from having even less money than planned to spend on non-food items. The added distortion results from this household's having to reduce its planned expenditure on non-food items in order to get enough cash to meet the purchase requirement. Thus this household actually suffers what might be considered a negative cash subsidy or what appears as a penalty on the purchase of non-food items. This third type of participating household will be faced with the strongest temptation to get cash illegally from some of its stamps.

To sum up the effects on household satisfaction and spending: Contrary to the food-stamp program's stated purpose of improving nutrition, all participating households do not have to spend their entire subsidy of free stamps on food. Some do not even have to increase their food expenditures at all. Those households accustomed to spending an amount on food as great as the value of the coupon allotment find the free stamps equivalent to cash, permitting them exactly the same additional expenditures as would a cash subsidy. A second group of households (Type 2 and 3) have been accustomed to spending less than the coupon allotment.

Within this group, some Type-2 households receive enough released cash to increase their non-food expenditures sufficiently to leave them satisfied with the apportionment of their expenditures between food and non-food items. All the rest of the Type-2 households and all the Type-3 households find that by requiring an increase in their food expenditures the program distorts their desired allocation of expenditures between food and non-food items.[29] These dissatisfied households are expected to accept an unwanted pattern of expenditures in exchange for the free stamps. They are allowed to make the required expenditure on food more attractive by the purchase of more expensive, but not necessarily more nutritious foods. At the same time, opportunities are available for evasion through the illegal conversion of food stamps into cash. To this latter group of participating households, the program presents a choice between the competing evils of an unwanted allocation of funds and an illegal corrective action.

Incentive to work

Prior to the 1971 requirement of work registration, the inverse relationship between income and the amount of free stamps to some degree must have discouraged the recipient of stamps from looking for work. In general (consistent with rounding to whole dollars), the tables of income, purchase requirements, and coupon allotments provide a decrease of two dollars in free stamps for a one-person household and three dollars in free stamps for all other household sizes with each increase of ten dollars in monthly income. Thus a recipient of food stamps must expect to lose approximately 30 cents of free food stamps for every added dollar of net income. This reduction in food stamps is equivalent to a 30 percent marginal rate of income tax exacted through a decrease in the amount of free food stamps.

[29] In her analysis of the food-stamp program, Judith A. Segal argues that the lack of choice open to the poor in spending makes it futile to try to dictate exact expenditures on food. She writes: "* * * It is necessary to sacrifice some of the program's efficiency to increase food consumption in return for increasing its ability to eliminate some of the elements of poverty, whether or not they are related to food consumption." *Food for the Hungry: The Reluctant Society* (Baltimore and London: The Johns Hopkins University Press, 1970), p. 74.

The disincentive to earn inherent in the food-stamp program differs according to whether or not the participants also receive public assistance. Almost two-thirds of the participants in the food-stamp program receive welfare payments, which are reduced by an increase in a household's net earnings.[30] This disincentive to work generated by the public assistance program alone is outside the limits of this paper. But in combination with the food-stamp program the public assistance program offsets, at least partially, the impact of added net earnings on the amount of the subsidy in free stamps. The food-stamp program is related to public assistance by the inclusion of welfare payments in the income figure used to determine the purchase requirement and the resulting receipt of free stamps.[31] The effective relationship between the two programs flows in one direction only—from the public assistance to the food-stamp program and not in the reverse direction. Since the value of the free stamps is not considered a part of income in determining the size of welfare payments, the reduction in the amount of free stamps accompanying an increase in earnings has no effect on public assistance.[32]

In the reverse direction, however, a reduction in the welfare payment following an increase in earnings keeps the income figure used in the food-stamp program from rising by the full amount of the increase in net earnings and, thereby, keeps the recipients of public assistance from losing as many free stamps as do participants in the food-stamp program not getting public asistance. Thus the food-stamp program offers some discouragement to work to all its participants whether or not they are on public assistance, the disincentive being greater for those not receiving public assistance.

In 1971, a marked change occurred in the effect of the program on the incentive to work when an amendment to the Food Stamp Act of 1964 introduced registration for appropriate work as one of the eligibility requirements for food stamps of those considered able to work.[33] This provision more than counteracts the disincentive to work inherent in the original food-stamp plan. Where before the Amendment, the food-stamp plan discouraged the seeking of work by reducing its net reward, the Amendment has substituted an incentive to seek work. The work incentive comparing the return in wages with the loss in subsidy is no longer a comparison at the margin, but is a comparison of totals.

By exacting a penalty amounting to the loss of the entire food-stamp subsidy for all members of the household unless those defined as able to work register for work, the amended Act presents a participant with the explicit choice between applying for work with some reductions in food stamps and not applying and receiving no food stamps at all. A food-stamp recipient who formerly might have wavered between the choice of no work and of work with higher net earnings but fewer stamps probably now will choose to register for work rather than lose all the household's stamps.

[30] See above, p. 1069.
[31] 7 CFR 271.3(e)(1)(g) : for a discussion of the interaction in New York City of public assistance, food stamps, school lunches, and medical assistance, see Blanche Bernstein with Anne N. Shkuda and Eveline M. Burns. *Income-Tested Social Benefits in New York: Adequacy, Incentives, and Equity,* Paper No. 8, Studies in Public Welfare, Subcommittee on Fiscal Policy of the Joint Economic Committee. Congress of the United States (Washington : U.S. Government Printing Office), pp. 12, 140–6, and 148–51.
[32] 7 CFR 271.1(b).
[33] See above, p. 9. "Food Stamp Act—Amendments," Public Law 91–671 ; 84 Stat. 2048, Jan. 11, 1971, Sec. 4 ; 7 CFR 271. 3(e).

Discouragement to participation

While the success of the food-stamp program must be judged in part on how the participating households spend their free stamps, it depends basically on the extent of participation by eligible households. Unfortunately from the start the attractiveness of the subsidy has been reduced and for some households offset entirely by the costs and inconveniences of the program. Recent measures designed to expand the program have changed some of the program's discouraging features.

Participation in the program sometimes has money costs. Trips to apply for the program, to buy the stamps, and to reach the nearest participating grocery store when none is in the neighborhood may involve payments for transportation, for companions to accompany the handicapped, and for persons to look after dependents left at home.

Besides the extra money costs of the program, the purchase requirement ties up in food stamps a larger sum than most eligible families are accustomed to hold in a stock of groceries. Low-income families have many demands on their limited funds and often place such a premium on cash that they are reluctant or even unable to pay out at one time the cash sum needed to buy the stamps. Evidence of the guarding of cash is the marked drop in the number of participants noted where the food-stamp program was substituted for an existing food distribution program, which had not required a payment from the household.[34]

Two measures have been taken designed to relieve this drawback to participation. The first permits households receiving public assistance to request that the payment for their full monthly food-stamp allotment be withheld regularly from their welfare payment, thus assuring that the money for the purchase requirement will not be spent for anything else.[35] Under the second, a participant not having his purchase requirement withheld may buy as little as a fourth of the coupon allotment or may buy the whole allotment in installments.[36] In this way, households unwilling to buy the whole stamp allotment may be willing to enter the program when they have to buy only a part of it. But the fractional purchase of stamps does not work exclusively towards its goal of expanding the program. It may also contract the program by reducing the amount of food stamps bought by some households already in the program.

Fractional purchase meets in part one of the strongest objections to the program—that the use of food stamps forces many households to spend more on food than they would choose to spend with a cash subsidy. The election to buy a fraction instead of all the allotment allows more flexibility to the rational consumer to divide his expenditures between food and non-food items. Each successive fourth of the monthly food allotment may be expected to bring less satisfaction than the preceding one, while costing the consumer the same reduced price. (The reduced price is the same percentage of the market price as the purchase requirement is of the coupon allotment. See table 5.)

[34] Dale M. Hoover and James G. Maddox, *Food for the Hungry: Direct Distribution and Food Stamp Programs for Low-Income Families*, Planning Pamphlet No. 126 (Washington, D.C.: National Planning Association, 1969), p. 7; see also Segal, *op cit.*, p. 58.

[35] 7 CFR 271.6 (d) (2).

[36] See above, pp. 1071 and 1072; Pub. Law 91–671, 84 Stat. 2048, Sec. 5(b); 7 CFR 271.6 (d)(3).

The comparison between declining satisfaction and constant price may cause the consumer to stop short of buying the full coupon allotment, even at a bargain price. Although the consumer cannot maximize his satisfaction as he might with a cash subsidy, some households will find more satisfaction in buying a part rather than the whole of the food stamp allotment.

Besides the money costs of participation, the food-stamp program exacts psychic costs. In spite of consideration shown by the personnel in charge of the program, the certification of the non-public-assistance household burdens the applicant with personal costs, including: the time spent in waiting, being interviewed, and filling out forms; the unpleasantness of crowded waiting rooms; the sensitiveness to a means test; and the revealing of private data.

But perhaps the key element in the program—the stamps themselves—pose the greatest obstacle to a person considering participation in the program.[37] By requiring the use of stamps instead of money, the food-stamp program publicly identifies the recipient of the subsidy at the time he buys his food—probably his largest and most conspicuous purchase. For large numbers of housewives the grocery is a center where neighbors meet. There is no privacy at the check-out counter. Many sensitive persons must refuse to enter the program rather than suffer the embarrassment of being forced to pay with stamps and thereby reveal their financial difficulties before people they know. The program, as well as the recipient, suffers from the use of the stamps in public. Other persons buying in the grocery, especially non-participants in the program, will note examples of extravagance or poor judgment in the choice of groceries bought with stamps and base their condemnation of the entire program of family food subsidies on what may be only occasional indiscretions in buying.

The same amendment to the food-stamp act that persuades some to register for work as a requirement for the household's eligibility to receive stamps must also discourage some other persons from participating in the program. It may be assumed that an unemployed person not already registered for work must regard such registration as undesirable. Unless the household's total subsidy in free food stamps (see table 4) is sufficient to offset the disutilities associated with the addition of work registration to the costs and other inconveniences of participation, an otherwise eligible person will not register for work in order to enter the program.

If all households had equal costs and attached the same values to their inconveniences, then the high income and small households paying the highest price per food stamp would be the most readily discouraged (see table 5). But both the subsidy in free stamps and the costs associated with it vary widely among households. The positive feature of the program—total free stamps available—is determined by only two variables, income and size of household (see table 4). What each household sees as negative features—costs and inconveniences—depend on many other characteristics of the household besides income and size, such as: The ages of the members; whether there are members able to work, not already registered for work; whether there are members not required to register for work, but able to attend to the application for certification and buying the stamps; distance of the residence

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[37] Cf. Segal, *op. cit.*, p. 39.

from the food-stamp office and participating grocery stores; the composition of the neighborhood and the household's position in it; the household's attitude toward privacy and its sensitivity to criticism; the household's existing financial commitments such as rent and installment payments;[38] and whether members of the household already receive public assistance. The immense variety of household conditions prevents generalizations about the success or failure of the program in attracting eligible households.

Available statistics show the number of participants, but not the number of those eligible who refrain from entering the program. The number of households eligible for stamps and not receiving public assistance is unknown, and consequently the percentage of all eligible households participating in the food-stamp program is also unknown. Writing in the late 1960's, Judith A. Segal estimated ". . . an average participation rate in the food stamp program of 25 percent or less." [39] But since then the success of recent efforts to combat the program's discouraging features and expand the program is shown by the increase from June 1969 to June 1972 in participants from 3.2 to 11.7 million or an increase of 266 percent, in the total monthly payment for stamps from $36 million to $134 million or an increase of 272 percent, and in the total monthly receipt of free stamps from $22 million to $158 million or an increase of 618 percent.[40]

EFFECT ON THE ECONOMY

The total results of the food stamp program will vary with the source of funds and the changes effected in the distribution of income among households and among regions. But an examination of the macroeconomic effects is beyond the limits of this paper.

