THE THEORY OF PUBLIC FINANCE IN A FEDERAL SYSTEM*

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La théorie des finances publiques dans un état fédéral. Comme l'a soutenu Richard Musgrave, l'activité économique du secteur public est nécessaire pour maintenir le plein emploi avec des prix stables, pour atteindre une distribution optimale du revenu et de la richesse et pour en arriver à un allocation efficace des ressources. Le but du présent article est d'étudier comment la responsabilité doit être partagée, dans un état fédéral, entre le pouvoir central et les autres niveaux de gouvernement pour atteindre les objectifs qu'on vient d'énumérer.

L'analyse révèle que les objectifs de stabilité et de distribution du secteur public doivent être la responsabilité du pouvoir central. Le manque de contrôle sur la masse monétaire, les limites aux émissions d'obligations ainsi que « l'ouverture » (au commerce des marchandises et aux mouvements de capitaux) de petites unités économiques réduisent considérablement la possibilité d'une politique efficace de stabilisation par les gouvernements provinciaux et municipaux. Un modèle simple pour une économie locale, incorporant les mouvements de marchandises et de titres financiers, donne un multiplicateur de budget équilibré de zéro et un multiplicateur très faible pour les dépenses publiques financées par des emprunts. De plus, la mobilité des individus et des entreprises rend les niveaux inférieurs de gouvernement incapables d'une politique de redistribution efficace. Par exemple, les efforts d'un pouvoir local pour redistribuer le revenu en faveur de résidents plus pauvres se solderaient par l'exode des riches.

Les arguments économiques à la défense du fédéralisme sont fondés sur le problème de l'allocation efficace des ressources. Dans un modèle fédéral « idéal », un individu choisit l'endroit qui offre la combinaison de services publics et de taxes qui lui convient le mieux. Dans un système fédéral visant l'efficacité, l'action du pouvoir central sera toutefois nécessaire pour obvier aux avantages et désavantages externes entre les différentes unités économiques et pour coordonner les structures fiscales locales.

In his monumental volume on public finance, Richard Musgrave[1] suggests that public economic policy has three basic objectives: (1) to establish an efficient allocation of resources; (2) to attain the desired distribution of income and wealth; and (3) to maintain high and stable levels of employment and output. Thus, for analytic purposes, Musgrave divides the public fiscal department into three branches: an Allocation, a Distribution, and a Stabilization Branch. In terms of this conceptual scheme, Musgrave then explores the economic role of the public sector.

The bulk of his analysis is in terms of a system consisting of a private sector and a *single* level of government. This leaves open the important question of how, in a federal system (like that of Canada or the United States), the responsibility for economic policy is best divided among the various levels of government. The purpose of this paper is to expand Musgrave's brief but most

*The author is grateful to Mancur Olson and Rudolph Penner for a number of helpful comments on an earlier draft of this paper. More basically, however, he is deeply indebted to John Gurley, Ronald McKinnon, and Edward Shaw for their assistance with his dissertation on which this paper is largely founded.

[1]*The Theory of Public Finance* (New York, 1959), 5.

Canadian Journal of Economics/Revue canadienne d'Economique, I, no. 1
February/février 1968

suggestive treatment of the problem.[2] The procedure will be to examine in turn each of the three branches in an effort to determine the respective roles of different levels of government in the implementation of economic policy. This task consists, to a significant degree, of taking ideas formulated in the treatment of other theoretical questions and applying them to tax and spending problems in a federal environment. This application produces, I believe, some valuable insights into the economic theory of federalism.

I / The Stabilization Branch

The purpose of this section is to examine the nature of the stabilization problem in a federal system in order to discern the roles of different levels of government in maintaining full employment with stable prices. For this purpose, it is useful to adopt a simplified federal model in which there are only two levels of government: a central government, entrusted with public matters of national scope, and "local" government bodies, which function to meet "local" needs. All government units are assumed to possess independent tax and expenditure authority. Since the nature and effectiveness of stabilization policy by central governments are now relatively well understood, the bulk of this section consists of an investigation into the efficacy of stabilization policies at the local level of government.

At the outset, it is to be stressed that local government cannot have access to one of the two basic sets of stabilization tools, namely monetary authority. The power to create and destroy money must be limited to the central government; to allow a local government the capacity to make new money would be equivalent to giving that government an unlimited claim on the real resources of other localities. Thus, as regards conventional stabilization measures, local governments must rely solely on tax and expenditure programs.

A LOCAL INCOME AND PAYMENTS MODEL

In order to investigate the potential of fiscal policy at the local-government level, we first set forth a simple income and payments model to describe a local economy. The model embodies two important simplifications. First, it is assumed that the localities are small and highly open in the sense that they have a high average and marginal propensity to import out of income. Further, we assume that the demand for any community's exports depends primarily on national economic conditions and thus can be taken as exogenously determined.

Second, we specify that, within the nation as a whole, financial capital is highly mobile. In fact, it is useful here to adopt the polar case of "perfect" capital mobility: all securities, irrespective of locality of issue, are assumed to be perfect substitutes for one another and to move without cost among the localities. This assumption implies that interest-rate differentials between communities cannot persist. In addition, we specify that a locality is also small in the sense that it can be treated as a price taker in the national securities

[2] *Ibid.*, 132–3, 179–83.

market; thus, the rate of interest is, for the community, an exogenously determined variable.

The model also includes a simple portfolio-balance argument in terms of financial assets. It must be emphasized that for small, highly open communities, it is dangerous to ignore movements of financial assets in response to trade flows. An increase in local income, for example, gives rise to a relatively large increase in imports, the counterpart to which is an outflow from the community of financial assets. This drain of financial assets must itself come to have a depressive effect on spending and income levels in the community.

The model itself is summarized in equations (1) to (3)[3]:

(1) $C(Y_d,i_0,A) + G_0 + X_0 - I\ (Y_d,\ i_0,\ A,G_0) - Y = 0,$ commodities market

(2) $L(Y_d,i_0,A) - A = 0,$ financial-asset market

(3) $X_0 - I(Y_d,i_0,A,G_0) = 0,$ trade balance

where

Y = real income,
Y_d = disposable income,
i_0 = rate of interest (exogenously determined),
X_0 = flow of exports (exogenously determined),
I = flow of imports,
G_0 = local-government expenditure (exogenously determined),
A = real value of the *net* financial-asset holdings of the private sector.

