REGIONAL IMPACTS OF FEDERAL ENERGY POLICY INITIATIVES AND ENERGY PRICE CHANGES ON STATE AND LOCAL GOVERNMENTS

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Introduction

Traditionally, energy studies have concentrated on energy use by the industrial, commercial, and/or residential sectors. Typically, studies concentrating on the commercial sector have included within the sector energy use by the public sector. Consequently, energy use by state and local governments has not been often identified. The usual practice stems from the fact that state and local government (henceforth denoted as S & L) energy use data have not been collected and reported under an identifiable and separate category from that of the commercial sector. There are a number of exceptions at the state level, but only two studies at the national level are known to have addressed this category as a primary objective. These two studies by Bingham [1] and Lee and Bingham [6] used a modified version of the 478 sector 1967 input-output table of the United States economy which was constructed by the United States Department of Commerce. They produced estimates of the total energy content of S & L expenditures by sectors. At the state level of disaggregation, studies including estimates of the energy intensity of S & L purchases generally include energy in broad categories, and have not separated petroleum products into detailed identifiable categories. However, when energy types have been identified as, for example, in the Hite and Mulkey [4] study, the types of fuels identified and the treatment of S & L have not been comparable from one study to another. This lack of both compatibility and state level disaggregation has prevented the analysis of energy use by S & L on a state-by-state basis.

Studies by Knox [5] and Liner [7] have discussed the issue of energy use by S & L, and both suggested methods whereby energy use by S & L could be estimated from a national level of aggregation. The method used in this study drew from both of these studies; however, no attempt was made here to estimate coefficients of energy intensity of purchases by category of purchases as previously discussed.

The intent of this paper, first, is to estimate the energy intensity of all purchases by S & L at the state level by disaggregating national level coefficients. Secondly, the regional impacts of a uniform energy price policy (tax) will be discussed, and finally it will be shown that one can expect that a uniform energy price policy applied on a national basis will lead to greatly disparate impacts regionally. The vehicle used for measuring regional impacts on S & L is based on the btu value of energy embodied in each dollar's worth of purchases. This measure of coefficient permits one to take into consideration the relative burden of a price policy initiative on S & L by considering the relative changes imposed on S & L budgets required to maintain services (measured as a percentage change in outlays). Regardless of whether or not one is interested in the fiscal impacts on S & L by states, regions, or by parameters other than location, the coefficients of energy intensity of purchases provide an unambiguous expression for comparisons.

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Methodology

As mentioned above, the coefficients of energy intensity of purchases estimated by Lee and Bingham, expressed as btu/$, are regionalized to the state level. These coefficients are based on the 1967 input-output table. More recent data would be desirable from the point-of-view of providing estimates of impacts on more nearly current conditions. Unfortunately, national level input-output results of a more recent date have not been modified to present the energy intensity of purchases data needed for this study. Although desirable, newer data are not necessary to permit the demonstration that highly unequal regional fiscal impacts will emerge from uniformly applied price policy initiatives.

The national level coefficients are broken down into direct and indirect components using location quotients. Since data are not available at the state level permitting upwards of six categories of energy to be broken out using input/output, the location quotient process is used. The direct component, D_{ij}, represents energy, j, used directly in state, i. To arrive at D_{ij} the national level component is regionalized by way of commercial energy use proxies compiled by the Federal Energy Administration (FEA)[1] [2]. The commercial direct use variable, D^c_{ij}, where c denotes commercial as opposed to S & L, is used as a device to share S & L energy use by states since the commercial energy sector data include energy use directly by S & L. The total direct energy use by S & L, c^t_j, available from the Lee and Bingham study, is used as a control on the sharing scheme. An intermediate step includes allocating energy use by way of employment ratios, and this is accomplished in (1).

$$(1)\quad D'_{ij} = D^C_{ij}\left\{\left[\frac{e_i}{(e_i + E_i + G_i}\right] \Bigg/ \left[\frac{\Sigma e_i}{\Sigma(e_i + E_i + G_i)}\right]\right\} W_j$$

where D^C = energy used directly in the commercial and public administration sectors

e = employment in S & L only

E = employment in the commercial sector excluding public administration

G = employment in the public administration sector excluding S & L

W = National level fraction of directly used energy in the commercial sector accounted for by S & L only.

i = states

j = category of energy.

