Reassessment of the Tiebout model
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1. Introduction

The classical approach to fiscal federalism associated with the seminal works of Musgrave (1959) and Oates (1972) owes much to Tiebout’s (1956) ‘pure theory of local expenditure’. Tiebout’s paper originated as a response to the inability of a market economy to resolve the free-rider problem of public goods. Tiebout proposed a model whereby consumer–voters’ preferences for public goods were revealed through exit rather than voice. Mobile consumers, faced with a choice of communities offering different mixes of local public goods or services, would choose their most preferred, thereby revealing their preferences. Local governments would compete for households by their choice of fiscal packages. The process would lead to an optimal allocation of households among communities, with each household paying a tax commensurate with their benefit from public services.

The focus of this paper is on the impact and relevance of the Tiebout approach for modern fiscal federalism. While Tiebout’s stylized view of the world embedded many strong assumptions and was meant to apply to local public goods provision, elements of it were adopted by the early fiscal federalism literature and have had a lasting influence. Among the most important were the emphasis on household mobility, the fiscal heterogeneity of different communities, the beneficial effects of fiscal competition, and benefit taxation as both the consequence and the ideal of local government finance. Our purpose is to assess the continuing importance of these features for fiscal federalism.

To limit our scope, we restrict attention to federal and state governments. There is little doubt that aspects of the Tiebout approach remain highly relevant to the study of local governments. Community sorting and the responsiveness of local services, such as education, law enforcement and public safety regulation, to community preferences are relevant features of local governments (Calabrese et al., 2006). Benefit taxation continues to be a suitable ideal of local government finance, and competition among localities is vibrant. The legacy of the Tiebout model for local government outcomes have been amply summarized in Berglas and Pines (1981), Epple and Zelenitz (1981), Mieszkowski and Zodrow (1989) and Scotchmer (2002). We shall argue, however, that, although the Tiebout approach influenced early models of federal-state fiscal federalism, the principles and practice of federalism have evolved and superseded some key features of the approach. We discuss these principles in detail later in the paper.

Some institutional differences between fiscal federalism models and the Tiebout model should be emphasized. Fiscal federalism is concerned with outcomes in models with more than one level of legislatively autonomous government. There is no upper level of government in Tiebout’s setting, nor is there any particular role for legislator–autonomous government. There is no upper level of concern with outcomes in models with more than one level of taxation, and the advantages of fiscal federalism associated with the Tiebout model should be emphasized. Fiscal federalism is inspired ones.

Fiscal federalism at the state level.

A B S T R A C T

The Tiebout model has been the reference point for the classical approach to fiscal federalism. Its emphasis on mobility, benefit taxation, and the advantages of fiscal competition have informed fiscal federalism since the seminal contributions of Musgrave and Oates. This paper reviews the influence that the Tiebout model has had on fiscal federalism, and argues that while its insights remain relevant for local government, it is far from compelling as a positive description of, or a normative prescription for, fiscal federalism at the state level. Some aspects of alternative approaches are presented, which lead to different perspectives than Tiebout-inspired ones.

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The stylized facts of federations also differ from the world of local governments envisaged by Tiebout. Households are not perfectly mobile among states, especially in federations with a small number of large states. This dilutes the competition for households that motivated Tiebout’s analysis, and replaces it with competition for capital and businesses. There are probably more similarities than differences in the mix of public goods and services provided by different state governments. In most federations, states are responsible for substantial items such as education, health and welfare services, and provide them at comparable levels. Not only are these unlike the state and local public goods that the traditional literature assumes are provided by sub-national governments, they are also expenditures that have important redistributive consequences, largely by intent, and that are probably more like publicly provided private goods than local public goods. This, combined with heterogeneous state populations, implies that state tax systems cannot easily be characterized as benefit taxation. Modern federations also exhibit varying degrees of vertical fiscal gaps whereby the federal government raises more revenue than it needs and transfers the excess to states. Why such grants exist and what form they should take are major pre-occupations of modern fiscal federalism.

Given these differences, what insights from Tiebout’s original contribution still inform our understanding of fiscal federalism? To address this, it is useful to recall what Musgrave (1959) called two alternative approaches to federalism (pp. 179–83). In ‘pure federalism’, the role of states was to provide public goods that benefit persons within their boundaries. Federalism permitted groups in different states to express different preferences for public goods. Equal treatment of equals would apply within states, but not nationwide. The federal government would be responsible for distribution and stabilization, and would use grants to internalize interstate spillovers. In Musgrave’s ‘different view of federalism’, states also provide social wants, such as education and social services. The principle of equal treatment of equals applies nationwide and requires, following Buchanan (1950), the equalization of fiscal residua — roughly, the difference between the value of public services and tax payments for each household — across states. As well, earmarked grants should be used to ensure that citizens enjoy minimum standards of these social wants. These two approaches to federalism parallel what we refer to as Tiebout-inspired approaches and alternative approaches. Before discussing these two approaches, we first review the main elements of the Tiebout model.