The level of income and output, Y, is assumed to be perfectly elastic at the given price level and to adjust in Keynesian fashion to the level of aggregate demand. The demand in both the commodity and financial-asset markets depends on disposable income, the rate of interest, and the real value of private, *net* financial-asset holdings. In this regard, since local governments have no monetary powers and since the price of bonds in terms of money is fixed by the externally determined rate of interest, it is convenient to aggregate the money and bond markets into a single financial-asset market. Private economic units still attempt to establish a portfolio balance as between money and bonds, but since this can be done by trading with "foreigners" at a fixed price, there is no need to take explicit account in the model of this phenomenon.

The trade-balance constraint expressed in equation (3) is a necessary condition for complete stock and flow equilibrium in the model. If (3) is not satisfied, this would imply that there is either an inflow or outflow of financial assets, which would change A and thereby disturb any existing equilibrium in the commodity and financial-assets markets. The system consists of three equations, but only two of them are independent, and they serve to determine the two dependent variables: Y and A. If, for example, (1) and (3) are satisfied, it follows from Walras' Law that the financial-asset market must be in equilibrium.

[3]For a more extensive treatment of the derivation of a similar model, see R. McKinnon and W. Oates, *The Implications of International Economic Integration for Monetary, Fiscal, and Exchange-Rate Policy*, Princeton Studies in International Finance 16 (Princeton, NJ, 1966).

To get a feeling for the way in which the model works, consider an exogenous increase in the stock of financial assets, A. Such an injection of assets into the system has a positive wealth effect in the demand functions. As a result, the local economy will have an excess demand for commodities and an excess supply of financial assets, in response to which the level of income will tend to rise. But as Y increases, imports also rise, which leads to a deficit in the balance of trade. This deficit will drain the excess supply of financial assets from the economy. Note that this drain will continue until the entire increment of financial assets is absorbed, for only then will income and thus imports return to their original, equilibrium values and thereby restore balance-of-payments equilibrium. Thus, an injection of financial assets into the system results only in a temporary rise in income, for the additional assets flow out of the economy in response to a deficit in the balance of trade. This result is not surprising, for A and Y are the dependent variables in the system; assuming the model to be stable, a change in either of these variables sets to work forces to restore the initial equilibrium solution.

LOCAL-GOVERNMENT FISCAL POLICY

Through the use of its fiscal tools in this system, what effect can a local government expect to have on the community's level of output and income? Because of certain important constraints to be discussed later, local government is compelled to place much greater reliance on balanced-budget spending than is the central government, which has much greater latitude in the use of deficit financing. Thus, we consider first the impact of balanced-budget spending in the local income model.

It is convenient, as a point of departure, to adopt one final set of assumptions, a set of symmetry conditions concerning the spending patterns of the public and private sectors. Specifically, we assume, at the margin, that government expenditures are divided between imports and commodities produced within the community in the same proportion as private expenditures. Further, we specify that the wealth effect results in a similar division of expenditures on commodities. Symbolically, we have that:

$$(4)\quad \partial I/\partial Y_d = \alpha[\partial C/\partial Y_d],$$

$$(5)\quad \partial I/\partial G = \alpha,$$

$$(6)\quad \partial I/\partial A = \alpha[\partial C/\partial A],$$

where $0 < \alpha < 1$.

Consider now a balanced-budget increase (i.e., $dG = dT$) in local-government spending. The immediate impact is to raise the level of spending in the locality, since the government's marginal propensity to spend is unity while that of the private sector is assumed to be less than one. However, given our symmetry assumptions concerning the pattern of expenditures, a rise in total spending implies an increase in imports. Thus, the increase in public expenditures will give rise to a deficit in the balance of trade, and an outflow of financial assets will result. This drain of financial assets from the local economy will tend to depress spending and income until the balance of trade again returns to zero. Given that X_0 remains unchanged, the final equilibrium

solution must involve an unchanged level of imports, for only then will the outflow of financial assets cease. Thus, we have:

$$(7) \qquad dI = \left(\frac{\partial I}{\partial Y_d}\right)dY_d + \left(\frac{\partial I}{\partial A}\right)dA + \left(\frac{\partial I}{\partial G}\right)dG = 0.$$

Substituting (4)–(6) into (7) gives:

$$(8) \qquad \begin{aligned} dI &= \alpha\left(\frac{\partial C}{\partial Y_d}\right)dY_d + \alpha\left(\frac{\partial C}{\partial A}\right)dA + \alpha dG \\ &= \alpha\left[\left(\frac{\partial C}{\partial Y_d}\right)dY_d + \left(\frac{\partial C}{\partial A}\right)dA\right] + \alpha dG \\ &= \alpha dC + \alpha dG = \alpha(dC + dG) = 0. \end{aligned}$$

Therefore,

$$(9) \quad dC = -dG.$$

Thus, private expenditure contracts by the *full* amount of the positive increment in government spending, and the balanced-budget multiplier is zero. If, then, the pattern of local-government spending as between locally produced commodities and imports is the same as that of the private sector, balanced-budget government spending simply supplants an equivalent amount of private expenditure with no net effect on the equilibrium level of income and output.[4]

The only way the local government can influence the community's equilibrium level of income through balanced-budget spending is through biasing its expenditures in favor of locally produced commodities, that is, by violating symmetry condition (5). In the limiting case, where all government expenditures are directed to commodities produced at "home," the G_0 argument drops out of the import-demand function altogether. It is thus clear that G_0 can be at any level without directly influencing the balance of trade; Y_d need no longer decline when G rises in order to keep imports equal to exports. Thus, the levels of Y_d and A are determined independently of G_0. This means that, in this limiting case, the balanced-budget multiplier is unity; the equilibrium level of income rises by the amount of the increase in public expenditure so as to maintain Y_d at its previous equilibrium level.[5]

[4]In a simple Keynesian system with no balance-of-trade constraint, the standard proof that the balanced-budget multiplier is unity depends critically on the assumption that the entire increment of government spending is directed to domestically produced goods. In general, the balanced-budget multiplier in an open system is less than one and may even be negative. On this point, see, for example, W. J. Baumol and M. H. Peston, "More on the Multiplier Effects of a Balanced Budget," *American Economic Review*, 45 (March 1955), 140–8. It should also be noted that the above analysis abstracts from possible repercussion effects on the community's level of exports.