The employment data compiled by the Bureau of the Census [9,12] are used to allocate fuels on the basis of the assumption that energy is used directly by S & L in very much the same way as energy is used by the commercial sector as a whole.

The resulting estimates in (1) are adjusted upward or downward in (2) with the control total estimate of directly used energy by S & L, c^t_j, computed by the input-output study by Lee and Bingham.

$$(2)\quad D_{ij} = D'_{ij}\ \frac{\sum_i D'_j}{c^t_j}$$

[1] The similarity in uses of energy at the national level by both S & L and the commercial sector as listed in [2] led to the use of the commercial sector as a proxy for S & L. Additionally, the commercial sector as defined included direct energy use by S & L.

The adjustments made in (2) are based on the assumption that the magnitudes of errors made in (1) are equal state-by-state on a percentage basis. The D_{ij} values are next converted to state level coefficients by dividing by the state level estimates for purchases, P_i, which are directly compiled at the national level. The P_i values are estimated from their highly correlated proxies, state level expenditures, P'_i, which are compiled by the Bureau of the Census [11]. The national level purchases values, $P^{\Delta} = \Sigma P_i$, are compiled by the Office of Business Economics [14] and are allocated to state level in (3)

$$(3) \quad P_i = P_i' \quad \frac{P\Delta}{P'}$$

where P′ represents the aggregated form of P_j'. This procedure adjusts expenditures for S & L in state i upward or downward by the same percentage as the aggregated purchases value differs from the aggregated expenditures value. The ratio of D_{ij} to P_i now represents the state level estimate for the direct energy coefficient and is denoted by N_{ij}^1 in (4)

$$(4) \quad N_{ij}^1 = D^{ij}/P_i.$$

Since the input-output tables needed to disaggregate the national level coefficients of the indirect component are not available, this component could not be estimated on a state-by-state basis. Thus a national average estimate for this component is computed, N_j^2, using both the total and direct components aggregated to the national level. The indirect component is expressed in (5) as the difference between the total and the indirect components.

$$(5) \quad N_j^2 = N_j - N_j^1$$

where $N_j^1 = \Sigma_i N_{ij}^1$. From (4) and (5) the state level estimate for the total coefficient is combined and expressed in (6) in terms of btu/$.

$$(6) \quad N_{ij} = N_{ij}^1 + N_j^2$$

The N_{ij} values now permit estimating the short run fiscal impacts of energy price initiatives on states and regions.

To compute fiscal impacts the values in (6) are converted from a btu/$ basis to a standard unit of measure per dollar basis in (7) to facilitate interpretation of results.[2] The fiscal

$$(7) \quad V_{ij} = V_{ij}^1 + V_j^2$$

impact of a price change in fuel j due to a policy initiative can be expressed in (8) as a percentage change in the dollar value of purchases required to maintain a given level of services. The ΔPR_{ij} represents the

$$(8) \quad \Delta PR_{ij} = V_{ij} * \Delta P_{ij}$$

[2] The conversion ratios are: coal = 24.96 x 10^6 btu/ton; electricity = 3413 btu/KWH; natural gas = 1032 x 10^3 btu/1000 ft., distillates = 5.825 x 10^6 btu/bbl; residuals = 6.287 x 10^6 btu/bbl; and gasoline and other oils = 5.488 x 10^6 btu/bbl. Source [6].

Table 1. Fiscal Impact of Energy Price Change Required Percent Change in Outlays.