In the original Tiebout model, a population of households with different incomes and preferences are perfectly mobile among many communities, and take their incomes with them. There is a variable number of communities, each one offering a mix of congested local public goods and head taxes. Given the level of public goods provided, there is a population level that minimizes per capita public good costs, and that defines the optimal population for the locality. Local managers compete for households to achieve optimal populations by offering a public good and tax mix that will attract the optimal population. Households choose the locality they most prefer, and an equilibrium is imagined in which households sort across communities according to their most preferred tax—expenditure mix. The outcome of this competition for households is supposed to be an efficient allocation of households across localities, with an optimal number of households and an optimal size of local public goods in each. Benefit pricing applies in the sense that the head tax that each resident pays equals the value of benefits received from the local public goods.

Tiebout recognized that his model was a caricature of reality, though no more so than the model of perfect competition was for private goods. It was designed to make a point and clearly succeeded. Nonetheless, even as a model of local government behavior, there are some problems. Tiebout meant his model to be a response to the free-rider problem that prevented markets from achieving optimality. Exactly how local politicians overcome the preference revelation problem is not spelled out, although there is a presumption that the city manager ‘follows the preferences of the older residents of the community’ (p. 419). Apart from the choice of persons to locate in the community most suited to their preferences, there is little discussion of the decision-making of other actors, particularly the local governments who are deciding on quantities of local public goods and their financing. Even the local government’s objective function is not made explicit, although later literature emphasized land-value maximization as suitable (Brueckner, 1983). What is discussed as the consequence of perfect mobility is a final equilibrium that is presumed to be consistent with the assumptions made. The process by which that equilibrium occurs is not provided.

The exogeneity of incomes is also a well-known limitation. Effectively, Tiebout’s model is one of the competitive provision of club goods, which we now know leads to efficiency (Scotchmer, 2002). Adding a production sector in which incomes are dependent on location complicates matters considerably, and in some models efficiency survives. For example, it may lead to heterogeneous communities if different types of labor are complementary in production, but efficient sorting still applies (Berglas and Pines, 1981).

A variable number of communities is critical for optimality in the Tiebout model. This allows there to be enough communities such that, given the total population, all communities are optimally populated. The meaning of optimal population is somewhat ambiguous when there are many public goods, each one of which supports a different optimal population. Moreover, if communities are heterogeneous, the ability to implement benefit-related head taxes is suspect (although Hamilton (1976) has shown that property taxes may function as benefit taxes when combined with zoning).

In somewhat more realistic local public goods settings, stability, existence and efficiency of Tiebout-type competition among local governments are not guaranteed. As Bewley (1981) shows in a setting with a relatively small number of communities, migration equilibria may be inefficient since there is no market mechanism to coordinate the location decisions of individuals. Likewise, nothing guarantees that households with similar preferences will locate in the same communities, so the benefits of community sorting may not be realized. Wheaton (1975) and Bewley (1981) considered different settings in which an equilibrium may not even exist. If income taxes are used to finance local public goods, there may be no allocation of households across communities in which none have an incentive to move to a different community.

2. Tiebout-inspired approaches to fiscal federalism

Traditional models of fiscal federalism adopted various assumptions from Tiebout with respect to state governments, and added a federal government with its own assigned tasks. We discuss a series of these assumptions, starting with the assignment of fiscal functions to levels of government.

2.1. The assignment problem

The classical view of what tasks to assign to federal and state governments was part of the original statement of the fiscal federalism problem by Musgrave (1959) and Oates (1972). Their view of the assignment of expenditure and revenue-raising was inspired by Tiebout. With respect to expenditures, states should be assigned the provision of state public goods whose benefits accrued mainly within state borders, although perfect assignment was not possible so spillover benefits were inevitable. State governments would provide appropriate levels of state public goods to satisfy the needs and preferences of their residents. In principle, the federal government could do so as well, but for political and informational reasons it would provide a common level across states. This is Oates’
Decentralization Theorem, a precursor of the principle of subsidiarity adopted by the European Union. As Oates (1999) emphasized, it applies whether households are mobile or not, since in either case, there is a presumption that preferences will differ across states.

The Decentralization Theorem and the model underlying it have had surprising staying power, given its simplistic view of the assignment of expenditures in a federation. Analytical models of fiscal federalism typically take it for granted that state governments provide state public goods, albeit sometimes congested ones. Examples include models of labor mobility (Buchanan and Goetz, 1972; Flatters et al., 1974; Gordon, 1983; Albouy, 2009), models of fiscal competition (Wilson, 1986; Zodrow and Mrozowski, 1986; Keen and Marchand, 1997), models of vertical interaction (Roadway and Keen, 1996; Keen, 1998; Keen and Kotsogiannis, 2002; Roadway and Tremblay, 2006), and models of interregional insurance (Persson and Tabellini, 1996; Lockwood, 1999). Recently, the Decentralization Theorem has been re-visited using political economy approaches (Besley and Coate, 2003; Lockwood, 2002). In these, the federal government provides different levels of public goods across states, but the allocations are determined by political economy rather than normative considerations.