[5]Proof that the balanced-budget multiplier is unity where $(\partial I/\partial G) = 0$.

We have that: $dT = dG$ and $dI = 0$.

$dI = (\partial I/\partial Y_d)\, dY_d + (\partial I/\partial A)\, dA = 0$.

Using symmetry assumptions (4) and (6):

$dI = \alpha dC = 0$. Therefore, $dC = 0$.

$dY = dC + dG = 0 + dG = dG$

Thus, $dY/dG = 1$.

In the less extreme case, where public expenditures involve some imports, but relatively less than in the private sector, the multiplier is positive, but less than unity. The rationale for this result is that, in such cases, government spending assumes something of an "import-substitution" character. By reducing the community's overall (i.e., public plus private) propensity to import, a higher level of income and financial-asset holdings becomes consistent with any given level of exports and imports. Conversely, should the government's pattern of expenditures entail more imports than that of the private sector, the equilibrium level of income would decline, and the balanced-budget multiplier would thus become negative. In conclusion, given an unchanged level of exports, local government, in the balanced-budget case, can raise the equilibrium level of income and employment only to the extent that it can reduce the community's propensity to import, and even then the balanced-budget multiplier will (except in the limiting case) be less than unity.

Consider next the case where the increase in local-government spending is debt-financed. The initial impact of such a program on the demand for commodities is equal to the full increment of public spending, dG, for there is no reduction in disposable income from increased taxes. Income rises, a deficit in the balance of trade results and financial assets flow out of the local economy. However, at the same time, financial assets are being pumped into the system at a rate equal to dG. Thus, a deficit in the trade balance of amount dG can exist without disturbing the state of private financial-asset holdings. This means that, in the case of public deficit-finance, equation (3), the balance-of-trade constraint, must be altered to:

$$(10)\quad (X - I) + D = 0,$$

where D = the deficit in the public budget. This is clear because, if private financial-asset holdings, A, are to remain unchanged (which is a necessary condition for equilibrium in the system), the new public securities entering the economy must flow out of the community.[6] Thus, the increment in government spending and the inflow of financial assets into the local economy will bid up spending until the deficit in the trade balance becomes equal to the deficit in the public budget, at which point private, net financial-asset holdings will cease to change further.

Income and financial-asset holdings thus rise to a level consistent with the increased level of imports. If we again adopt the symmetry conditions (1)–(3), we have, following the argument in (7)–(9),

$$(11)\quad dI = \alpha\,(dC + dG);$$

but now $dI = dG$. Therefore,

$$(12)\quad \alpha(dC + dG) = dG, \text{ or}$$

$$(13)\quad dC = [(1 - \alpha)/\alpha]\,dG.$$

From (1), we obtain

[6]This assumes that a resident of the community does not associate a public issue of bonds with an increase in his own liabilities. For a justification of this assumption, see my "Budget Balance and Equilibrium Income: A Comment on the Efficacy of Fiscal and Monetary Policy in an Open Economy," *Journal of Finance*, 21 (Sept. 1966), 491–2.

$$(14)\quad dY = dC + dG + dX - dI = dC + dG - dG = [(1-\alpha)/\alpha]\, dG.$$

Therefore,

$$(15)\quad dY/dG = (1-\alpha)/\alpha.$$

The deficit-spending multiplier thus depends solely on the relative openness of the system; it bears no relationship to the marginal propensity to save. The more open the local economy, the less expansionary is the impact of deficit spending on the equilibrium level of income. If the local economy is a highly open one with α in excess of ½, then the multiplier is less than unity.[7] Thus, even in the case of deficit-financed expenditures, the multiplier for a highly open local economy is not likely to be very large.[8]

The model also makes clear a most important characteristic of local-government debt, namely that it tends to flow out of the community. The deficit-spending multiplier depends on an unlimited willingness of the local government to alter its net asset position by creating an *external* debt for the community as a whole. Where deficit spending by the central government is in the main held by domestic residents, locally issued securities will in contrast flow largely into the hands of "foreigners."[9] Thus, local governments must treat this debt with considerably greater concern than need the central government, for the eventual repayment of local debt and interest charges will represent a transfer of income to "outsiders." This suggests that local governments have a real incentive for avoiding aggressive deficit-finance programs for stabilization purposes. Not only are the multiplier effects associated with the spending likely to be small, but there is the further disadvantage of saddling the community with a significant external debt.

Thus, in our federal model, a local government is severely constrained in its ability to influence the community's level of output and income. Local government can employ only fiscal stabilization tools, and problems of openness and external indebtedness seriously impair the freedom and effectiveness with which these tools may be used.[10]

A further difficulty regarding local-government stabilization policy arises when the compensatory problem is placed in the context of the nation as a

[7]As in the case of balanced-budget spending, the multiplier is larger if the government biases its expenditures in favour of locally produced goods. In the limiting case where $(\partial I/\partial G) = 0$, the deficit-spending multiplier is equal to $1/\alpha$.

[8]Even in the case of a simple Keynesian system where no consideration is given to balance-of-payments forces, the deficit-spending multiplier is not very large for a highly open economy. Specifically, the multiplier is equal to the reciprocal of the sum of the marginal propensity to save and the marginal propensity to import. If the latter is in excess of 1/2, then the deficit-spending multiplier must be less than 2.

[9]This has been pointed out by Jesse Burkhead in *State and Local Taxes for Public Education* (Syracuse, NY, 1963), 11.