FUEL	COAL	ELECTRICITY	NATURAL GAS	DIST. OILS	RESIDUAL OILS	GASOLINE AND OTHER OILS
ASSUMED PRICE CHANGE+	$2.22 / ton	$.0032 / KWH	$.135 / 1000 ft.^{3}	$1.51 / bbl	$1.34 / bbl	$2.77 / bbl
			(RANKS OF IMPACTS IN PARENTHESES)			
ALABAMA	.038(29)	.29666(24)	.17755(23)	.0769(43)	.0239(38)	.6573(12)
ALASKA	.040(22)	.23464(49)	.12785(37)	.0877(15)	.0384(23)	.6187(22)
ARIZONA	.0358(*)	.41615(2)	.21083(11)	.0768(47)	.0216(47)	.6942(8)
ARKANSAS	.0358(*)	.34388(11)	.29445(3)	.0774(39)	.0213(51)	.7649(3)
CALIFORNIA	.035(42)	.30698(23)	.14160(31)	.0765(51)	.0250(36)	.5162(47)
COLORADO	.044(18)	.31531(21)	.21953(7)	.0788(31)	.0316(26)	.6017(27)
CONNECTICUT	.036(39)	.26683(40)	.11138(47)	.0940(8)	.0895(6)	.5011(49)
DELAWARE	.037(38)	.27358(37)	.11436(45)	.0785(32)	.0534(15)	.6008(28)
DIST. OF COLUMBIA	.038(32)	.24953(46)	.11484(44)	.0769(44)	.1489(2)	.4399(51)
FLORIDA	.0358(*)	.33882(15)	.12182(41)	.0768(46)	.0258(33)	.5988(29)
GEORGIA	.039(25)	.31593(20)	.15406(26)	.0768(47)	.0393(21)	.6591(11)
HAWAII	.0358(*)	.22363(51)	.09402(51)	.0766(50)	.0263(31)	.4776(50)
IDAHO	.063(2)	.47463(1)	.15122(27)	.1184(1)	.0275(29)	.6380(18)
ILLINOIS	.060(5)	.31141(22)	.20026(16)	.0832(20)	.0777(9)	.6133(24)
INDIANA	.054(7)	.28771(29)	.19221(19)	.0903(11)	.0420(18)	.6507(15)
IOWA	.045(17)	.27812(34)	.21145(10)	.0883(14)	.0252(35)	.6420(16)
KANSAS	.036(41)	.33768(16)	.23741(6)	.0782(34)	.0226(30)	.7082(6)
KENTUCKY	.050(11)	.29158(27)	.18804(20)	.0796(28)	.0216(46)	.6343(19)
LOUISIANA	.0358(*)	.33537(17)	.20904(13)	.0769(44)	.0213(50)	.5902(32)
MAINE	.042(20)	.28117(32)	.09662(50)	.1109(2)	.0908(5)	.6163(23)
MARYLAND	.039(26)	.27298(38)	.12852(36)	.0780(37)	.0834(7)	.5770(36)
MASSACHUSETTS	.037(33)	.24891(47)	.11984(42)	.1006(5)	.2443(1)	.5132(48)
MICHIGAN	.050(13)	.27799(35)	.18287(22)	.0871(16)	.0259(32)	.5171(46)
MINNESOTA	.047(16)	.24107(48)	.19837(17)	.0898(12)	.0237(39)	.5971(30)
MISSISSIPPI	.0358(*)	.35749(7)	.18610(21)	.0772(41)	.0213(49)	.6802(9)
MISSOURI	.0386(30)	.2769(36)	.2189(8)	.0818(26)	.0402(19)	.6341(20)

Table 1. (cont.)