It should be noted, however, that if the analysis abstracts from the source of the federal funds and the effects on income distribution, the food stamp program can be expected to stimulate production, sales, and employment within the county. Spillovers beyond the county line will result from a growth of imports from outside the county. The initial increase in spending on food will fall between two extremes— the one where the entire amount of the subsidy in free stamps is spent to increase customary food expenditures and the other where all the free stamps replace funds normally spent on food. The former limit accords with the goals of the program to increase food consumption, while the latter limit describes the situation which would exist if the subsidy were paid in cash rather than in food stamps. Whether or not the initial benefits go to agriculture will depend on how the food subsidy affects consumer spending. But it will have a multiplier effect on the economy whether it is spent to increase food purchases or to release cash to be spent as the consumer wishes. The size of the multiplier will vary with the interrelationships among the sectors affected by the added spending.[41]

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[38] Segal, *op. cit.*, p. 35.
[39] *Op. cit.*, p. 58.
[40] Calculated from data from the U.S. Department of Agriculture, Food and Nutrition Service.
[41] For an analysis of the effects in three counties, see Masao Matsumoto, *Impact of the Food Stamp Program on Three Local Economies: An Input-Output Analysis* (Washington: U.S. Department of Agriculture, Economic Research Services, May, 1972).

B. Food Distribution

The food distribution program, until recently called "commodity distribution," is the oldest of the federal consumer food subsidies. Begun in 1935, it was designed to serve the two-fold purpose of using surplus agricultural products and feeding the needy.

The recipients of the distributed food fall into three major categories: Children, persons in institutions, and needy persons living in households (see table 1). The last of these groups, the needy in households, is the subject of this section; food distribution under the child feeding programs is taken up in Section III.

Food distribution is authorized by three sections of the law referred to as Sections 6, 32, and 416. Section 6 of the National School Lunch Act of 1946, as amended, provides for the purchase and distribution of foods for the schools by the federal government.[42] Section 32 of the Public Law 320, August 24, 1935, as amended authorizes the use of 30 percent of gross customs receipts for the acquisition of commodities.[43] Section 416 of the Agricultural Act of 1949 provides for the processing, handling, and transportation of surplus commodities distributed to the state agencies.[44] All three sections provide food for school children. Only the Sections 32 and 416 authorize the distribution of food to needy persons living in households.

The cost to the federal government of the subsidy for food distribution to the needy ranks second to food stamps among the food subsidies to households (see table 1). With the expansion of the food-stamp program, the older food distribution program has shown a relative decline both as a cost to the federal government and in the number of participants (cf. tables 7 and 9). The part of this paper devoted to food distribution is briefer than that devoted to food stamps because of the food distribution program's declining importance and relatively uncomplicated structure.

The food distribution program distributes a monthly package of food, uniform for households of the same size in a given project area but varying somewhat among regions to suit local cultural tastes. The foods are canned or dried. The assortment includes vegetables, fruits, juices, meat, poultry, eggs, cereals, macaroni, syrup, butter and cheese. The Department of Agriculture estimated the per person weight and federal cost of a typical package of donated food for one month as of June 1, 1970 as 38 pounds and $9.12.[45] Meat and milk made up 44 percent of the total cost to the federal government of the package of food.[46]

ELIGIBILITY

The standards for the certification of households for food distribution vary among the states and require the approval of the Department of Agriculture.[47] The eligibility criteria are designed to guarantee that the recipients need the food and can use it. The members of a household must live outside institutions and have kitchen facili-

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[42] 42 U.S.C. 1751–1760.
[43] 7 U.S.C. 612c ; 7 CFR 250.1 (a)(3).
[44] 7 U.S.C. 1431 ; 7 CFR 250.1 (a)(1).
[45] On a per person basis for a family of four. U.S. Department of Agriculture, Food and Nutrition Service.
[46] During the fiscal year 1973 the Department of Agriculture announced that it would stop buying luncheon meats for distribution because of the high prices.
[47] 7 CFR 250.9(a).

ties.[48] The state agency cannot operate permanently both a food distribution and a food-stamp program in the same project area. On a temporary basis, both programs may exist simultaneously during the transition from a food distribution to a food-stamp program or in a food-stamp area named as a disaster area.[49]

When a natural disaster prevents low-income households from buying sufficient food, the President may declare the area to be a disaster area in which surplus foods are to be distributed to needy persons.[50] In the fiscal year 1971, out of the approximately 4.4 million needy persons receiving federally donated foods, 247,000 in 15 states and Puerto Rico were under a program of disaster relief following floods; tornadoes; hurricanes; earthquakes; severe rain, wind, or freeze; or civil disorder. They received 4 million pounds of food at a cost of $1 million to the federal government.[51]

TABLE 8.—MONTHLY CASH BENEFITS PER PARTICIPANT, FOOD STAMP AND FOOD DISTRIBUTION PROGRAMS, 1969-72

| | Food stamp | | Food distribution | |
Fiscal year	Annual	Monthly	Annual	Monthly
1972 [1]	$161.50	[2] $13.46	$85.76	[2] $7.15
1971	162.85	[2] 13.57	85.52	[2] 7.13
1970	[3] 126.60	10.55	[3] 73.92	6.16
1969	[3] 79.44	6.62	[3] 62.04	5.17

[1] Estimated.
[2] Calculated as 1/12 of annual cost.
[3] Calculated as 12 times the monthly figure.

Source: U.S. Department of Agriculture, Food and Nutrition Service, Program Reporting Staff, Sept. 29, 1972.

TABLE 9.—FOOD DISTRIBUTION PROGRAM, PARTICIPANTS AND FEDERAL EXPENDITURES, 1964-72

Fiscal year	Needy persons in households (in thousands) [1]	Cost of donated food distribution to needy persons (in millions)
1972	[3] 3,615	[4] $295.0
1971	3,974	321.2
1970	4,129	289.4
1969	3,817	224.9
1968	3,491	124.0
1967	3,722	101.1
1966	4,781	134.1
1965	5,842	226.9
1964	6,135	197.1

[1] Peak participation in period.
[2] Total cost to Federal Government.
[3] 57 percent of these also received public assistance.
[4] Estimated as the product of the annual cash benefit (table 8) and 3,439,783, the average number of participants.

Source: U.S. Department of Agriculture, Food and Nutrition Service, Program Reporting Staff, May 25, 1971, and July, 12, 1971.

STATISTICS

In the fiscal year 1971, 4.0 million needy persons living in households participated in the food distribution program, receiving 1.3 billion pounds of food costing the federal government $321 million.[52]

[48] 7 CFR 250.3 (f).
[49] 7 CFR 250.4 (a).
[50] Disaster Relief Act of 1969, Sec. 11 ; 7 CFR 250.1 (11).
[51] U.S. Department of Agriculture, Food and Nutrition Service.
[52] U.S. Department of Agriculture, Food and Nutrition Service; see table 9.

Since the fiscal year 1936, the number of needy persons participating in the program of food distribution to families has shown a downward trend. Participation was over 10 million in 1936, reached a high of almost 13 million in 1939, declined to less than 100 thousand during the war and postwar years, expanded through the decade of the fifties reaching a peak of over 7 million in 1962, declined again with the inauguration of the food-stamp program, and passed 4 million only once in the years from 1967 through 1972.[53] In contrast, over the same period the trend in the cost of the donated foods was upward. From $30 million in the fiscal year 1936 the federal costs fluctuated about a rising trend and in fiscal 1971 reached an all-time high of $321 million. Increasing quantities of food and, even more important, its increasing cost per pound explain the positive trend in federal expenditures on this program in the face of declining participation.

A comparison of the benefits per recipient under the two major family food programs points up an important difference between them in their average cost to the federal government. The average subsidy in free stamps exceeds the average cost to the government of the distributed food (see table 8). In the period from 1969 to 1972, the monthly cash benefit under food stamps more than doubled, rising from $6.62 to $13.46, while under food distribution the increase was only 38 percent from $5.17 to $7.15. As a result of their unequal growth, by 1972 the per person subsidy in food stamps had risen to a figure almost 90 percent above that in food distribution. But unlike the average subsidy in free stamps, the expenditure of the federal government on the food distribution program understates the value received by the participants. For example, the typical package of foods for a family of four estimated in 1970 to cost the federal government $9.12 per person per month was estimated to have a retail value per person of $16.29 or 79 percent above its cost.[54] When the value of the subsidies to the consumer is considered, the excess of the subsidy in food stamps over the subsidy in donated foods is greatly reduced. An important qualification, however, is that the retail value of the distributed foods will overstate their value to the recipient unless the assortment of foods is the same as he would have bought with that amount of cash. But even with this reservation, the data show that the federal government has been able to provide larger subsidies per dollar of its expenditure by food distribution than by food stamps.

While a food distribution program instead of a food-stamp program may cost the federal government less, state and local governments must spend more. Under both programs the state government bears the cost of certification of the households. The chief difference between them is in the cost of getting the food to the recipient. Under the food-stamp program the federal government pays the marketing costs by issuing stamps to be spent in retail grocery stores. But under the food distribution program the federal government spends less than the retail price in buying and delivering the food to the state authority and leaves the cost of distributing the food to the state and local governments.[55]

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[53] U.S. Department of Agriculture, Food and Nutrition Service; see table 9 for 1964–72.
[54] U.S. Department of Agriculture, Food and Nutrition Service.
[55] A recent Kentucky study of the two programs, addressed to comparing costs to the counties rather than benefits to the participants, advised county governments to seek to substitute the food-stamp for the food distribution program. The per recipient costs of the food distribution program in Henderson, Ohio, and Webster Counties were compared with the costs of the food-stamp program in another unnamed sample county. The food

Satisfaction and spending

As in the case of food stamps, the effect on the household's spending and satisfaction will vary according to the amount of the household's intended food purchases. For food distribution, the important comparison is between the value of the food distributed and the intended expenditure on food. On this basis, two types of households can be distinguished.

Type 1. The household which had planned to spend on food an amount equal to or greater than the value of the distributed food. The effects on this household may be the same as the effects of the food stamp program on the Type-1 household described in relation to food stamps. If the household finds the distributed food as acceptable as food of equivalent value which it might buy, then an amount of cash equal to the value of the commodities received in kind is released to be divided as the household chooses between expenditures on food and non-food items. In this situation, the subsidy in kind has the same effect on the household's spending as would a subsidy paid in cash. But the fixed content of the distributed commodities places a serious constraint on the household's freedom of choice. If the assortment of foods provided does not fit the tastes of the household, it may spend some of the cash released by the receipt of the commodities to obtain more desired food items lacking in the lot distributed. In this case, the recipient of the commodities may be tempted to try to replace the cash spent on additional food by selling the unwanted items. Except for the possible attempt to get a variety different from that of the distributed food, the effect on the household's spending is the same as that of a cash subsidy.

Type 2. The household which had planned to spend on food an amount less than the value of the distributed food. This household differs from the Type-1 household in that the subsidy in distributed foods provides it with more food than it had planned to buy. In its response to the subsidy, this household corresponds to the Type-2 household discussed under the food-stamp program. If the household finds the distributed foods an acceptable substitute for its own intended purchases, then the receipt of the subsidy in food will release all the funds which the household had planned to spend on food to be allocated as it chooses. The subsidy will be equal to the sum of a cash subsidy in the amount of intended food purchases and a subsidy in kind amounting to the excess of the value of the distributed food over intended food purchases. But, like the Type-1 household, if it prefers a different combination of foods, the Type-2 household may spend part or all of the released cash on desired food items and try illegally to sell the less-wanted commodities in order to recover the released cash.