[10]It is interesting to note that, even if a local government did have access to tools of monetary policy, it could not, by these means, alter the community's equilibrium level of income. As was discussed earlier, an injection of any kind of financial assets into the system results in a balance-of-trade deficit, which drains the entire increment of assets from the economy. Thus, an injection of money into a local economy will not affect the equilibrium level of income. Money is neutral in this model, not because changes in the stock of money induce proportional changes in the price level, but rather because nominal money holdings are restored to their initial equilibrium level through transactions with "outsiders."

whole. The impotence of conventional fiscal measures at the local level implies that local government, if it is to influence significantly the local level of employment, must find other stabilization tools. One method with some promise is to attempt to attract new spending from external sources into the community. In fact, in the United States, the bulk of the attack by state and local government on unemployment has taken the form of inducements to new industry to locate in one's own state or community. To this end, these governments have adopted a wide variety of programs, including such measures as low-interest loans and tax exemptions to incoming business. However, when viewed from the national level, these policies are largely of a "beggar-thy-neighbour" character; they represent an attempt to attract industry and spending away from other states and localities. Thus, such programs clearly are not suitable to remedying unemployment on a national scale.

The importance of this point is clear when one recognizes that the high degree of interdependence between communities means that movements in real income among the various localities tend to parallel one another. Recessions and booms tend to a great extent to be national in scope. Under these conditions, one could hardly anticipate that independent local programs, relying largely on beggar-thy-neighbour policies, would produce an effective national stabilization program.[11]

Thus, the case for the central government to assume primary responsibility for the stabilization function appears to rest on a firm economic foundation. Our local income and payments model suggests that local government cannot use conventional stabilization tools to much effect and must instead rely mainly on beggar-thy-neighbour policies, policies which from a national standpoint are likely to produce far from the desired results.[12] The central government, on the other hand, is free to adopt monetary policies and fiscal programs involving deficit finance where it is necessary to fulfill the compensatory function. Thus, the Stabilization Branch must do its job primarily at the central-government level.[13]

[11]Stanley Engerman reaches a somewhat similar conclusion: "Thus, as long as stabilization measures are left to particular states, there can be no expectation of an optimal national policy, for there may be either smaller or larger changes in demand than would be considered desirable. In the contemporary situation, given both financial constraints and interstate strategy, the presumption that stabilization measures will be insufficient if they are left to lower-level governments appears most reasonable." "Regional Aspects of Stabilization Policy," in R. Musgrave, ed., *Essays in Fiscal Federalism* (Washington DC, 1965), 53, 56.

[12]The conclusions reached here admittedly apply with less force to a federal system in which the "communities" are relatively closed, self-sufficient economies.

[13]For an application of some of these ideas to stabilization and exchange-rate policies on an international scale, both under systems of floating and fixed exchange rates, see: J. M. Fleming, "Domestic Financial Policies under Fixed and under Floating Exchange Rates," *IMF Staff Papers*, Nov. 1962, 369–80; A. Krueger, "The Impact of Alternative Government Policies under Varying Exchange Systems," *Quarterly Journal of Economics*, 79 (May 1965), 195–208; R. Mundell, "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates," *Canadian Journal of Economics and Political Science*, 29 (Nov. 1963), 475–85; McKinnon and Oates, *The Implications of International Economic Integration*; and W. Oates, "Budget Balance and Equilibrium Income: A Comment on the Efficacy of Fiscal and Monetary Policy in an Open Economy," *Journal of Finance*, 21 (Sept. 1966), 489–98.

II / The Distribution Branch

Like the Stabilization Branch, the Distribution Branch is in general seriously constrained in its operations at sub-central levels of government. The scope for an active redistributive policy depends critically upon the existing degree of mobility of both individuals and other economic resources. At the local level of government, for example, the obstacles to movement among a group of adjacent communities, especially in the long run when commitments must be renewed, are usually not very great. Thus, an attempt by a local government to undertake an aggressive redistributive program is likely to have disastrous results.[14] If a community were to institute a highly progressive income tax to redistribute income in favour of the poor, many wealthy residents would simply move to nearby communities where they could receive more favourable fiscal treatment. Thus, in the end, mobility would largely defeat the purpose of the program.

As we move to geographically larger jurisdictions (e.g., states or provinces), the impediments to movement increase; thus, the capacity for successful redistributive programs is enlarged. But, in the United States, for example, mobility even at the state level is considerable, and the scope for redistributive programs is hence modest.[15] The degree of immobility necessary to allow an effective and substantial program of income redistribution is usually present only at the national level. Thus, the primary responsibility for implementing redistributive policies must in most cases rest with the central government.

More generally, it should be stressed that a high degree of mobility of resources restricts the choice of tax programs at state and local levels. Not only people, but to an even greater degree, such things as business capital are highly responsive to differences in local fiscal treatment. A community, for example, simply cannot impose a heavy tax on productive activity in the locality without incurring the risk of inducing existing business enterprise to move to other communities or, perhaps even more serious, of discouraging the entry of potential new investment.[16] The importance of this consideration is

[14]On this point, see G. Stigler, "Tenable Range of Functions of Local Government," in Joint Economic Committee, Subcommittee on Fiscal Policy, *Federal Expenditure Policy for Economic Growth and Stability* (Washington, DC, 1957), 213–19.

[15]In this connection, see W. L. Gillespie, "Effect of Public Expenditures on the Distribution of Income," in Musgrave, ed., *Essays in Fiscal Federalism*, 122–86. This study of the redistributive impact of public expenditures and revenues in the United States suggests that, at the state-local levels, the over-all budgetary impact on family incomes in excess of $5000 is roughly neutral. Gillespie found that for this group the largely regressive character of state-local taxes is approximately offset by an equalizing pattern of public expenditures. There does, however, appear to be some redistribution of income at these levels in favour of those with family incomes less than $5000.

[16]To the extent that local-government expenditures provide improved public services resulting in lower costs to business, the damaging effect of local taxes on business may be avoided. However, the bulk of local government spending goes toward functions like education, recreation, and public welfare, which do not necessarily provide a direct benefit to local business. Thus, substantial local taxes on business are likely on net to result in an increase in costs for local firms. Another point of interest is that it is by no means clear just how responsive business firms in fact are to differences in local fiscal treatment. However, local public officials seem to believe that businessmen are very sensitive to such differentials. And this is what is important, for it means that local fiscal policy will be structured so as to avoid perverse incentives to business location.

clear from the great number of fiscal programs which sub-central level governments in fact adopt to attract business capital into their areas. It means that these governments must resort in the main to taxes which do not fall so heavily (or at least so obviously) on mobile resources. This explains to some extent the primary reliance of state and local government in the United States on property and sales taxes instead of on personal and corporate income taxation.[17] Canadian municipalities likewise have adopted property taxes as their primary source of revenue.