MONTANA	.0371(37)	.3277(19)	.2607(5)	.0827(24)	.0508(16)	.7621(4)
NEBRASKA	.0376(35)	.3418(12)	.3084(2)	.0828(23)	.0246(37)	.5481(43)
NEVADA	.0388(28)	.3461(9)	.1463(28)	.0793(29)	.0231(41)	.6068(26)
NEW HAMPSHIRE	.0371(36)	.2560(45)	.1090(48)	.1079(3)	.0659(12)	.5604(40)
NEW JERSEY	.0401(23)	.2802(33)	.1235(40)	.0895(13)	.1141(4)	.5801(33)
NEW MEXICO	.0358(*)	.3407(14)	.2756(4)	.0772(40)	.0220(44)	.6533(14)
NEW YORK	.0383(32)	.2655(41)	.1268(38)	.0830(21)	.1270(3)	.5795(35)
N. CAROLINA	.0514(10)	.3449(10)	.1297(35)	.0782(35)	.0372(24)	.6406(17)
N DAKOTA	.0562(6)	.2872(30)	.1576(25)	.0988(6)	.0257(34)	.8321(1)
OHIO	.0541(8)	.2923(26)	.2092(12)	.0822(25)	.0237(40)	.5800(34)
OKLAHOMA	.0365(40)	.3338(18)	.2084(14)	.0783(33)	.0216(47)	.7097(5)
OREGON	.0399(24)	.3571(8)	.1162(43)	.0848(18)	.0786(8)	.5954(31)
PENNSYLVANIA	.0605(4)	.2626(43)	.1444(30)	.0830(22)	.0699(11)	.5629(38)
RHODE ISLAND	.0358(*)	.2314(50)	.1138(46)	.0948(7)	.0753(10)	.5545(41)
S. CAROLINA	.0508(12)	.3676(5)	.1365(32)	.0777(38)	.0335(25)	.6983(7)
S. DAKOTA	.0426(19)	.2888(28)	.2174(9)	.0935(9)	.0226(42)	.6788(10)
TENNESSEE	.0502(14)	.2726(39)	.1752(24)	.0790(30)	.0221(44)	.6551(13)
TEXAS	.0358(*)	.3612(6)	.1978(18)	.0770(42)	.0219(45)	.6269(21)
UTAH	.0482(15)	.2831(31)	.1331(35)	.0805(27)	.0399(20)	.6127(25)
VERMONT	.0390(27)	.2576(44)	.0979(49)	.1041(4)	.0385(22)	.5449(44)
VIRGINIA	.0527(9)	.3407(13)	.1358(33)	.0780(36)	.0484(17)	.5624(39)
WASHINGTON	.0377(34)	.3726(4)	.1243(39)	.0848(17)	.0649(13)	.5537(42)
WEST VIRGINIA	.0612(3)	.2941(25)	.2044(15)	.0767(49)	.0301(27)	.5196(45)
WISCONSIN	.0687(1)	.2653(42)	.1461(29)	.0931(10)	.0300(28)	.5687(37)
WYOMING	.0404(21)	.4099(3)	.3100(1)	.0836(19)	.0571(14)	.7692(2)

*** Tied for last place since this fuel was not used directly.**

+ Assumed price changes represent an approximate 10 percent increase in the then current national average prices of the respective fuels.

percentage change in dollar outlays that must be made to maintain a given level of services, and ΔP_{ij} represents the change in energy price resulting from a price policy initiative. This procedure is based on the assumption that all energy price changes are passed through to the ultimate user and that the elasticity of demand for energy by S & L in the short run is zero. For purposes of short run impact analysis the assumption of a zero elasticity of demand is thought to be reasonable since S & L are mandated by their constituents to provide a given level of service. Although for longer periods of time this assumption would have to be modified. In either case an ordinal ranking of the impacts would not change significantly.

Fiscal Impacts of Energy Policy Initiatives

The appropriateness of an energy policy initiative must be judged by its impact on those on the receiving end of such a policy. When uniform price increases (taxes) are imposed on S & L, the fiscal impacts are anything but uniform when geography and certain other characteristics are taken into consideration. When measuring fiscal impacts in the form of a percentage change in outlays required to maintain services (see (8) above), obvious differences in impacts on S & L occur when the uniform tax is imposed. Consider Table 1 where such a tax has been assumed for all states and for each of the six fuels. The taxes represent an approximate 10 percent increase in the prices of the respective fuels above the then current (1967) national averages. The resulting impacts represent the percentage change in required outlays for goods and services in order to maintain a given level of service. The values in parentheses along side each impact estimate represent the ranks of the respective impacts by state. The highest ranked impact is represented by the rank of one for each fuel. The figures in Table 3 illustrate the required changes in outlays necessary to maintain service for the five highest and lowest impacted states. Although interesting, the dollar values in Table 3 are less revealing than the percentage impacts on Table 1 because dollar impacts cannot logically be compared on a state-by-state basis.