As in the case of the Type-2 household under food stamps, by adding income in kind the subsidy increases the total satisfaction of all the recipients of distributed food, but it leaves some households dis-

satisfied with the resulting division of their consumption between food and non-food items. Upon receiving the increased food stock, each household will wish that it had more non-food and less food. Only those households having sufficient released cash to buy enough non-food items to offset the imbalance in their consumption will be satisfied. After spending all their released cash on non-food items, the other households will still wish that they had less food and more of other things. The distorted pattern of consumption is the result of a subsidy in kind instead of in cash, when not enough cash is released to allow the household to divide its consumption according to its taste.

Incentive to work

The receipt of the subsidy of food may reduce the incentive to work simply by relieving the household's pressing need for food. Since earning beyond the permissible income would result in the loss of eligibility to participants, a strong reluctance to increase earnings must exist near the limits of eligibility. But, unlike the food-stamp program, food distribution does not give rise to a comparison between each added dollar of income and the corresponding reduction in the amount of the subsidy, because the content of the food package does not vary with income. Food distribution does not penalize the recipient who augments his income as long as his income remains below the prescribed limit.

Discouragement from participation

Like the food-stamp plan, the food distribution program burdens the participant with the process of certification and the embarrassment of a needs test. Under the food distribution program, getting the food and taking it home may be more costly to the recipient than buying it with food stamps at the neighborhood grocery. The fixed food package may not be to his taste. On the other hand, food distribution is usually more private and, therefore, less humiliating than buying with stamps in a store. But probably the most important advantage to the participant is that he does not have to make any payment under the food distribution program corresponding to the purchase requirement under the food stamp plan. That the food distribution program was attractive to the participants in the fiscal year 1970 is shown by the high rate of participation, 85 percent of eligible persons.[56]

Effect on the economy

The local government is likely to prefer the food-stamp program to food distribution. The food-stamp program's chief advantage over food distribution is that the former brings in extra purchasing power from the outside stimulating demand without cost to the county, while the latter brings in only commodities and requires local government expenditures. A comparison of the two programs in Kentucky concluded:

> The Commodity Foods Program drains the county budgets and fails to stimulate the local economy. On the other hand, the Food Stamp Program is conducted at no cost to the county and stimulates the local economy.[57]

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[56] U.S. Department of Agriculture, Food and Nutrition Service ; cf. *supra*, n. 39, Segal's much lower estimate of participation under the food-stamp plan.
[57] Spindletop Research, Inc., *op. cit.*, p. 5.

A consideration of the sources of the federal funds, however, probably would not allow so definitive a conclusion.

Summary

Unlike the food-stamp program, the food distribution program
(1) Requires no cash payment from the participant.
(2) Never makes the household reduce its purchases of non-food items.
(3) Releases cash for all households.
(4) Offers only a fixed package of food.
(5) Does not reduce the food subsidy with increased income, unless the participant moves out of the eligible class.
(6) Adds to the expense of the county government, while getting more subsidy for each dollar of federal expenditure.

C. Supplemental Food Program

The full title of this program, begun in late 1968, is "Supplemental Food Program for High-Risk Health Groups." [58] It provides selected foods for home consumption to supplement the existing diet of low-income women before and after the birth of their children and of pre-school age children. The program is small in size compared with the food-stamp program and food distribution to needy households (see table 1). Since its start in fiscal year 1969, it has expanded in cost and numbers of participants. By the fiscal year 1972, 192 thousand persons were participating at a cost to the federal government of $12.8 million (see table 10).

ELIGIBILITY

The categories of persons receiving supplemental food are: Women during pregnancy and the year following the birth of the child; infants up to one year of age; and children from 1 through 5 years of age.[59] To be eligible the recipient must be a member of a needy household as demonstrated by his being certified as "eligible for benefits under existing Federal, State or local food, health or welfare programs for low-income persons." [60] In addition, the personnel of a public health clinic or physician treating welfare cases must find the person to be in need of the extra nutrition and prescribe which of the foods are to be distributed to him.[61] If the recipient is also a participant in the food-stamp or food distribution program, the supplemental food is an additional subsidy. In the fiscal year 1972, 75 percent of the participants in the supplemental food program were in areas having a food-stamp program.[62]

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[58] U. S. Department of Agriculture, Consumer Food Programs, CFP (CD) Instructions 708–5, 11/14/68.
[59] 7 CFR 250.14(d)(3) : programs receiving federal approval after April 17, 1970 do not include the category of children over a year old (Note 1, FNS (FD), Instruction 708–6, Exhibit A, Rev., 3/7/72.
[60] 7 CFR 250.14(b).
[61] 7 CFR 250.14(c).
[62] The average monthly participation in food-stamp areas was 129,248 and total participation was 172,298. (Data from U.S. Department of Agriculture, Food and Nutrition Service.)

TABLE 10.—SUPPLEMENTAL FOOD PROGRAM: FEDERAL GOVERNMENT EXPENDITURES, PARTICIPATION, AND MONTHLY BENEFIT PER PERSON, 1969–72

	Expenditures (millions)	Participants [1] (thousands)	Benefits (per person, per month)
Fiscal year:			
1969	$1.0	40	$6.08
1970	7.8	147	6.88
1971	12.8	202	[2] 5.84
1972	12.8	192	[2] 6.19

[1] Peak month of year.
[2] Calculated as 1/12 of yearly benefit.

Source: U.S. Department of Agriculture, Food and Nutrition Service.

THE FOODS DISTRIBUTED

In the fiscal year 1972, the average amount of food distributed per person per month under the supplemental program was 31 pounds.[63] The distributed foods vary according to the recipient. Infants under six months may receive milk, cereal, juices, and syrup. In addition, women and older children receive meats, egg, peanut butter, and vegetables. Milk is the most important of the foods distributed, both in quantity and in cost to the government. In fiscal 1970, dry and evaporated milk made up 47 percent of the total weight distributed and 44 percent of the cost.[64] The average monthly subsidy per recipient is in the neighborhood of six dollars (see table 10). The supplemental food is given out locally at centers already set up for food distribution or at a health facility.[65]

EVALUATION

The supplemental food program is like the food distribution program for needy households in that it 1) gives pre-selected foods to needy persons living in households, 2) requires no payment from the recipients, and 3) is distributed by a public non-commercial agency. It would be expected to have the same effects as the food distribution program on consumer satisfaction, temptation to sell the food illegally, and released cash, if it were not for several important differences between the two programs. The supplemental food program differs from the broader food distribution program in being made only for certain members of needy households, in requiring an order from a public health facility or physician, and in providing only a restricted group of foods appropriate for the eligible classes. These differences probably will moderate the effects noted earlier for the food distribution program.

The fact that the program identifies certain individuals within the household as being in need of more nutritive foods and that these foods are prescribed by health personnel probably serves an educational function in changing the tastes of the mother. As a result, she may develop a preference for the recommended nutritious foods over other previously preferred foods or non-food items, such as clothing, and

[63] One-twelfth of quotient of 64 million pounds, total of distributed food, and 172 thousand participants, the monthly average. (Data from U.S. Department of Agriculture. Food and Nutrition Service.)
[64] Calculated from data from the U.S. Department of Agriculture, Food and Nutrition Service.
[65] 7 CFR 250.14(e).

not suffer dissatisfaction when a change in her pattern of consumption is introduced from outside the household.

D. Food Certificate Program

The Food Certificate Program, begun on an experimental basis in the fiscal year 1970, consists of a number of pilot projects. It helps the same highly vulnerable groups as the supplemental food program by means of a plan more like the food-stamp program. Possible results to be achieved by trying this program are: 1) The development of a satisfactory substitute for the supplemental food program which is not economical when food stamps replace food distribution in a county; and 2) the promotion of the use of infant foods fortified with iron and the increased consumption of milk by the mothers.[66]

It is like the food-stamp program in its use of existing retail stores and in its substitution of books of certificates for money. Eligible persons receive books of certificates which may be spent like money in participating drug and retail grocery stores.[67]

This subsidy differs from food stamps in that it demands no payment from the participants, is available only to a selected class of consumers, offers only a narrowly limited choice of foods, and does not vary according to income or family size. The books are isued at no charge for women during and up to a year following pregnancy and for infants through their first year.[68] The certificates are exchangeable only for milk, infant formula, and infant cereal.[69] Regardless of household size or income an eligible woman certified to participate receives certificates each month worth $5.00 for herself and $10.00 for an eligible child.[70]

ELIGIBILITY

Women and infants in the target classes may get food certificates if they already receive public assistance or food stamps. A State agency responsible for infants' health services may name still others for the program.[71] Those not automatically certified can be admitted to the program upon application provided their household income and resources fall below the standards set for the food-stamp program.[72] During the fiscal year 1972 a monthly average of 12,261 persons participating in the pilot programs received $1,067,360 in certificates or an average per person of $7.25. Fifty-five percent of the participants were women and 45 percent were infants.[73]

EVALUATION

The evaluation by a sample survey of the program in two counties by R. E. Wunderle and D. L. Call did not find the program effective in meeting its goals.[74] They concluded that it was successful in reach-

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[66] Robert E. Wunderle and David L. Call, *An Evaluation of the Pilot Food Certificate Program in Chicago, Illinois and Bibb County Georgia* (Ithaca, New York: The Graduate School of Nutrition, Cornell University, April, 1971, p. 1.
[67] 7 CFR 265.8.
[68] 7 CFR 265.2 (e).
[69] 7 CFR 265.2 (d).
[70] 7 CFR 265.6 (b).
[71] 7 CFR 265.5(a).
[72] 7 CFR 265.5(b) ; see table 2.
[73] Calculated from data from U.S. Department of Agriculture, Food and Nutrition Service.
[74] *Op. cit.*

ing a high percentage of the target population and that the participants were well satisfied with it.[75] But the pilot programs did not result in a significant increase in milk consumption by mothers or pregnant women or in milk or formula by infants. This failure of the food certificate program to achieve its purpose of raising the consumption of certain foods has made it instead a program of income maintenance.[76] In other words, the subsidy was converted into released cash. They recommend more research on the relation of diet to the health of mothers and infants and possibly more instruction in nutrition needs for the program participants.[77]

III. Food Served to Children

The subsidies of this section take the form of grants-in-aid to the states and are designed to assist the serving of free or reduced-price food to children in schools and other specified non-residential institutions. The subsidies of food for children are examined here in four subgroups, as follows:

A. The National School Lunch and Related Programs;
B. Special Food Service Program;
C. School Breakfasts; and
D. The Special Milk Program.

They were established by the National School Lunch Act of 1946 and the Child Nutrition Act of 1966, as amended.[78] The Department of Agriculture administers them. The stated purposes of all these programs are to protect "the health and well-being" of American children and to promote the consumption of agricultural commodities.[79] From the start of the National School Lunch Program in 1946 until the Food Stamp Program moved into first place in the fiscal year 1971,

TABLE 11.—THE FINANCING OF MEALS SERVED TO CHILDREN, FISCAL YEAR 1972 (ESTIMATED)

[In millions of dollars]

Federal:	
Cash payments to States:	
School lunch (sec. 4)	252.6
Special assistance (sec. 11, free and reduced price lunches)	502.0
Nonfood assistance	17.8
Nonschool food program (special food service)	42.6
School breakfast	26.6
Special milk program	95.0
State administrative expenses	3.2
Total cash	939.8
Commodities:	
Commodity procurement (sec. 6)	64.0
Surplus commodity distribution (sec. 32 and 416)	251.1
Total commodities	315.1
Nutritional training and surveys	.6
Federal contribution	1,255.5
State and local: contribution including children's payments	1,660.6
Total	2,916.1

Source: "The Budget of the United States Government, Fiscal Year 1974, Appendix," p. 206.