HORIZONTAL EQUITY IN A FEDERAL SYSTEM

"Perhaps the most widely accepted principle of equity in taxation is that people in equal positions should be treated equally."[18] However, as Buchanan has shown,[19] compliance with this principle requires, in a federal system, special equalizing measures. The source of the problem arises from the fact that, even if the central government treats equals equally, while at the same time each local government provides a uniform fiscal-package for equals within its boundaries, the *over-all* impact of central and local-government budgets is likely to violate the horizontal-equity criterion. The difficulty is that, if we consider two communities with an identical output of public goods and services, the wealthier of the two communities will, *ceteris paribus*, be able to meet its revenue requirements with a lower level of tax *rates*. To raise a given amount of revenue per resident, lower tax rates are required in a community the higher is the level of per-capita income. Thus, for a specified amount of local public services, an individual in a wealthier community will have a smaller tax bill than his equal in a poorer locality.[20] Therefore, from the standpoint of the system as a whole, equals tend not to be treated equally.[21]

[17]S. Mushkin, "Federal Grants and Federal Expenditures," *National Tax Journal*, 10 (Sept. 1957), 193–213; and J. Maxwell, *Financing State and Local Government* (Washington, DC, 1965), 128.

[18]Musgrave, *The Theory of Public Finance*, 160.

[19]James M. Buchanan, "Federalism and Fiscal Equity," *American Economic Review*, 40 (Sept. 1950), 583–90, reprinted in American Economic Association, *Readings in the Economics of Taxation* (Homewood, Ill., 1959), 93–109.

[20]There is, as Buchanan has shown in "Federalism and Fiscal Equity," also an efficiency aspect to this problem. An individual, other things equal, will tend to be attracted to a wealthier community, since he can there obtain a given level of output of public goods for a smaller tax payment. Thus, varying levels of income between communities create "artificial" incentives for location, incentives which do not reflect differences in productivity or other relevant economic considerations. This means that there will be a tendency towards a distortion in the allocation of resources in the form of over-migration into relatively wealthy communities. For a further examination of this "efficiency-in-location" problem, see the Buchanan-Scott exchange in the *Journal of Political Economy*, 60 (Buchanan, "Federal Grants and Resource Allocation," 208–17; A. D. Scott, "Federal Grants and Resource Allocation," 534–6; Buchanan's reply, 536–8); A. D. Scott, "A Note on Grants in Federal Countries," *Economica*, NS 17 (Nov. 1950), 416–22; C. Tiebout, "An Economic Theory of Fiscal Decentralization," in NBER *Public Finances: Needs, Sources, and Utilization* (Princeton, NJ, 1961), 93–4; R. Musgrave, "Approaches to a Fiscal Theory of Political Federalism," in *ibid.*, 120–2, and comments by Buchanan, 122–9, and reply by Musgrave, 132–3; A. D. Scott, "The Economic Goals of Federal Finance," *Public Finance*, 3 (1964), 241–88.

[21]This problem does not arise if local taxation is on a benefit basis. "If state taxes, imposed to finance public services, are allocated on a benefit basis, all citizens of the federation will be taxed on a benefit basis by their respective states. In this case, no central equalization is needed since the requirement of horizontal equity is met by the very condition of universal taxation according to benefits received." Musgrave, "Approaches to a Fiscal Theory," 119.

One can respond to this problem in either of two ways. First, it can be argued that, in a federal system, equal treatment of equals by the central government and independently by each local government is sufficient. "Complete over-all horizontal equality is not achieved, chiefly because its achievement is not a prime goal in a federation."[22] Thus, one can simply ignore the question of over-all horizontal equity. Alternatively, following Buchanan,[23] one can contend that central-government measures are needed to satisfy the horizontal-equity criterion. To this end, the central government can adopt either of two programs: (1) geographically discriminating tax rates at the central-government level to equalize the *total* tax bill of all individuals of equal income who reside in communities with the same level of public services[24]; or (2) redistributive payments among communities to equalize the fiscal capacity of all communities. Either of these measures would result in the like treatment of equals. Buchanan, while favouring the first, suggests that the second is probably more feasible.

In this context, it is interesting to note that the central governments in both Canada and Australia have for many years provided unconditional, equalizing grants to provinces and states. In contrast, in the United States conditional grants have been the primary vehicle for returning funds to states and municipalities. However, the tendency of late in the United States has been to include equalizing provisions in grant formulae so that the federal-government share in matching grants is larger for relatively poor states.[25] In fact, most federal public-assistance funds are now distributed among the states on such a variable-matching basis. The inclusion of terms in grant formulae to account both for need and fiscal capacity implies that the differential in tax rates between wealthy and poor states or communities to realize similar levels of public services has been reduced. Furthermore, the United States is now considering seriously the adoption of unconditional grants to the states along the lines of the Heller-Pechman Plan, a proposal which allows for modest equalization.

However, the primary motivation for equalizing grants has not been the problem of horizontal equity; it has rather been a concern for achieving a greater equality in the distribution of income and, perhaps more important, for improving the quality of public services in poorer areas. But to the degree that greater equality in the distribution of income is achieved, either by direct interpersonal transfers or by payments to poorer state and municipal governments, the objective of horizontal equity is better satisfied. Thus, to a large extent, the means to these two objectives of a more equal distribution of income and of "treating equals equally" are the same.