The demographic characteristics of a state also influence the level of impact of a uniform tax. For example, for all fuels studied except residual oils, there were negative correlations between the percentage of residents in a state that lived in urban areas, as defined by the U.S. Census, and the level of impact. In Table 2 one can see that these correlations were significant at the .10 level for natural gas, residual oils, and gasoline and other oils categories. The associations were not significant for the other fuels, but the signs of the associations were uniformly negative. For residual oils which have been used extensively in large urban areas as a heating fuel the impacts were greater in urban areas than in rural areas. Except for residual oils, these correlations indicate that a uniform price increase would more heavily impact S & L serving rural areas than it would those serving a more urban populas.

In producer states where impacts were related to the level of production the association was positive for coal and significant at the .01 level. For all other fuels the associations were negative; however, only the association between impacts and distillate oil use was significant at the .10 level. The strong positive association for coal producing states reflects the high utilization of coal in producer states and the costs of transportation. The lowest impacts involving coal occurred in those states where there was no coal production or where there was insignificant production. One can see from Table 1 that the lowest impacted states were Rhode Island, Louisiana, Florida, Hawaii, Texas, Arkansas, Arizona, New Mexico, and Mississippi where coal was not used directly by S & L. Five of the top six producing states ranked in the top 11 in impacts. The one exception was Alabama

Table 2. Correlations Between Fiscal Impacts and Other Characteristics by States

		FISCAL IMPACTS BY TYPE OF ENERGY					
		COAL	ELECTRICITY	NATURAL GAS	DISTILLATES	RESIDUALS	GASOLINE & OTHER
PERCENT OF POPULATION LIVING IN URBAN AREAS++		-.173*	-.165	-.241ǂ	-.159	.299§	-.498//
		(-1.229)	(-1.171)	(-1.738)	(-1.127)	(2.19)	(-4.019)
ENERGY PRODUCTION BY PRODUCING STATES**							
Coal	(13)+	.736//					
		(3.606)					
Electricity							
Natural Gas	(20)			-.217			
				(.968)			
Distillates	(23)				-.361ǂ		
					(-1.774)		
Residuals	(23)					-.130	
						(-.60)	
Gasoline & Other	(23)						-.077
							(-.322)

* Student's t in parentheses.
\+ Number of producing states in parenthesis.
ǂ Significant at the .10 level.
§ Significant at the .05 level.
// Significant at the .01 level.
** U.S. Dept. of Commerce, Bureau of Census, Statistical Abstracts of the U.S., 1968, [13].
++ U.S. Dept. of Commerce, Bureau of Census, County and City Data Book, 1967, [9].

which ranked 29 or just below the average impact of 26. Interestingly, the highest impact, in Wisconsin, was 91 percent greater than the lowest impact in, say, Rhode Island which was tied for last.

For natural gas impacts were negatively correlated with the level of production in respective states although the association was not significant at the .10 level. Out of 20 states that produced significant amounts of natural gas, six of the top seven producers had impacts ranked 18 or higher. The six least impacted states were non-producers, and all but one, Hawaii, were in the northeast. The same kind of pattern emerged for distillate and residual oils as did for natural gas. For distillate oils the impacts were lowest in the high producing states. For example, out of the top six producing states the highest ranked impact was 33. On the other hand, the five highest impacted states were for the most part in the northeast, and these were Massachusetts, Vermont, New Hampshire, Maine and the exception, Idaho.[3] For residual oils, the top five impacted states were Massachusetts, the District of Columbia, New York, New Jersey, and Maine. For residual oils the highest impact, in Massachusetts, was 1043 percent greater than that in the lowest impacted state, Arkansas. For distillate oils the highest impact, in Idaho, was 55 percent greater than that in the lowest state, California. Thus, one can easily see that these impacts have regional identities.

For gasoline and other oils category the northeastern states, except for Maine, were less heavily impacted than was the average state.

[3] For distillates only.