[75] *Ibid.*, p. 7.
[76] *Ibid.*, p. 8.
[77] *Ibid.*, pp. 8–9.
[78] Pub. L. No. 91–190, 60 Stat. 396; and Pub. L. No. 89–642, 80 Stat. 885.
[79] 42 U.S.C. 1751; and 42 U.S.C. 1771.

the federal government spent more on subsidizing food served exclusively to children than on either of the two major programs of food subsidies to households—Food Stamps and Food Distribution to Needy Persons. Each of the four categories of subsidies to children's food is discussed below in relation to the apportionment of federal foods among the states, the corresponding obligations of the states to match and disburse the funds, the eligibility of the recipients, and the size of the program.

A. The National School Lunch and Related Programs

The present National School Lunch Program began in 1946, but it might be said to have started twenty years earlier with the federal distribution of surplus foods, of which schools have been major recipients. The current program for providing nonprofit, reduced-price, or free lunches is the oldest and by far the largest of the subsidized food services for children. Its grants-in-aid to the states are to encourage both public and nonprofit private schools to serve lunches at cost and to make them available to the needy students free or at a reduced price. In 1968, the Act was amended to include the Special Food Service Program allowing similar subsidies to food served to children in non-residential service institutions, such as day-care centers and settlement houses (see below, Section B).

The federal grants for children's lunches in school fall into four categories:

(1) General food assistance (Section 4 funds). Cash grants to the states (or in some cases directly to nonprofit private schools) to be used to buy food.[80]

(2) Special food assistance (Section 11 funds). Additional cash grants to buy, prepare and serve food to the neediest students.[81]

(3) Nonfood assistance. Grants to states (or in some cases directly to nonprofit private schools) to permit the poorest school districts to buy equipment essential to the operation of a lunch program.[82]

(4) Donations of agricultural commodities instead of cash. Federal grants only to schools participating in the National School Lunch Program of commodities bought by the Secretary of Agriculture with funds appropriated for school lunches (Section 6 funds); and federal grants to schools in the lunch, breakfast or "commodity-only" programs and to non-residential institutions in the Special Food Service Program of commodities bought by the Secretary of Agriculture with funds arising from tariffs on imports (Section 32 funds), and of surplus foods bought by the Commodity Credit Corporation under the price-support program (Section 416 funds).[83]

1. APPORTIONMENT AMONG THE STATES AND DISBURSEMENT

(a) *General food assistance.* According to Section 4 of the National School Lunch Act of 1946, the Secretary of Agriculture 'apportions the funds to pay for the food used in the school lunches among the states according to a formula. The allocation to each state depends on

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[80] 42 U.S.C. 1753 ; and 7 CFR 210.11(a).
[81] 42 U.S.C. 1759a (a) ; and 7 CFR 210.11(a).
[82] 42 U.S.C. 1774 ; and 7 CFR 220.15.
[83] 42 U.S.C. 1755 ; 7 U.S.C. 612c ; and 7 CFR 250.1(b)(1).

the number of lunches served and per capita income, as two indicators of need.[54] The formula may be written as follows:

$$\text{Percent of total for State } x = \frac{P_x N_x}{\displaystyle\sum_{\text{for all states}} (PN)}.$$

P_x is the "participation rate" for a given state, being the number of approved type lunches which were served in the 'fiscal year beginning two years prior to the one for which the apportionment is being made.[55]

N_x, the "assistance need rate" for the state will be a number between 5 and 9, obtained as follows: The average per capita income for the three most recent years is calculated for each state and for the nation. If the three-year average per capita income for a given state is greater than that for the nation, then $N_x = 5$. But if the average for the state is less than the national average, then N_x will be five times the quotient of the average national per capita income and that for the state, with the restriction that N_x cannot exceed 9.[86]

TABLE 12.—SCHOOL LUNCH PROGRAM, STATES RANKED BY APPORTIONMENT OF SEC. 4 FUNDS, FISCAL YEAR 1970

Rank and State	Participation rate (in millions)	Assistance need rate	State percent
1—New York	249	5.0	6.47
2—Texas	173	5.7	5.10
3—North Carolina	142	6.5	4.79
4—Georgia	140	6.5	4.51
5—Louisiana	120	5.0	4.06
46—Vermont	6	5.6	.20
47—Rhode Island	7	5.0	.19
48—Wyoming	6	5.4	.16
49—District of Columbia	6	5.0	.16
50—Alaska	4	5.0	.11

Source: Adapted from data from U.S. Department of Agriculture, Food and Nutrition Service.

The greater size and range of values of P make it a much more powerful determinant than N of the allocation of the total appropriation among the states. In this way the funds are directed to the states serving the most lunches. For example, in the fiscal year 1970 although New York and Alaska had the same assistance need rate of 5, New York's percentage of the appropriation was 65 times as great as Alaska's because of the great difference in their participation rates (see table 12).

But if states have equal participation rates, the formula favors the low-income states. Their advantage is less than it would be if their compensation for low per capita incomes were offset by a correspond-

[84] 42 U.S.C. Sec. 1753; 7 C.F.R. 210.4(a).
[85] 7 C.F.R. 210.2(m).
[86] 7 CFR 210.2(b). A table of assistance need rates for the fiscal year 1970 suggests that it is unlikely that any of the 50 states or the District of Columbia would ever have a calculated N greater than the upper limit of 9. The three-year average per capita income for the United States was $3,183 and for Mississippi, the state with the lowest per capita income, was $1,906; N for Mississippi equaled 5 times the quotient of $3,183 and $1,906 or 8.3. But Guam, Puerto Rico, the Virgin Islands, and American Samoa, all with per capita incomes below $1,700, have calculated values of N greater than 9 and, therefore, an assigned N of 9 (data from the Food and Nutrition Service, U.S. Department of Agriculture).

ing spread of penalties exacted from the high-income states. The asymmetrical assistance need rates temper and distort the effects of a distribution proportional to the participation rate. If P were the same for all states, the formula would award to states with per capita incomes below the national average a larger share of the appropriations than they would have received under an equal division among the states, but a smaller share than they would have received according to a distribution inversely proportional to per capita income. The explanation of the pattern of apportionment lies in the weighting systems of the formula. It treats every state having per capita income equal to or greater than the national average as if it had per capita income only just equal to the average. At the same time, it recognizes the dispersion of per capita incomes below the national average.

In allocating the Section 4 appropriation, the formula takes account of the need of each state for funds to maintain its already established school lunch program and the need of its population as indicated by the average per capita income. But it may work an injustice on the poor in omitting other important indicators of need including the number of needy children for whom no school lunch program exists and the distribution about the average of personal income within the state.

The state educational agency then distributes the funds for general cash assistance to the participating schools according to the numbers of each type of lunch served. Reimbursement is for the cost of food for the children's lunches and not for cooking or serving them.[87] The state agency sets the price per meal subject to a federal ceiling. The Secretary of Agriculture sets the maximum reimbursement allowed per meal. By 1971, the rising ceiling had reached 12 cents for each Type A lunch served. [88] The reimbursement towards the cost of food for a non-profit lunch is the same whether it is served free, at a reduced price, or at the full price.[89]

 (b) *Special cash assistance.* The recognized failure of the school lunch program to find and feed all needy school children led to the revision and expansion of the law. In 1970, the National School Lunch Act was amended to authorize additional appropriations starting in fiscal year 1971 for special assistance to finance the bringing of children from low-income families into the lunch program.[90] This special assistance for needy children in school should not be confused with another aspect of the program to be discussed below, i.e., the Special Food Service Program for children in institutions other than schools.

The amended act recognizes in apportioning the special funds the variations in incomes and the numbers of school-age children within each state. The formula designed to apportion the funds for special assistance among the states uses different variables from those in the formula allocating the general cash food assistance. At the outset, three percent of the funds are allocated to Puerto Rico, the Virgin Islands, Guam, and American Samoa and divided among them proportionate to the number of children aged 3 through 17 years.[91] The remaining 97 percent of the funds is apportioned among the 50 states and the District of Columbia in proportion to the number of their

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[87] 7 CFR 210.11(a) ; and 42 U.S.C. 1757.
[88] 7 CFR 210.11(b).
[89] 7 CFR 210.11(b).
[90] Pub. L. No. 91–248, 84 Stat. 214, Sec. 11 ; 42 U.S.C. Sec. 1759a (a).
[91] 42 U.S.C. Sec. 1759a(b) ; and 7 CFR 210.4(d).

children from 3 through 17 years of age belonging to households with annual incomes under $4,000.[92]

If some of the states cannot use all the funds allocated to them, the remaining sum is reapportioned according to the same formula. As in the case of the general cash assistance funds, the Food and Nutrition Service withholds and distributes directly through its regional offices that part of the special funds destined for private nonprofit schools whenever the state cannot legally handle them.[93]

During the first year of the special cash assistance, fiscal 1971, there was criticism of the apportionment of the special funds and of their inadequacy. Some critics objected that the money did not go where it was most needed. The states in need of more funds objected to the slow process of repeating the same apportionment system to reallocate the funds refused by other states unable to use them.[94] The average reimbursement had not been sufficient to provide free or reduced price lunches to all needy children as directed by law.[95] In fiscal 1971, the average general assistance by federal cash payment had been 6 cents and the special assistance 31 cents per lunch.[96] In November 5, 1971, a joint congressional resolution provided that additional funds be drawn from the agricultural appropriation known as Section 32 funds, consisting of 30 percent of the gross revenue of import duties and available to the Secretary of Agriculture for fostering the distribution and use of farm products outside the market process.[97] Funds were to be used from this source to increase the special cash assistance per lunch.

The state agencies pay the special cash assistance funds to those schools qualifying for this program to reimburse them not just for the cost of the food but also for preparing and serving the food.[98] Reimbursement from special cash assistance towards the cost of the free lunches may be paid up to 40 cents and also up to 40 cents towards any loss on a reduced price lunch.[99] Schools recognized as especially needy because they serve an unusually high percentage of free and reduced price lunches or because their costs are relatively high may be reimbursed at a higher rate up to 60 cents per lunch.[100] Such schools would receive the maximum combined general and special cash assistance of 72 cents. But the maximum permissible reimbursement per lunch cannot exceed the cost of providing the lunch.[101]

(c) *Nonfood assistance.* A relatively small but highly important part of federal assistance to school meals is the grant to pay for equipment used in transporting, keeping, preparing, and serving the food. Some schools would be able to enter the lunch or breakfast program only if they received outside financial assistance for buying equipment. In 1946, Section 5 of the National School Lunch Act authorized an annual appropriation of $10 million for equipment. In 1966, Section

[92] 42 U.S.C. Sec. 1759a(c) ; and 7 CFR 210.4(d).
[93] 42 U.S.C. Sec. 1759a (c) and (f) ; and 7 CFR 210.4 (d) and (e).
[94] Edward J. Hekman. "Remarks at the Association of School Business Officials Convention, Montreal, Canada, October 27, 1971," U.S. Department of Agriculture, Food and Nutrition Service (mimeographed), pp. 2–3.
[95] Pub. L. No. 91–248, 84 Stat. 214, Sec. 11(a) ; and 42 U.S.C. 1759a(a).
[96] "Food and Nutrition Service," *The Budget of the United States Government, Appendix, Fiscal year 1973*, Washington, D.C., 1972, p. 202.
[97] 7 CFR 250.1(b)(3) ; Pub. L. 92–153, 85 Stat. 419 ; and 7 U.S.C. 612c.
[98] 7 CFR 210.11(a).
[99] 7 CFR 210.11(c).
[100] 7 CFR 210.11(d–1).
[101] 7 CFR 210.11(d).

5 (a) and (b) of the Child Nutrition Act authorized additional funds and directed their allocation to the poorest areas.