For our purposes, it is important to stress that the responsibility for attaining these goals must rest primarily with the central government. The mobility of economic units severely constrains the scope for local redistribution of income,

[22]Scott, "The Economic Goals of Federal Finance," 251.
[23]In "Federalism and Fiscal Equity."
[24]Buchanan generalizes his treatment in "Federalism and Fiscal Equity" by dealing with the "fiscal residuum" (i.e., tax bill minus expenditure benefits). In these terms, over-all horizontal equity requires that the fiscal residua for equals be equal irrespective of community of residence.
[25]See Mushkin, "Federal Grants and Federal Expenditures."

and the achievement of horizontal equity, as Buchanan has shown, implies central-government intervention. Thus, the Distribution Branch, like the Stabilization Branch, must perform its function primarily at the national level.

III / The Allocation Branch

The economic case for federalism is found in the Allocation Branch.[26] Where the Stabilization and Distribution branches of the public fiscal department must work primarily at the central-government level, there are compelling reasons for believing that, in the Allocation Branch, the provision of certain goods and services is best placed in the hands of local governing bodies. In the first place, one might expect that local government would be more responsive to the particular preferences of the community as regards expenditure and revenue policies. A greater reliance on the central government would probably result in a substantially higher degree of uniformity in public services among communities.

However, there is a second economic rationale for federalism, which may be of even greater importance. Public goods, by their very nature, involve compromise among the residents of a nation or community. Some individuals, for example, may prefer a high level of national defence, while others would desire a lower level of expenditures (and taxes) for this function. However, everyone in a particular nation or community must consume the same set of public goods. Thus, compromise is inevitable. There is no way out of this problem at the national level; we all, for example, by necessity receive essentially the same amount of national defence. However, at the local level, there is at least a partial solution, namely consumer mobility.[27] If, for example, an individual is unhappy with the pattern of expenditures and the structure of taxes in his community, he can, in a federal system, always move to another community which provides a "fiscal package" better suited to his tastes. Thus, in a federal economy, the efficiency of resource allocation as regards local public goods tends to be enhanced by so-called "voting-on-foot." In much the same way as consumers purchase private goods, they can to some degree select a community which provides a pattern of public goods and taxes which is in accord with their tastes.[28] Thus, we can envision a federal system in which communities provide varying levels and combinations of public goods and in

[26]A strong case for decentralized finance can also be made on political grounds. It can be argued, for example, that a federal system, in contrast to a wholly centralized form of government, provides safeguards against the excessive concentration of public power, fosters diversity and innovation, and promotes the development of a responsible and experienced citizenry by providing wider opportunities for participation in public decision-making; see, for example, John Stuart Mill's essay, *Considerations on Representative Government*, R. B. McCallum, ed. (Oxford, 1948), chap. 15. In this paper, however, we limit the argument to the economics of federalism.

[27]See Stigler, "Tenable Range of Functions of Local Government," and C. Tiebout, "A Pure Theory of Local Expenditures," *Journal of Political Economy*, 64 (Oct., 1956), 416–24.

[28]This conception of a federal system has, I believe, increasing relevance with the growing urbanization in most countries. An individual working in a central city often has a wide choice of suburban communities in which to live, and the quality of the local school system, for example, may be of considerable importance in his selection of a place of residence.

which individuals locate themselves, to some extent at least, according to their fiscal preferences.[29]

AN IDEAL FEDERAL MODEL

It is useful at this point to develop in a little more detail an "ideal" federal system and then to consider later certain important complications to this ideal model. To this end, consider, as earlier, an economic system consisting of a collection of communities, each with its own government possessed of tax and expenditure authority. The communities are tied together in a federation which provides for a central government with the power to tax economic units in all the communities to meet the cost of providing needed national public services. We assume that there are two public goods, produced in the system. The first is a national collective-consumption good, a good which all individuals in the economy "enjoy in common in the sense that each individual's consumption of such a good leads to no subtraction from any other individual's consumption of the good. . . ."[30] In formal terms, this implies that the total quantity of the good produced enters into each individual's utility function.

In this system, a primary responsibility of the Allocation Branch at the central-government level is to provide the optimal level of output of the national public good. This implies, as Samuelson and others have shown, that production of the public good should be extended to the point where the sum of all individuals' marginal rates of substitution for a unit of the public good is equal to its marginal cost.

Second, we assume that local governments provide a public good. However, this good is of a slightly different character from that produced by the central government. Specifically, the local public good is such that, although each individual in the community consumes the same quantity of the good, the utility he derives from its consumption depends not only on the quantity of the good produced, but also on the number of other people who consume the good (i.e., on the population of the community).[31] For example, the satisfaction an individual derives from the use of a local park depends not only on the size and facilities of the park, but also on the number of other visitors to the park. The more crowded the park is, the less an individual may enjoy his trip there. Thus, the local public good in this model is not a pure, collective-consumption good, for it is subject to costs of congestion.[32]

[29]On non-economic grounds, one can raise certain objections to this solution. Scott, for example, points out that "In itself, this migration will be regarded as a good thing by those who value an exchange optimum. But it will be regarded as a bad thing by those who value the continuation of grouping of peoples in a federation according to other characteristics, such as tradition, culture, law, language, or religion." "The Economic Goals of Federal Finance," 269.

[30]P. Samuelson, "The Pure Theory of Public Expenditures," *Review of Economics and Statistics*, 36 (Nov. 1954), 387.

[31]See James M. Buchanan, "An Economic Theory of Clubs," *Economica*, 32 (Feb. 1965), 1–14. Breton would prefer to call this a "non-private good"; see A. Breton, "The Theory of Government Grants," *Canadian Journal of Economics and Political Science*, 31 (May 1965), 175–87.

[32]This characterization of the local public good is not unrealistic, since most of the services provided by state and local government are in fact subject to costs of congestion (e.g., school systems, roads, recreation facilities, etc.). However, there is a fundamental theoretical

Adopting an approach suggested by James Buchanan,[33] the costs of congestion can be played off against the benefits from expanding the population of the community so as to define the optimal size of a community. Consider a locality which provides a given output of a particular good (e.g., a centrally located park). The admission of additional residents to the community benefits existing residents by allowing the costs of the construction and operation of the park to be divided among more persons. Thus, the cost (or tax bill) per resident varies inversely with the population of the community. On the other hand, as the community grows and more people use the park, a point will be reached at which additional residents impose costs of congestion on existing park users. Furthermore, the larger the population of the community, the less are the savings per resident of yet another newcomer to the locality. Thus, we can define the optimal-size population of the community as that for which the marginal gain from an additional resident is equal to the marginal cost of congestion (assuming that marginal congestion costs rise or at least do not decline more rapidly than marginal gain). After this point, the sum of the marginal rates of substitution of the existing residents for a further entrant is negative (i.e., marginal congestion cost to current residents exceeds the marginal benefits from reduced taxes per resident). Finally, we assume that, at this point, residents take action, perhaps in the form of zoning laws or building restrictions, to stem the flow of entrants and to maintain the community at its optimal size.