Table 3. Five Highest/Lowest Impacted States From Across-the-Board Ten Percent Energy Price Increases

STATE HIGHEST / LOWEST	IMPACTS HIGHEST PERCENT CHANGE	IMPACTS LOWEST PERCENT CHANGE	REQUIRED CHANGE IN OUTLAYS HIGHEST	REQUIRED CHANGE IN OUTLAYS LOWEST
	(COAL)			
Wisconsin/Rhode Island	.0687	.0358	$1458	$151
Idaho/Louisiana	.0630	.0358	190	611
West Virginia/Florida	.0612	.0358	420	865
Pennsylvania/Hawaii	.0605	.0358	2688	168
Illinois/Texas	.0600	.0358	2586	1425
	(ELECTRICITY)			
Idaho/Hawaii	.4746	.2236	1434	1049
Arizona/Rhode Island	.4161	.2314	3455	974
Wyoming/Alaska	.4099	.2346	914	726
Washington/Minnesota	.3726	.2410	6223	4514
South Carolina/Massachusetts	.3676	.2489	2796	6039
	(NATURAL GAS)			
Wyoming/Hawaii	.3100	.0940	692	441
Nebrasks/Maine	.3084	.0966	1912	359
Arkansas/Vermont	.2944	.0979	1963	221
New Mexico/New Hampshire	.2756	.1090	1453	301
Montana/Connecticut	.2607	.1113	890	1453
	(DISTILLATE OIL)			
Idaho/California	.1184	.0756	357	8898
Maine/Hawaii	.1109	.0766	412	359
New Hampshire/West Virginia	.1079	.0767	298	526
Vermont/Georgia	.1041	.0768	235	1255
Massachusetts/Arizona	.1006	.0768	2440	637
	(RESIDUAL OIL)			
Massachusetts/Arkansas	.2443	.0213	5927	142
District of Columbia/Louisiana	.1489	.0213	682	363
New York/Mississippi	.1270	.0213	13677	170
New Jersey/Arizona	.1141	.0216	3161	179
Maine/Oklahoma	.0908	.0216	337	238
	(GASOLINE AND OTHER OILS)			
North Dakota/District of Columbia	.8321	.4399	2863	2017
Wyoming/Hawaii	.7092	.4776	1582	2241
Arkansas/Connecticut	.7649	.5011	5099	6535
Montana/Massachusetts	.7621	.5132	2603	12452
Oklahoma/California	.7097	.5162	7849	60719

From these many comparisons the point is made that a uniform energy tax will lead to important regional differences in impacts and that the range of impacts by fuels will be significantly great to warrant consideration by policy makers. They indicate the danger in assuming that a uniform energy price initiative is necessarily equitable to all regions. But on the other hand, if a policy initiative is directed toward enhancing conservation by end users, the widely differing impacts might be justified because they would encourage a greater degree of conservation on the part of those S & L that have a relatively high energy intensity of purchases. From the point-of-view of enhancing conservation, the uniform energy tax or price increase would be far more equitable and desirable in impact than would, say, a uniform percentage reduction in use would be. The uniform percentage reduction in use as a vehicle for enhancing conservation would result in inequitable impacts because already efficient users of energy as measured by energy intensity of purchases would find it more difficult to further reduce energy consumption by a specified percentage than would inefficient users. The greatest burden of adjustments would fall on the wrong groups in this situation. Thus from the posture of enhancing conservation, the uniform energy tax would be much more desirable because it would come to bear most heavily on those energy users that are relatively inefficient and those most capable of reducing energy use.

Maintenance of Fiscal Balance

From the point-of-view of maintaining a fiscal balance as an objective of state and local governments, one clearly can see that where fiscal impacts are highest the fiscal balance of governments will be disturbed the most. By considering a constrained social welfare function for a community one can see that a local government has very limited options with which to cope with an energy tax.