Initially the funds for non-food assistance were apportioned among the states in accordance with the formula of Section 4 of the National School Lunch Act. In 1970 to encourage non-participating schools to enter the program for school meals, the manner of apportionment was changed by an amendment to both the National School Lunch Act and the Child Nutrition Act. Under the revised system of apportionment, one-half the funds for non-food assistance are distributed among the states according to the percentage in each state of the high school and grade school children of all states attending schools without a program for meals at school. The distribution of the other half of the funds for non-food assistance continues according to the original formula.[102]

The state agency reimburses eligible schools for nonfood purchases from the funds apportioned by the federal government. Reimbursable expense includes installation charges as well as the price of the equipment. The state can give the schools no more than three-fourths of their expenses, thus taking care of the matching requirement at the time of reimbursement (see below, p. 1099).[103]

(d) *Food distribution.* From the beginning of the food distribution program in 1936 school lunches have received donations of surplus commodities. The federal government donates foods to the school lunch program under the agricultural programs known as Section 32 and 416 designed to remove surpluses and support agricultural prices and under Section 6 of the National School Lunch Act of 1946.[104] Unlike the cash subsidies to the school lunch program and to nonfood assistance, the foods donated under Sections 32 and 416 are not apportioned among the states by means of a formula. Instead they are sent according to the requests of the schools, approved by local school authorities and transmitted by the state educational agency.[105] But the apportionment of the Section 6 funds is by formula, according to the average number of approved lunches served per day in the schools participating in the National School Lunch Program.[106]

2. OTHER STATE RESPONSIBILITIES

In addition to the disbursement of the federal funds, the state agency is responsible for the general administration of the programs, including making audits in the schools, accounting for all federal funds, and the filing of annual reports.[107] Basic to the paying out of the federal funds are the determination of the eligibility of each recipient school and the meals it serves, and, then, the approval of the pupils in each school selected locally as being eligible for free or reduced rate meals.[108] The state agency is charged further with meeting the matching provisions of the programs.

Eligibility. The state agency chooses the schools eligible for general cash assistance in accordance with both their need and attendance.[109]

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[102] Pub. L. 91–248, 84 Stat. 214, Sec. 2 ; 42 U.S.C. 1774 (a) and (b) (1970) ; and 7 CFR 220.12(a).
[103] 42 U.S.C. 1774(b) ; and 7 CFR 220.17.
[104] 7 CFR 250.1(b) 1, 3, and 6.
[105] 7 CFR 250.6(g) ; and 7 CFR 210.14(d–1).
[106] The Breakfast and Special Food Service programs also receive Section 6 foods (*Ibid.*).
[107] 7 CFR 210.14.
[108] 7 CFR 210.8(c) ; and 7 CFR 210.11.
[109] 7 CFR 210.8(c)(1).

Those schools receiving special cash assistance must show that they have need in that they have children unable to pay for the school lunches.[110]

The state agency selects the schools to receive nonfood assistance from those schools making application on the basis of the poor economic conditions in the school district and the inadequacy of its existing equipment.[111] Other criteria for selection are the assurance that the school will participate in either the lunch or breakfast program and a clear demonstration of its inability to buy the necessary equipment with existing resources.[112]

Schools receiving food donations are of two classes—those in the school lunch program and the "commodity only" schools.[113] The state agency not only passes on the eligibility of the schools applying for food donations, but also recommends variations in food donations commensurate with needs.[114]

Once the schools to receive cash and food subsidies are selected, the benefits of general cash assistance, nonfood assistance, and donated foods are equally available to all children buying lunch in those schools. But in the case of special cash assistance providing free and reduced price lunches, the problem of a needs test for individual eligibility arises. The rules used by the local school authorities in deciding which children are eligible must be approved by the state agency. These include the amount of family income if local standards exceed the minimum set by the Secretary of Agriculture, the size of family, and the number of children from the family attending school or service institutions.[115] The neediest children have priority.[116]

Matching. Each dollar granted to a state as general cash assistance provided under Section 4 of the National School Lunch Act must be matched by three dollars from within that state to be spent on the program.[117] Matching funds originating in a state include payments by the children themselves and by state and local governments to cover the cost or reasonable value of commodities, services, supplies, and equipment, but not of land or buildings.[118] A specified percentage of the matching funds must come from state revenues, starting with four percent in the fiscal year 1972 and rising to 10 percent by the fiscal year 1978.[119] The required matching funds are reduced for each state having average per capita income below the national average by the same percentage that its income falls short of the national average.[120] In those states not permitted by state laws to handle the grants for lunches in nonprofit private schools matching funds in the same proportion must come from the expenditures of the private schools.[121]

The federal grants for nonfood assistance also require matching by state and local funds. The matching conditions differ both in proportion and source from those for school lunches. The matching ratio for nonfood assistance is only one dollar of state and local funds for each

[110] 7 CFR 210.8(c)(2).
[111] 42 U.S.C. 1774(a) ; and 7 CFR 220.16(b).
[112] 7 CFR 220.16(c) ; and 42 U.S.C. 1774(c).
[113] 7 CFR 210.2(c–1).
[114] 7 CFR 210.14(d–1).
[115] 7 CFR 245.3.
[116] 7 CFR 245.6.
[117] 42 U.S.C. 1756 ; and 7 CFR 210.6(a).
[118] 7 CFR 210.6(c).
[119] 7 CFR 210.6(b).
[120] 7 CFR 210(6)(j).
[121] 42 U.S.C. 1759.

three dollars of federal funds.[122] But unlike the matching of federal assistance for the purchase of food for school lunches, the money paid by school children for meals cannot be counted for matching nonfood assistance.[123] The exclusion of children's payments for lunch, which in fiscal 1970 made up over half of the state and local payments towards school lunches, means that in matching the state and local governments have to put up a higher percentage, although a much smaller sum, of the nonfood assistance than of the general cash assistance.[124]

The other two grants related to school lunches, special cash assistance and federally donated foods, require no specified proportion of matching by state funds. But these subsidies contain an implicit requirement for some matching since state and local expenditures are needed to fulfill the obligations accepted by the state in receiving the grants. The state must transport within its borders, store, and distribute the commodities donated to the schools.[125] Also the state educational agency must administer the cash grants made as special assistance under Section 11 to help feed the neediest children.[126]

3. STATISTICS

An estimate placed the total cost of meals served to children under federal programs in the fiscal year 1972 at $2.9 billion (see table 11). Of this amount, State and local contributions including the payments made by children for the meals amounted to $1.7 billion. The remainder of $1.3 billion, or 43 percent of the total cost, was the amount of the federal subsidy. The bulk of the total federal subsidy for child nutrition—$1.1 billion or 85 percent of it—was for the school lunch program, second only to food stamps among the food subsidies (see tables 1 and 11). The greater part of the federal school lunch subsidy is in cash, with less than a third consisting of donated commodities. The biggest of the federal subsidies for serving food to children is the Special Cash Assistance for meals for the neediest children.

In Fiscal 1972, approximately 4 billion lunches were served. Over half of all school children were participants in the school lunch program. In the year's peak month of December, 1971, 25.4 million children in more than 82 thousand schools ate lunches under the program. Almost a third of the children received the lunch free or at a reduced rate.[127] During the year, the overall average benefit per child from the federal subsidy to school lunches was $32.96. This average is not representative of the benefits to the children because of the variety in the amount of the subsidies. Two-thirds are paying for their lunches which have been subsidized by a federal cash grant not exceeding 12 cents.[128] The remaining have received free or reduced price meals supported by a cash subsidy in the neediest schools of as much as 72 cents per lunch.[129] In Fiscal 1972, the average annual benefit for a child paying for a regularly subsidized school lunch was about $11

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[122] 42 U.S.C. 1774(b) ; and 7 CFR 220.14(a).
[123] 7 CFR 220.14(b).
[124] Based on data from the U.S. Department of Agriculture, Food and Nutrition Service.
[125] 7 CFR 250.6.
[126] 42 U.S.C. 1759a(g) ; and 7 CFR 210.3.
[127] Based on data from the U.S. Department of Agriculture, Food and Nutrition Service.
[128] 7 CFR 210.11(b).
[129] Twelve cents for general cash for food assistance (7 CFR 210.11(b)) plus 60 cents for special cash assistance to an especially needy school (7 CFR 210.11(d–1)) ; see above, p. 1097.

and for a child receiving a free or reduced price lunch was about $115.[130]

Nonfood assistance is the smallest of the federal subsidies of meals served to children (see table 11). In order to bring schools from poor areas into the child nutrition programs, funds for non-food assistance were expanded in the fiscal year 1971. The amount of federal non-food assistance grew from $7 million in fiscal 1967 to $37 million in 1971, and dropped back to $18 million in the fiscal year 1972. In fiscal 1971, the non-food assistance went to 15,156 schools with an enrollment of 7.4 million pupils.[131] The federal cost averaged $2,453 per school receiving non-food assistance and $5.03 per student in those schools.

The federal government's initial subsidy through food donations supplements the newer cash subsidies to school lunches. The donations separated by "Section 6" foods bought expressly for the school lunch program and by "Sections 32 and 416" surplus foods follow (in millions) : [132]

	Sec. 6	Sec. 32 and 416	Total
Fiscal year:			
1970	$64.4	$201.4	$265.8
1971	64.3	214.9	279.2
1972	64.3	251.1	315.4

In fiscal 1971 about one-third of the total federal subsidy to school lunches was in food donations. The percentage of the subsidy given in food donations has declined as Section 11 special cash assistance for needy schools has expanded.

B. Special Food Service Program

The School Lunch Program had not provided food for children in non-educational and custodial types of nonresidential institutions. To fill this gap, in 1968, the National School Lunch Act was amended by the addition of Section 13 authorizing the initiation of the Special Food Service Program, a nonschool food program of meals for some children during the long summer vacation and for pre-school and handicapped children during the entire year.[133] It provides federal grants to the states for breakfast, lunch, supper, or between-meal supplements in non-residential service institutions, including summer camps, settlement houses and day-care centers—especially in poor areas where there are many working mothers.

The apportionment of federal funds among the states takes into consideration both the numbers of children and family incomes.[134] Two percent of the appropriation is set aside for the outlying areas of Guam, Puerto Rico, Virgin Islands, Samoa, and the Trust Territories. From the remaning 98 percent a basic $50,000 is available for each state and the District of Columbia. The remainder is allocated by a formula similar to that used for Special Cash Assistance, being di-

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[130] U.S. Department of Agriculture, Food and Nutrition Service.
[131] *The Budget of the United States Government, Appendix, Fiscal Year 1973*, pp. 202–3.
[132] *The Budget of the United States Government, Fiscal Year 1973, Appendix*, p. 203 ; and . . . *Budget . . . 1974, Appendix*, p. 206.
[133] 42 U.S.C. 1761(a).
[134] 42 U.S.C. 1761(b) ; and 7 CFR 225.4.

vided proportionally according to the number of children in each state from 3 through 17 years of age in families having annual incomes below $3,000.[135]

The state agency uses the federal grant to reimburse the eligible service institutions offering approved meals for part of their cost for the food and equipment for transporting, storing, and preparing it.[136] Reimbursement is at specified rates which in 1972 were 30 cents for lunch or supper, 15 cents for breakfast, and 10 cents for supplemental food, with a higher ceiling of rates for specially poor institutions.[137] Matching is required only for the nonfood assistance, one-fourth of the cost of which must be borne by the service institution.[138]

In comparison with the school programs, the nonschool food program is small, but it has expanded rapidly since its beginning in the fiscal year 1969 as the following data show:[139]

	Fiscal, 1969	Fiscal, 1972
Outlets (peak month)	2,048	10,398
Total average daily attendance (peak month)	138,414	1,082,084
Total meals served	10,300,000	184,100,000
Total Federal expenditures	$1,660,000	$37,500,000
Benefit per person	$26.73	$36.67

A high percentage of the children benefitting from Special Food Service are in attendance only during the summer. The Fiscal Year 1972 average summer attendance was five times the year-round attendance. In 1971, four-fifths of the meals were served free or at a reduced rate, and two-fifths were described as supplemental meals or between-meal snacks.