The introduction of the congestion factor does complicate matters a bit, for an individual in his selection of a place of residence now must take into consideration both the level of output of the local public good and the degree of congestion. Thus, our efficiency conditions are considerably more complicated than in the case of the national public good.[34] Nevertheless, one might expect that where there are a large number of communities with diverse levels of output of the local public good and with varying crowding conditions, an individual will in most cases be able to find a community which provides a reasonable satisfaction of his preferences.

Thus, we have an economy in which the Allocation Branch at the central-government level provides the efficient output of the national public good, and in which this Branch at the local level produces a wide variety of levels of output of the local public good. Individuals, with assumed full knowledge

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justification for making the local public good subject to crowding. If there were no crowding constraint, it would make little sense to have different communities produce the good. In this case, one community could provide the good for everyone, and the optimal solution would involve the existence of only a single community. Thus, the congestion condition is necessary to prevent the degeneration of the model into a single-community system.

[33]In "An Economic Theory of Clubs."

[34]The establishment of a new community, especially if its level of output of public goods closely approximates that of several other communities, represents a loss of resources in the sense that residents of this community could have consumed the output of public goods in other communities. The gain resulting from a new community stems primarily from the reduction in congestion costs it affords (and also to some degree from the greater diversity its existence may offer). Thus, as an approximation, it can be argued that the *number* of communities is optimal when the reduction in congestion costs resulting from an additional community has been reduced to equality with the costs of producing another community's output of local public goods.

of the offerings of the various communities, select a community of residence which provides a fiscal package well suited to their preferences. It remains to move somewhat closer to reality by introducing some complications into the model in order to determine what sorts of adjustments in public policies these conditions require.

SOME OBSTACLES TO ACHIEVING AN EFFICIENT UTILIZATION OF RESOURCES IN A FEDERAL SYSTEM

The "ideal" federal model just described provides a powerful case for a federal system as a means for realizing an efficient allocation of resources. If instead, a single level of output of each public good were provided by a central government, the potential increase in welfare from better satisfying diverse individual preferences for many of these goods would be lost. Nevertheless, the adoption of a federal system does in general entail certain inefficiencies which may require further public action.

The production of local public goods may, for example, result in spill-over benefits (or costs) to residents of other communities. In the case of spill-over benefits, the output of these goods is likely to be suboptimal, for a local government, seeking to maximize the welfare of its own residents, will disregard the impact of its activities on outsiders.[35] Thus, the central government should, in this instance, subsidize the production of local public goods with a unit subsidy equal to the spill-over benefits per unit of output, thereby "internalizing" the spill-over.

Somewhat less appreciated, however, is the fact that taxes levied by a local government may not fall wholly on its own residents. Through a variety of means, the taxes paid in one community may be shifted onto residents of other localities. A tax on local production, for example, may result in part in higher prices of output, which are paid largely by outsiders who purchase these goods. These spill-over costs from taxes appear to be of considerable magnitude; Charles McLure, in a recent study of the United States,[36] estimates that, on the average, roughly 20 to 25 per cent of the taxes levied at the state level are shifted onto residents of other states. The implication of such spill-over costs (assuming for the moment an absence of spill-over benefits) is that local public goods will tend to be overproduced. A community, by equating marginal benefits with marginal costs to its *own* residents, will extend production past the point where marginal benefits equal the sum of marginal costs to *all* residents of the country. Thus, where spill-overs consist both of benefits from the production of local public goods and the shifting of local taxes onto residents of other communities, the central government must, on efficiency criteria, determine the *net* spill-over benefit and employ a unit subsidy where this figure is positive or an appropriate unit tax where it is negative.[37]

Furthermore, the whole problem of efficiency in taxation acquires additional

[35]Breton, "The Theory of Government Grants."

[36]"The Interstate Exporting of State and Local Taxes: Estimates for 1962," *National Tax Journal*, March 1967.

[37]For a provocative treatment of the problems resulting from spill-overs among communities, see Alan Williams, "The Optimal Provision of Public Goods in a System of Local Government," *Journal of Political Economy*, 74 (Feb. 1966), 18–33.

dimensions in a federal system. Economists are familiar with the sorts of inefficiencies which arise when a tax is levied on a particular product or on the earnings of a factor of production. But in a federal system, further complications arise. In a simple two-factor model (e.g., labour and capital), if community *A* chooses to tax the use of labour and community *B* capital, substantial losses in total output can result. In a competitive system with mobile factors of production, such a situation will give rise to intercommunity differences in relative factor prices. Thus, the relative price and hence the marginal product of capital would tend to be higher in community *B* than in *A*. This is clearly inefficient, for it means that the aggregate level of real output could be increased by simply relocating units of the factors of production; the movement of a unit of capital from *A* into *B* would result, *ceteris paribus*, in greater output.[38] There is therefore something to be said for subcentral governments adopting similar tax structures so as to minimize the loss of output resulting from an inefficient pattern of location of productive activity.[39]

Finally, it should be stressed that taxes, which are efficient when imposed at the national level, may be highly inefficient when employed at the local level. A tax, for example, on people with brown eyes is a neutral (and efficient) tax for a closed system as a whole, as there is no way in which it can be shifted. Such a tax does not *directly* affect the terms on which individuals make choices (i.e., it has only income, no direct substitution, effects). However, the same tax is not neutral if employed by a single community, for it may, in this case influence an individual's choice of community of residence. The point here is that a tax on a factor or commodity whose supply is fixed is a neutral and an efficient tax. However, those inputs or goods which are fixed in supply at the national level may, as a result of intercommunity mobility, be in quite elastic supply to any particular community. Thus, in a federal system, there may be good reason for different levels of government to adopt quite different types of taxes.