Using the method and notation developed by Henderson [3, pp. 156-163] the limited choices open to a local government can be clearly understood. Although the discussion that follows is developed in terms of a local community, the procedure could be easily modified to address the fiscal balance of state level government. For the social welfare function, let

$$(9) \quad W = (a_o + a_1 Y + a_2R + a_3P) \log_e G + X$$

where W, G, and X represent, respectively, a community's collective social-welfare, per capita public expenditures, and per capita private expenditures. The a_i; $i = 0, 1, 2, 3$, represent parameters of assumed exogenous variables; Y, the per capita community income; R, per capita federal and state revenues; and P, population.

The community budget constraint is developed as an equality between community private plus public expenditures and community income plus transfers to the community level from state and federal agencies. The equality is developed as follows.

Let

$$(10) \quad T = G(G - R)$$

where T represents per capita taxes and B represents the degree to which the local community bears new debt. Debt is incurred when B is less than one: New per capita debt is expressed as

$$(11) \quad D = G - T - R = (1\text{-}B)\ (G\text{-}D).$$

By substituting $T = Y\text{-}X$ in (10) the community budget constraint becomes

$$(12) \quad X + BG = Y + BR.$$

By forming the Lagrangian function

$$(13) \quad L = (a_o + a_lY + a_2R + a_aP) \log_eG + Y - \lambda(X + BG - Y - BR)$$

and differentiating with respect to G, X, and λ, the optimum mix for G and X can be found. The first and second order conditions can be shown to hold for the maximized community social welfare function which can be solved for

$$(14) \quad \begin{aligned} G &= \frac{1}{B} (a_o + a_lY + a_2R + a_3P) \\ X &= Y\text{-}B(G\text{-}R). \end{aligned}$$

Since Y, R, and P are exogenous, and given that price increase occurs, either G must increase or B must be decreased (which means more borrowing). The make-up of G cannot be easily altered to accomodate more costly energy at the expense of something else. The only other alternative would be to increase T, but, in the short run this might not be possible. Since a community government is mandated to provide certain essential services, the degree to which the components of G could be rearranged would be very limited. This leaves borrowing more (reducing B) or drawing down unencumbered reserves. To provide for an easy solution then, the community government would have to maintain a higher than intended level of uncumbered reserves.

The need to consider the impacts on S & L of federal energy policy is of a practicable as well as a theoretical necessity in view of the mandate given the Federal Energy Administration (now a part of the U.S. Department of Energy) by Congress through Public Law 93-275, May 7, 1974 [8]. This law requires that the U.S. Department of Energy evaluate the probable impacts of proposed federal energy policy changes on S & L.

External energy policy initiatives also have strong fiscal impacts on S & L. Since over 40 percent of the petroleum consumed in this country is imported from OPEC countries at world energy prices, it becomes apparent that foreign governments can impose significant and unequal burdens on S & L through the changing of energy prices. The question of appropriate funds sharing from the federal government to S & L naturally arises. Should revenue sharing be greater for those S & L that bear the greatest burden relative to their dollar value of purchases (and most probably to tax base), or should this external influence not be a factor in revenue sharing? Should an external force not be addressed in much the same way that the differences in income earning ability in different states is addressed in the revenue sharing formula? This question has not be addressed in the literature in terms of energy intensity of purchases.

Summary and Conclusions

Energy use by state and local governments has not been typically studied with the completeness accorded other sectors of the economy. A contributing factor has been the dearth of adequate data with which to work. The present paper represents one of the first attempts at disaggregating national level energy use per dollar of purchases coefficients for state and local governments to the state level. Through the use of location quotients six categories of fuels are partially disaggregated and expressed on a per dollar or purchases basis. The partially disaggregated coefficients are then used to estimate the fiscal impacts on state and local governments by states and by regions of uniform energy price changes. The findings suggest that uniform price changes imposed by a higher authority will have greatly differing fiscal impacts by states and by regions, and relative regional impacts are not the same from one fuel to another. Consequently, the equity region-by-region of a uniform price initiative depends upon the objective being sought. Whatever the objective of a uniform price policy initiative or externally imposed price change, consideration should be given to the resulting impact on the fiscal balances of the lower governments being affected. The lower governments have very limited options in the short run for adjusting to the shock effects of large energy price changes.

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