C. School Breakfast Program

The Child Nutrition Act of 1966 provided the initial authorization for the School Breakfast Program to be directed especially towards schools with needy children and with children who have to travel a long distance to school.[140] While still small relative to the lunch or milk program (see table 11), the School Breakfast Program is expanding. Amendments to the Child Nutrition Act have increased the funds authorized and broadened the groups to be reached. The funds authorized to be appropriated have been raised from $7.5 million for fiscal 1967 to $25 million for fiscal 1973.[141]

The funds appropriated for the school breakfast program are apportioned among the states by a combination of two methods. First, each of the 50 states, the District of Columbia and Puerto Rico receives a uniform grant of $50,000, and Guam, the Virgin Islands, and American Samoa each gets $15,000.[142] Second, the remaining bulk of the appropriation for school breakfasts is divided among the states according to the same formula as that used for the apportionment of the school lunch appropriation—the formula using both participa-

[135] See above, p. 1097.
[136] 7 CFR 225.1.
[137] 7 CFR 225.10 (b) and (e).
[138] 7 CFR 225.14.
[139] Based on data from the U.S. Department of Agriculture, Food and Nutrition Service.
[140] Pub. L. No. 89–642. 80 Stat. 885, Sec. 4.
[141] Ibid.; and Pub. L. No. 92–32, 85 Stat. 85, Sec. 2, June 30, 1971.
[142] 42 USC 1773(b); 7 CFR 220.4.

tion in the lunch program and per capita income to apportion the general food assistance portion of the school lunch funds.[143]

Thus the states and the District of Columbia rank in the same order according to their receipt of funds for the breakfast program as for the general food assistance under Section 4 of the National School Lunch Act with New York receiving the most, Texas second, down to Alaska and Nevada receiving the least.[144] But the variation among the states is less for the breakfast funds, because a part of the total grants is distributed uniformly among them.

There is no requirement for the explicit matching of the federal funds by the state and local governments. In administering the breakfast program, they will incur some additional expense, a part of which may be met by federal grants for state administrative expenses.[145]

The state agency uses the funds to reimburse eligible schools for approved breakfasts served free or at a reduced rate to needy children. Reimbursement is in an amount up to 20 cents for a free breakfast and 15 cents for a reduced-price breakfast.[146] Especially needy schools are allowed higher reimbursement up to 30 cents and 20 cents respectively.

While the formula used to apportion the federal funds among the states is not based primarily on the location of needy pupils, the selection within the state of the schools to receive the funds gives priority to the poorest schools. The criteria for the eligibility of schools include location in a poor district and a high proportion of pupils from poor families, from homes where the mothers work, or who travel a long way from home to school.[147] Schools participating in the school lunch program use the same standards for selecting the pupils eligible for free or reduced-price breakfasts as they use for free or reduced-price lunches.[148]

In comparison with the school lunch program, the breakfast program is small, having less than three percent as many participants. But the breakfast program is of greater relative importance than a comparison of the totals suggests, since a higher percentage of the breakfasts than of the lunches is served free or at a reduced price and the average participating pupil is needier.

In the fiscal year 1971, a federal cash subsidy of $19.4 million was paid for 125.5 million breakfasts or an average of about 15 cents per breakfast.[149] Approximately three-fourths of the breakfasts were served free or at a reduced rate. Over six thousand schools were participating in the breakfast program by the Spring of 1971. The average number of children served per day was 697 thousand at an average annual benefit per child of $27.79.

D. The Special Milk Program

The present Special Milk Program was begun in the fiscal year 1955 under the Agricultural Act of 1954.[150] This legislation provided that funds of the Commodity Credit Corporation up to $50 million should

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[143] 42 USC 1753 ; 7 CFR 220.4.
[144] See "Apportionment of School Breakfast Program Funds Pursuant to Child Nutrition Act of 1966. Fiscal 1972. 7 CFR 220, App.
[145] 7 CFR 220.19 and 220.21.
[146] 7 CFR 220.9.
[147] 42 U.S.C. 1773(c) ; and 7 CFR 220.7.
[148] 7 CFR 220.7(a-1).
[149] Based on data from the U.S. Department of Agriculture, Food and Nutrition Service.
[150] Pub. L. No. 83-690, Sec. 204(b).

be used in each of the fiscal years 1955 and 1956 ". . . to increase the consumption of fluid milk by children in non-profit schools of high-school grades and under."

Subsequent legislation has increased the amount of the federal contribution, extended the program beyond the schools, and provided relatively greater subsidies for the neediest schools. In 1956, the program was enlarged to apply not only in schools but also in ". . . non-profit nursery schools, child-care centers, settlement houses, summer camps, and similar nonprofit institutions devoted to the care and training of children.[151] Since September 1961, a special category of schools, defined as "needy," has been provided more generous subsidies in order that they may serve milk free of charge to needy children.[152]

As compared with the School Lunch Program, the Special Milk Program is small in both its total federal cost and the cash value of the subsidy received by each child. But it is important in that it subsidizes a nourishing food to many children who otherwise might not have it during the school day.

OPERATION OF THE PROGRAM

The Special Milk Program encourages children to drink more milk in school or day-care centers by reducing its price. The federal government provides funds to the states so that they may reimburse the schools for the difference between the cost of the milk and the price paid by the children.

The initial apportionment of federal funds among the states was made in 1955 according to the formula of Section 4 of the National School Lunch Program recognizing both participation in the lunch program and per capita income.[153] Since then, the apportionment of each year has been based on the expenditures for the reimbursement of milk purchases in the previous fiscal year.[154]

This tying of each year's apportionment to the funds used in the previous year has not frozen the pattern of the apportionment. Some states do not spend their entire allocation which is then redistributed to other states requesting additional funds, thus changing the apportionment of the funds in the following year. For example, in the 1955 allocation, the top five states in order of receipt of federal funds under the Special Milk Program were: New York, Texas, Pennsylvania, California, and North Carolina.[155] But in 1972, the first five in order were New York, California, Ohio, Illinois, and Michigan.[156] Only New York and California remained in the top five, with Texas, Pennsylvania, and North Carolina dropping down, and Ohio, Illinois, and Michigan moving up to replace them.

The importance of the Special Milk Program varies regionally. In general, over the period, 1955–1972, the most populous states with large cities have tended to move up in rank as the Southern states have moved down. In fiscal 1972, the Midwest received 34 percent of the federal funds for the Special Milk Program; the Northeast, 31 per-

[151] "School Milk Program—Extension," Pub. L. 752, Ch. 661, Approved July 20, 1956.
[152] 26 Fed. Reg. 9155 (1961) : and 7 CFR 215.2(o).
[153] 20 Fed. Reg. 4933 (1955) : for a discussion of the formula see above p. 1094.
[154] 7 CFR 215.4(d).
[155] 20 Fed. Reg. 5752 (1955).
[156] 7 CFR 215, Appendix Table.

cent; the Southeast, 15 percent; and the Southwest and Western regions together, only 20 percent.[157] But in the same year 1972, in the category of special assistance to needy schools serving free milk and receiving federal reimbursement amounting to only $5.2 million, the regional rankings of federal expenditures are decidedly different, as follows: The Western region received 43 percent (California alone getting 41 percent) ; the Northeast, 23 percent; and the Southeast, 22 percent.[158]

The state educational agency reimburses the public schools and the Consumer Food Program District Office (CFPDO) may reimburse the nonpublic institutions for at least a part of the cost of the milk served under the program. The school or other institution submits a claim showing the cost of the milk served in excess of that subsidized under the National School Lunch Program, subsidized under the Breakfast Program, and consumed by adults.[159] The amount of reimbursement per half pint of milk varies according to whether the institution operates under one of the meal programs, whether it prices the milk separately from other charges, and whether it is a "needy" school. The subsidy per half-pint of milk ranges from 2 cents to the full cost of the milk as follows:

2 cents—to schools and child-care institutions not charging separately for milk provided they are using an acceptable method for increasing milk consumption.[160]

3 cents—to schools selling milk, but not in the lunch or breakfast programs.

4 cents—the maximum payment allowed to a school serving a Type A lunch under the National School Lunch Program or serving breakfast under the School Breakfast Program. The milk required for the Grade A lunch or breakfast receives no additional subsidy under the Special Milk Program.[161] This more generous reimbursement based on school participation in the School Lunch or School Breakfast programs is designed to encourage them to make extra milk available to the students under the Special Milk Program.

Full cost of the lowest cost milk—to "needy" schools in order that they may serve milk free to needy children.[162]

As in the case of the Breakfast Program, the Child Nutrition Act does not specify any matching requirements for the federal subsidy to school milk. But it achieves a similar result by providing only a partial reimbursement for the milk purchased and, in this way, forces the schools to spend more than the amount of the subsidy. An exception is the full reimbursement made for the cost of milk for the needy children in the relatively small number of "needy" schools. Usually the non-reimbursed expenditure of the school is passed on to the children as the price of the milk. Thus the consumers provide an implicit matching when they buy the milk at a price equal to the excess of its cost over the subsidy.

The school or other institution receiving the reimbursement is obliged to use the payment to reduce as much as possible the price paid

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[157] Calculated from data from the U.S. Department of Agriculture, Food and Nutrition Service.
[158] Calculated from data from the U.S. Department of Agriculture, Food and Nutrition Service.
[159] 7 CFR 215.10 (b) and (d).
[160] 7 CFR 215.8(d).
[161] 7 CFR 215.8 (a) and (b).
[162] 7 CFR 215.8(e).

by the children for the milk.[163] But the institution is allowed to apply the reimbursement to its expenses incurred in serving the milk up to a ceiling of one cent per half-pint (in exceptional situations the ceiling is raised to 1.5 cents). Every child buying milk sold under the program receives a subsidy. In the peak month of fiscal 1971, 157 thousand needy children in 7,615 needy schools received free milk. In each of the other approximately 90 thousand schools and other institutions participating in the program, no differentiation was made among the children, each child in a given institution receiving the same reduction in the price of a half-pint of milk.

<div align="center">STATISTICS</div>

The amount of milk served under the Special Milk Program rose from 0.4 billion half-pints in the initial fiscal year 1955 to 3.0 billion half-pints in each of the four fiscal years from 1965 through 1968 and since then has declined to 2.6 billion half-pints in each of the fiscal years 1971 and 1972.[164] The average federal subsidy for each of the 2.6 billion half-pints of milk served under the Special Milk Program is about 3½ cents. Over the past decade, the annual federal subsidy has been in the vicinity of $100 million. Over the same period, with the expansion of subsidized programs for feeding children, the federal subsidy to the Special Milk Program has declined as a percentage of the total federal contribution to child nutrition. The annual benefit available to a child attending school every day was relatively constant, rising only slightly each year from $6.03 to $6.43 over the period from fiscal 1968 to fiscal 1972.

TABLE 13.—NUMBER OF NATIONAL SCHOOL LUNCHES, SCHOOL BREAKFASTS, AND HALF-PINTS OF MILK UNDER THE SPECIAL MILK PROGRAM, FISCAL YEARS 1968-72

[In millions]

Fiscal years	Lunches	Breakfasts	Milk
1968	3,218	37	3,036
1969	3,368	40	2,944
1970	3,565	72	2,902
1971	3,848	126	2,570
1972	3,956	168	2,610

Sources: The number of breakfasts in 1968 from "The Budget of the United States Government, Appendix, Fiscal Year 1971," p. 145; all other entries from FNS:PRS.