[38]This inefficiency will tend to create artificial, inefficient patterns of comparative advantage among the various communities. A community, for example, with a natural comparative advantage in producing relatively capital-intensive goods, may, after levying a tax on capital, find itself specializing in the production of labour-intensive commodities. For an excellent study of the tax-harmonization problem in the European Common Market, see the *EEC Reports on Tax Harmonization* (the Tinbergen Report) (Amsterdam, 1963). In addition, Musgrave (*The Theory of Public Finance*, 180) and G. Break (*Intergovernmental Fiscal Relations in the United States* (Washington, DC, 1967)) treat some specific problems regarding the integration of state and local tax structures.

[39]Even if all communities employ the same tax, some inefficiencies will yet remain, since the tax rate among communities will vary, other things equal, according to the levels of output of local public goods. Thus, if all communities taxed the use of capital, the relative price of capital will tend to be higher in those communities whose residents prefer more in the way of local public goods. But this is to be expected. "The very purpose of fiscal federalism . . . is to permit different groups living in various states to express different preferences for public services; and this inevitably leads to differences in the levels of taxation and public services. The resulting differentiation in tax levels may interfere with the most efficient allocation of resources and location of industries for the region as a whole; but such is the cost of political subdivision, be it on an intranational or international level." Musgrave, *The Theory of Public Finance*, 179–80.

THE OPTIMAL-SIZE PUBLIC UNIT

In the ideal model, we considered a simplified federal model with only two levels of government and two "nicely behaved" public goods. In this system, we were able to define the optimal-size community by balancing marginal tax savings against marginal congestion costs. However, a federal system is more usually characterized by a number of different levels of government which provide a complex array of public goods and services. In addition to the central government, one generally encounters state or provincial governments, local government units, plus perhaps county or regional public bodies. Furthermore, residents frequently construct *ad hoc* public units, cutting through various levels of government, to deal with specific problems.

In this more complex sort of a federal world, a new and important question arises, namely "What is the optimal-size government unit to perform a specific function?" This problem obviously has important political dimensions, but we will limit the discussion here to the economic aspects of this decision. The first and most obvious factor to be considered is the spatial distribution of the benefits provided by the good or service. If, for example, production of the good has little impact on persons outside the community, this suggests that local government is the appropriate decision-making unit. However, if benefits are more widespread, a higher level of government is indicated. Normally, one would not expect the spatial distribution of the benefits (and possibly costs) from a particular public good to coincide precisely with the existing jurisdictions of governing units.[40] In this case, as discussed earlier, certain adjustments need to be made to account for the resulting spill-over costs and benefits.

However, the spatial nature of benefits is only one relevant consideration. Public goods frequently exhibit significant economies of scale. In such cases, the cost savings resulting from production on a larger scale at a higher level of government may warrant the transfer of a specific function to a level of government higher than would be indicated solely by the spatial distribution of benefits. It is thus clear that the determination of the optimal level of government to provide a specific good or service is likely to involve compromise. On the basis of the spatial character of benefits, a level of government may be appropriate which is quite different from that suggested by the nature of the cost function for the good.

Even this, however, is a somewhat oversimplified view of the problem. There are many facets to the provision of most public goods and services. And, for one reason or another, the interests of practically all levels of government are involved in providing something like educational services. Thus, at the policy level, Mushkin and Adams[41] have recently stressed that the relevant question is not so much which level of government should provide the service but

[40]Another approach to this problem is not to hold rigidly fixed the existing structure of government, but to allow some flexibility as regards the size of existing jurisdictions and more important some adaptability in the formation of public units based on a cooperative effort between different levels of government. On this, see S. Mushkin and R. Adams, "Emerging Patterns of Federalism," *National Tax Journal*, 19 (Sept. 1966), 225–47.

[41]"Emerging Patterns of Federalism."

rather what mix of government participation is optimal. The spatial distribution of benefits, possible economies of scale, and, in practice, a number of political variables must jointly serve to provide the answer to this question.

Summary and conclusions

The central thesis of this paper is that, in a federal system, the Distribution and Stabilization branches of the public fiscal department must perform their functions primarily at the central-government level. In contrast, in the Allocation Branch, local government, as well as the central government, has important responsibilities in the provision of needed public goods and services.[42]

1. In the Stabilization Branch, the effective use of an independent fiscal policy by local governments is seriously constrained by the openness of the community, which implies a small conventional multiplier, by restrictive balance-of-payment forces, and by the growth of external indebtedness in response to deficit-financed expenditures. Furthermore, since in a federation cyclical fluctuations are generally of a nationwide character, it is essential that there be a centrally planned and directed compensatory policy.

2. In the Distribution Branch, the mobility of economic units generally places stringent restrictions on the capabilities of local governments to alter the existing distribution of income. Attempts, for example, by a local government to institute a more equal distribution of income tend to result in a movement of the wealthy out of the community. Furthermore, the achievement of horizontal equity in a federal system implies either intercommunity transfers or a discriminating central-government income tax. Thus, the central government must in the main assume responsibility for maintaining the "optimal" distribution of income.

3. In the Allocation Branch, the responsiveness of local government to community needs and the desirability of providing consumers with a wide choice of "fiscal packages" suggest an important role for government at the local level. In our "ideal" model, the central government provides the efficient output of the national public good, while numerous local governments offer individuals a wide variety of output of the local public good.

(a) The existence of spill-over benefits and costs between communities indicate a need for central-government policies to correct for the resulting inefficiencies in resource allocation.

(b) The problem of efficiency in taxation has added dimensions in a federal system. As a consequence, community co-ordination to "harmonize" local tax structures is needed to keep inefficiencies from becoming excessive.

(c) In a more complicated system with many levels of government and a detailed menu of public goods and services, compromises as between the spatial character of spill-over effects and possible economies of scale are inevitable in determining the optimal *mix* of government participation in providing a particular good or service.

[42]Musgrave reaches a similar conclusion in his treatment of the problem in *The Theory of Public Finance*, 181–2.

[Footnotes]

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