But the trends observed in the Special Milk Program do not give the full picture of the size and direction of federal subsidies to milk in the schools. The School Lunch Program and the Breakfast Program also involve a subsidy to milk since it is included as a part of an approved type of lunch or breakfast.[165] Most of the milk served in the schools is with meals and is subsidized under the School Lunch and Breakfast programs rather than under the Special Milk Program (see table 13). Over the four-year period, 1968-72, when the amount of milk served under the Special Milk Program has declined, the total amount of milk served in the schools has increased as the lunch and breakfast programs have expanded. The Special Milk Program has remained especially useful to those schools not serving meals. Thus it

[163] 7 CFR 215.8(b).
[164] Data from U.S. Department of Agriculture, Food and Nutrition Service.
[165] 7 CFR 210.10(a)(1)(i); and 7 CFR 220.8(a)(1).

is not surprising that as the number of lunches and breakfasts served has increased, the amount of milk served under the Special Milk Program has declined. If each breakfast and lunch is assured to include a half-pint of milk, then the increased number of meals served has raised the school consumption of milk by more than enough to offset the decrease in milk served under the Special Milk Program.

The following rough estimates for fiscal 1972 indicate the size of the participation in the Special Milk Program. Ninety-two thousand schools or 79 percent of the approximately 116,000 elementary and secondary schools in the United States were in the program, and about 14 million students or over one-fourth of the approximately 52 million elementary and high school students participated. In addition, the program reached several hundred thousand children in participating non-school child-care centers.[166]

The 2.6 billion half-pints of milk served in both schools and child-care centers is not a negligible amount in the total market, being about 3 percent of all the fluid milk consumed away from the farm.[167]

E. Evaluation

To meet the aim of feeding children, the subsidies to children's meals are superior to either commodity distribution or the food stamp program. The child nutrition subsidies are more efficient in getting the food to children, in improving the quantity and quality of their diet, and in avoiding the temptation to engage in dishonest transactions. Some specific differences follow:

1. The subsidies of this section are aimed exclusively at improving the nutrition of children. While children are supposed to benefit along with the rest of the household from the increased food provided under the food stamp program and food distribution, the child nutrition programs offer free or reduced-price meals only to children.

2. Even in the case of those children who simply substitute a subsidized school meal for a home-prepared meal with no increase in the amount of food, there often is an improvement in the quality and composition of their diet. The menus qualifying for the program are required to meet standards of nutrition designed by specialists in the field. In addition to giving the child the necessary foods for his current health and development, the program is designed to accustom the child to eating a proper diet and to teach him to choose healthful foods. On the other hand, the food stamp plan leaves the choice of food to the housewife, and food distribution does not prescribe how the donated foods are to be combined nor what supplements are to accompany them.

3. They probably release less cash to subsidized families per dollar of subsidy than either of the other two major categories of food sub-

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[166] Enrollment for the fiscal year 1970 in the 116.307 public and non-public schools in the United States was 52,100,765 (Food and Nutrition Service, U.S. Department of Agriculture. Annual Statistical Review. FY 1970. Food and Nutrition Program, p. 31.) In April, the peak month of fiscal 1972, the number of schools in the program was 92,215. The total number of half-pints of milk served in schools during fiscal 1972 under the Special Milk Program was 2.5 billion (FNS:PRS). Under the assumption that a participant consumes one half-pint of milk daily, an estimate of 14 million participants is obtained by dividing 2.5 billion half-pints by 180 school days. In fiscal 1972, 128 million half-pints of milk were consumed under the program in the child-care centers (FNS:PRS). Under the assumption that a participant in these institutions consumes 2 half-pints of milk daily on each of 240 days, an estimate of 270 thousand children is obtained by dividing 64 million pints by 240 days.

[167] *The Budget of the United States Government, Appendix, Fiscal Year 1973*, p. 204.

sidies. Released cash is additional cash available to the household to be spent on food or other items. Increased expenditure on other items is contrary to the purpose of the food subsidies. The less cash that is released by a dollar of subsidy, the more the subsidy may be counted on to achieve its purpose of increasing food consumption.

Cash is released when government food subsidies reduce the amount of its own money the household would otherwise spend on food. Because the subsidies to children's food reach the child in small daily increments, the family may not be sensitive to the effect of the subsidy. The person buying the groceries may not alter the customary purchases of food and no cash may be released as a result of the receipt of federal funds. In contrast, food stamps or distributed foods are received in less frequent installments and in larger amounts. The housewife cannot ignore these subsidies and may substitute them for cash which she otherwise would have spent on groceries.

4. The matching requirements of the school lunch and non-food assistance programs give more encouragement to the spending on nutrition of both private and government funds at the state and local level than do either the food stamp or commodity distribution programs. The greater part—70 percent in the fiscal year 1970, 63 percent in 1971, and 57 percent in 1972—of the funds devoted to the program of children's meals is non-federal.[168] Most of the state and local payments are those made by the children in buying their lunches. This does not mean that some children pay in order to subsidize the lunches of others. All qualifying lunches receive some subsidy. But the participation of large numbers of paying children in the lunch program helps to bring the scale of operation of the meal service to an economical size facilitating the simultaneous financing of the reduced price and free lunches. The schools would sell fewer lunches, take in less lunch money, and many schools would not operate any lunch room at all, if it were not for the support and encouragement of the federal program.

In contrast, the distribution of commodities requires no local expenditures beyond the cost of distribution. The provision of bonus food stamps requires a matching payment by the participants. But these local payments for food stamps are a smaller percentage of the total than is the case under the child nutrition programs. The payments by the food-stamp participants are less than one-half the total value of the coupons and expenses of administration—48 percent in the fiscal year 1970 and 44 percent in 1971 and 1972.[169]

5. There is little possibility for dishonest recipients to convert these subsidies-in-kind to cash. While there can be no certainty that every child will eat the school meals, it is difficult to imagine his being able to sell any significant part of the food for cash. Whereas, a dishonest recipient of distributed food or food stamps may be tempted to try to convert the food to cash.

IV. RECOMMENDATIONS

Technical Problems

An examination of the food subsidies discussed above suggests two recommendations of a technical nature regarding the integration of the subsidies and their adjustment to inflation. First, it is apparent

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[168] Calculated from data in *The Budget of the United States Government, Appendix, Fiscal Year 1973*, p. 203 ; and . . . *Budget . . . 1974, Appendix*, p. 206.
[169] Calculated from data in *The Budget of the United States Government, Appendix, Fiscal Year 1973*, p. 205 ; and . . . *Budget . . . 1974, Appendix*, p. 208.

that the food subsidies have evolved in response to contemporary economic problems and public demand. The result is a lack of uniformity as, for example, in the rules for the apportioning of funds and determining eligibility, and a probable multiplication of administrative tasks. It is suggested here that consideration be given to a unification of the food subsidies into a single program. Second, inflation here, as elsewhere, results in inequities. It affects differently the values of the subsidies to the consumers under food distribution and food stamps. Also, the impact varies between levels of government. Under the food stamp program with its built-in adjustment to inflation, the federal government absorbs, at least in part, the burden of rising food prices.[170] But the added cost of the school lunch is shifted to the state and local authorities and to the parents of the children. Here some means should be sought to reduce and equalize the effects of inflation on the various food subsidies.

No attempt is made here to present a solution to the above two technical difficulties, since they should be resolved by persons experienced in the day-to-day operations of the programs. The chief proposals made here concern not the technical details of the legislation but two issues of principle discussed below.

Principles of Subsidies

GOALS

The recent inflation of food prices has reduced interest in the initial agricultural goals of reducing surpluses and supporting prices. Currently the important problems for food subsidies are those of alleviating hunger and improving the diet of the needy, especially for the young and the aged.

In seeking a satisfactory solution to the problems of subsidizing food to the needy consumer, certain apparent drawbacks in the existing programs should be avoided, including the following:

(1) Complicated procedures like those called for by the issuance, use, and redemption of food stamps;

(2) The embarrassment and loss of dignity experienced by consumers having to use food stamps instead of money;

(3) The granting of a subsidy intended to do one thing when in fact it may do another, as, for example, when a significant part of the subsidy in food stamps may be spent for nonfood items through "released cash";

(4) The fostering of illegal actions such as the sale of foods bought with food stamps by the recipients of the subsidy who are dissatisfied with the pattern of expenditures imposed upon them.

The following two major recommendations are offered here for consideration as a means of combatting the above difficulties:

(1) Change the household food subsidies from the present in-kind subsidies to one received and spent in the form of cash, and substitute education for the consumer in the elementary principles of nutrition for the attempt to enforce a pre-determined pattern of expenditure.

(2) Continue and expand the present programs of serving food to be eaten on the spot, such as the food now served to children in schools,

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[170] 7 U.S.C. 2016(a).

camps, and day-care institutions, and to the elderly as "meals-on-wheels."

Cash subsidy.[171]—The substitution of cash for in-kind subsidies would add nothing to the problems of determining the need or amount of the subsidy; would give freedom to households to select their foods and to allocate their expenditures between food and non-food items; would offer no incentive to illegal action in spending the subsidy; would eliminate the public identification of participants, embarrassing to the individual and drawing often unfavorable attention to the program; and would use whichever existing markets are selected by the participants. It will be objected correctly that all recipients of a cash subsidy would not spend it sensibly. But probably it is not only offensive but futile to try to enforce an unwanted pattern of consumption on a dissatisfied consumer. Besides, consumer choices different from the prescribed pattern sometimes may be better for the household. The argument here is that a cash subsidy accompanied by simple information on basic food requirements could make sure that families are not suffering from inadequate diets through either ignorance or the lack of funds.

FOOD EATEN WHERE SERVED

Food eaten where served.—The second recommendation is in support of the programs serving food to children to be eaten in schools, camps, and day-care institutions.

The fact that the child eats the food where it is served him has important advantages. The food is eaten by the persons for whom it is intended with little opportunity for cheating through the transfer of the food to someone else. A not unimportant part of the child's education is his learning through the school lunch about unfamiliar dishes and sometimes even acquiring a taste for healthful meals.

Unlike the food subsidies to households, food served to children contributes frequent, but small, increments to the total food eaten by the household. Although the school lunch may be important in the child's diet, many households may not change their food purchases or the meals served at home when the child substitutes the meal in school for food formarly eaten at home or carried to school. In these cases, the subsidy adds to total food consumption. A release of cash equivalent to the subsidy is likely only when the introduction of subsidized school meals leaves the household with the cash previously used by a child to buy lunch.

The regulations forbid the identification of the children receiving free or reduced-price meals.[172] To the extent that the school is successful in concealing who pays and how much, and who does not pay at all, the children are spared embarrassment.

If a significant expansion of the child nutrition programs were less costly, consideration should be given to whether it might be desirable to supply free lunches to all school children. Universal free

[171] A recent Brookings Institution study has criticized the in-kind feature of the food-stamp program. The authors give some of the justification for a number of in-kind subsidies, including: Medical care, requiring large lump sum payments; higher education, believed to benefit society; and building houses, leading to improvements in the technology of production. None of these reasons is sufficient justification for a subsidy to increase food consumption. They write: "Of all the in-kind programs, food stamps probably have the weakest justification." Charles L. Schultze, Edward R. Fried, Alice M. Rivlin, and Nancy H. Teeters. *Setting National Priorities: The 1973 Budget* (Washington: The Brookings Institution, 1972), p. 208.
[172] 7 CFR 245.8.

school lunches would avoid the always troublesome needs test to determine which children are from households qualifying for subsidized lunches. But even a perfect test of ability to pay would not assure help for all the undernourished students. Affluence does not assure good nourishment. Children with adequate money to spend on their lunches do not always buy the food best for their needs. As many citizens now accept free textbooks and free bus transportation as a part of the educational process available to every child, they might also support the principle of serving adequate food at public expense, not only to sustain the child during the school day, but also to supplement his diet with nutrients which he may lack. But unfortunately the increased annual cost would exceed $1 billion.[173] An addition of this size to the cost of the program would be particularly unacceptable at a time of difficulty in financing the very schools themselves.

Another group benefitting from food served where it is to be eaten is made up of households of elderly persons who can pay for "meals on wheels" with food stamps.[174] This means of serving meals to the elderly has the advantage of efficiency in feeding a target group in need of help. Unfortunately these cooked meals delivered to the home by nonprofit organizations are not available everywhere. By sparing the elderly the need for marketing and cooking, putting ready-to-eat food into their homes makes it possible for many of them to continue to maintain their own independent households. Food stamps used to buy these meals probably are well spent. A cash subsidy should do as well. But this is a recommendation not only to continue subsidizing the purchase of such meals by needy elderly households, but in addition to grant a new subsidy to the nonprofit organizations themselves to enable them to expand the programs where they now operate and to start similar programs in other places.

The recommendations made above are based on the belief that the food subsidies should be planned with the consumers', not the producers', difficulties in mind. These difficulties are individual incapacities preventing work and food preparation, ignorance of nutritional needs, irresponsibility in the use of food, and above all poverty resulting from a multiplicity of causes. Ultimately the solution must lie in reducing these problems. In the meantime, the food subsidies should offer a means of making sure that no one has to suffer from a lack of simple but adequate food.

APPENDIX A

SOME POSSIBLE EFFECTS OF THE FOOD STAMP PROGRAM ON FOOD EXPENDITURES

Figure A1 is designed to illustrate the varying effects of the Food Stamp Plan depending on income and the desired expenditure for food. It assumes a household of four and a monthly net income of $200. The chart is to be read only vertically or horizontally. Areas have no meaning. The horizontal axis shows quantity of food measured in what can be thought of as uniform packages costing one dollar each, and the vertical axis shows quantity of non-food purchases measured in uniform packages costing one dollar each.

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[173] In fiscal 1972, the reimbursement to each of the 3,955.9 million school lunches served under the program was 6.4 cents; of these, the 1,274.4 free or reduced price lunches received an additional 39.4 cents. Raising the reimbursement of all the lunches only to the level of this latter group would cost over $1 billion. (Calculated from data in *The Budget . . . Fiscal Year 1974, Appendix*, p. 206.)

[174] *Supra.*, pp. S–9 ; and 7 CFR 270.2 (r).

Figure A1.   THE FOOD-STAMP PROGRAM, FOUR-PERSON HOUSEHOLD

$200 MONTHLY INCOME

Food (units of $1 each)
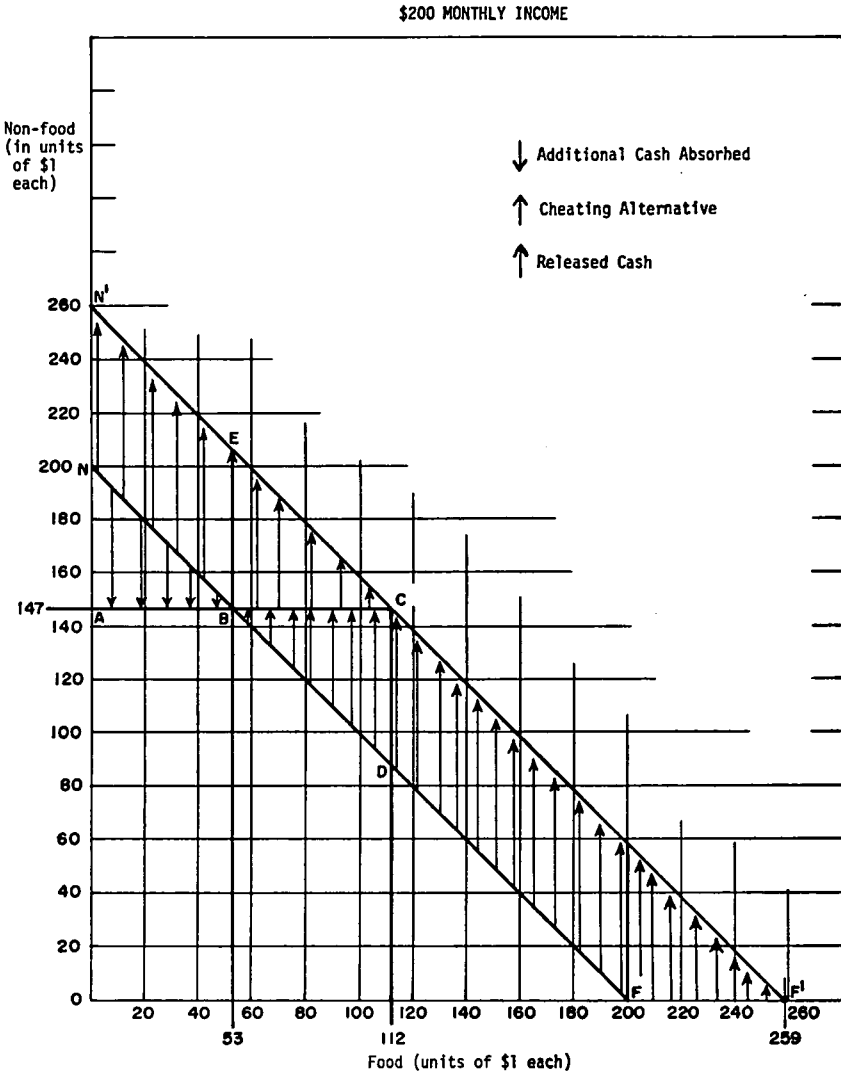
   The line NF shows the possible combinations of food and non-food items which the household can buy with its income of $200 per month. For example, if they purchase 120 units of non-food items costing $120, they can purchase 80 units of food items costing $80. Possible expenditures can range from the extreme position N, representing an expenditure of $200 on non-food items and no expenditure on food to the opposite extreme at F representing no expenditure on non-food items and $200 on food.

   The household may think of the receipt of free coupons under the Food Stamp Plan either as an increase in its income or a decrease in the price of food. It is assumed here to be considered an increase in income. The household of four with a net monthly income of $200 must pay $53 for the monthly allotment of $112 in food stamps. The excess of the allotment over the purchase requirement is $59, which can be regarded as an increase in income to $259 with certain restrictions on how it is to be spent.

The line N^1F^1 represents the possible combinations of food and non-food items if the bonus of $59 could be spent in any way the household chose. But participation in the Food Stamp Program requires that they spend for food at least the sum of $112 received in the form of food stamps. Thus the line representing the possible combinations permitted of food and non-food purchases is not N^1F^1, but ACF^1. The segment AC shows the maximum expenditure permitted on non-food items as the excess of $259 over $112, or $147, accompanying any expenditure on food up to $112. Expenditures on food in excess of $112 requires smaller expenditures on non-food items as indicated by the segment CF^1.

Upon entering the Food Stamp Program, the participating four-person household with $200 per month will be able to increase its food consumption by $59—the value of the free coupons. Whether the household complies happily with the requirements of the program will depend upon its customary expenditures. Some households will enjoy released cash, a second group will find that they can increase their satisfaction by illegally converting food or stamps into cash for expenditure on non-food items, and a third group may have to reduce their expenditures on non-food tiems in order to meet the purchase requirement of the program.

Illustrations using the same categories of households used in the text follow.

1. *Customary food expenditures before participation in the program equal to or above the monthly coupon allotment, that is from $112 to $200.* The receipt of free coupons gives the household in this category an infinite variety of choice in adding to its food and non-food purchases. For example, upon receiving the free coupons amounting to $59, a household already spending exactly the amount of the coupon allotment can do one of the following (assuming that no change occurs in its tastes that would call for a reduction in food or non-food purchases) :

(a). Use its free coupons to increase its food purchases to $171, leaving its non-food purchases unchanged at $88.

(b). Use its free coupons to replace $59 in cash previously spent on food and thus maintain its food purchases at $112; and use the cash released from food purchases to increase its non-food purchases to $147.

(c). Make an intermediate choice using only a portion of its free coupons, say $30, to replace cash previously spent on food; increasing its food purchases with the remaining $29 in stamps to $141; and using the $30 in released cash to raise its non-food purchases to $118.

For these households spending $112 to $200 on food before participation in the Food Stamp Program, the vertical distance between CF^1 and DFF^1 shows the maximum diversion from food purchases possible in the form of released cash. Within this range of food expenditures the household can attain its most desired combination of food and non-food items without illegal conversion of food or stamps. Households in this category will find the $59 of free coupons the equivalent of cash.

2. *Customary food expenditure before participation in the program falling above the monthly purchase requirement and below the monthly coupon allotment, that is above $53 and below $112.* Households in this category face restrictions in dividing the free coupons worth $59 between food and non-food expenditures. While each household can raise its food purchases by $59 above its preparticipation expenditure, it faces a ceiling of $147 on its non-food expenditures. Throughout this range of food expenditures before entrance to the program, the cash which can be released for non-food expenditures is less than $59, rising from zero corresponding to a food expenditure of $53 to reach $59 only at the top limit of $112. For example, a household spending $60 each month on food before entering the program can use its $59 in free coupons in one of the following ways:

(a). Increase its food purchases to $119 (i.e., $60 plus $59) while continuing to spend $140 on non-food items.

(b). Use $52 of its free coupons to raise its food purchases to the required monthly coupon allotment of $112 and spend the released cash of $7 (i.e., $59—$52) to increase its non-food purchases from $140 to $147 (Point C in figure A1).

(c). Decide not to comply with the requirement to raise food purchases at least to $112. For example the household may choose to spend only $20 more on food, raising total food purchases to $80; releasing cash in the sum of $7 (i.e., $147—$140) for expenditures on non-food items; and leaving unspent $32 in coupons. The household can expand its non-food purchases to the full $179 consistent with its new income equivalent to $259 and desired food purchases of $80 only by the illegal conversion into cash of the $32 remaining in coupons or food.

In Figure A1 corresponding to each pre-program food expenditure from $53 to $112, the vertical distance between BC and BD shows the maximum amount possible of legal division from food purchases through released cash, and the vertical distance between EC and BC shows the maximum possible through illegal conversion. Households in this category, enjoying less than the full $59 in the form of released cash, may be tempted to use the rest illegally for non-food purchases.

3. *Customary food expenditures before participation in the program less than the monthly purchase requirement, that is less than $53.* The free coupons release no cash to households in this category to spend as they choose. Legally they may expand only their purchase of food. There is no legal way by which they can increase their non-food purchases or even maintain their pre-participation expenditure on non-food items. Instead they must reduce their customary expenditure on non-food items in order to obtain the $53 in money required to buy the monthly coupon allotment of $112. The only choice open to them is between the legal expansion of food expenditures up to $112 and the illegal expansion of non-food expenditures beyond $147 through the conversion of food or coupons into cash. An example of the legal and illegal actions open to a household accustomed to spend $40 a month on food and $160 on non-food before entering the program follows:

(a). Legal choice: They can reduce their expenditure on non-food items by $13 (i.e., $160–$147) which combined with the $40 of customary food expenditures and the $59 of free stamps will purchase $112 of coupons. They must reduce their expenditures on non-food items to $147. This is the only legal choice open to the household.

(b). Illegal choice:

(1). They can choose instead to keep their food expenditures unchanged at $40 and illegally convert $72 of its $112 of coupons into cash for non-food expenditure. or (2). They can choose to increase their food expenditures stopping short of the legally required $112. For example, they may decide to spend only $60 on food and try to raise their non-food expenditures by $52 (i.e., $112–$60) to $199 through the illegal conversion of coupons to cash.

Corresponding to each pre-program food expenditure up to $53, in Figure A1, the vertical distance between NB and AB represents the required reduction in pre-program non-food expenditures; and corresponding to the amount of food which the household chooses to consume under the Program the vertical distance between N'C and AC represents the maximum possible illegal conversion of food or coupons into non-food purchases.

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