The assumption that state expenditures are on state public goods has been the standard approach to the assignment problem. It relies on differences in preferences among state residents as the main argument for the decentralization of spending responsibilities. As we mentioned, this way of conceptualizing the assignment problem is not entirely compelling. The bulk of state public expenditures in most federations are on quasi-private goods and services and on targeted transfers rather than on state public goods, which leads to somewhat different arguments for decentralization, as we discuss later.

The traditional approach, which owes much to Musgrave’s well-known distinction between the Allocation, Distribution and Stabilization branches of government, also assigns redistribution and stabilization to the federal government. Stabilization is relatively non-controversial, although state government budgets do have macroeconomic consequences, sometimes intentionally and sometimes pro-cyclically (Poterba, 1994). The arguments for assigning redistribution to the federal level are less clearcut. One is that in a world with mobile households, redistribution will be competed down by state governments (Oates, 1999; Wildasin, 1991). Another is that individuals ought to be treated the same for redistributive purposes no matter where they live, so that a common national standard of equity should apply (Musgrave, 1959). This argument has played an important role in the equalization literature as will be seen later. A consequence of this view is that benefit taxes should be used by state (and local) governments (McLure, 2001). On these grounds, residence-based taxes are preferable to source-based taxes, and property taxation on residents is a particularly attractive state and local tax base. As well, user fees are like benefit taxes. This argument for benefit taxation has particular force in a Tiebout setting in which households are highly mobile and sort among communities by preferences. Since efficient benefit taxes are equal to the marginal cost of providing public goods, they can also be seen as congestion fees.

The notion that state governments should play no redistributive role and should use benefit taxes is not compelling on various grounds. For one thing, since state populations are typically heterogeneous, benefit taxation is not feasible, as the literature on the Lindahl equilibrium has taught us. More important and as mentioned, a substantial proportion of state spending is on quasi-private goods such as education, health care and social services that are inherently redistributive. It would defeat the purposes of these programs if they were financed using benefit taxation. (Why these public services are decentralized to state governments raises issues about the principles of assignment in a federation to which we return in the next section.) Furthermore, given the size of state government expenditures, significant sources of revenue must be obtained to finance them. If one presumes that states should raise a substantial part of their own revenues, they need access to at least one broad-based revenue source, such as income taxation, general sales taxation or payroll taxation. It would be exceedingly difficult to design those taxes according to the benefit principle.

There are also theoretical arguments for decentralizing some redistribution to the state. Pauly (1973) argued that income redistribution is in part like a local public good. To the extent that altruism applies with more force to those living nearby, efficiency can be fostered by some local redistribution, which internalizes the externalities associated with local altruism. More recently, the optimal income tax literature, specifically the tagging sub-component of that literature, has suggested that redistribution can be more effectively achieved if the population can be disaggregated into identifiable groups with different distributions of incomes in each (Immonen et al., 1998). The state of residence might be such a grouping. In those circumstances, redistribution might be improved if it were decentralized to the state level, possibly accompanied by interstate transfers (Roadway et al., 1998; Gordon and Cullen, 2010).

To the extent that state governments do not use benefit taxation, there are potentially strong implications for the system of federal-state transfers. Most federations, the USA being an exception, deploy systems of equalization transfers among states with differing fiscal capacities. As discussed below, one rationale for these equalization transfers relies on the redistributive features of state fiscal systems.

2.2. Labor mobility in fiscal federalism

An important influence of Tiebout’s model on the fiscal federalism literature has been its emphasis on labor mobility. In Tiebout (1956), households took their given incomes with them when they moved. Optimal community sizes applied when the benefits of having more residents to share the costs of public goods just offset the congestion costs imposed by adding more users to the local public good. This, combined with an endogenous number of communities ensured that households were allocated efficiently among communities, regardless of whether household preferences for public goods differed. Models of fiscal federalism with mobility change these assumptions in two realistic ways. First, incomes are endogenously determined by a production technology that exhibits decreasing returns to labor in each state, say, because of a fixed factor like land. Second, the number of states is fixed. In this setting, even if households are identical, mobility among states will generally lead to an inefficient allocation of population.

The original insight that mobility is inefficient in a federation was due to Buchanan (1952) and Buchanan and Goetz (1972), and was elaborated in various ways by Flatters et al. (1974), Stiglitz (1977), Roadway and Flatters (1982), and Gordon (1983), and more recently by Albouy (2009). The exact form of the argument depends on the assumptions made. Consider the simple case studied by Flatters et al. There are two states, one with strictly concave and increasing production functions \( F(L_i) \), where \( L_i \) is the population in state \( i \). Total population \( L = L_1 + L_2 \) moves freely across states. State production can be divided between a state public good, \( G \), and a private good, \( X \), so \( F(L_i) = G_i + L_iX_i \). State governments choose their policies first followed by household migration decisions, so that migration responds to fiscal decisions. This is the usual timing assumption in this literature. Households have identical utility functions \( U(X,G) \) and, given state fiscal decisions, allocate themselves between states such that, assuming an interior solution, \( U(X,G_i) = U(X,G_j) \).

Population has conflicting effects on per capita utility. An increase in population reduces per capita output because of diminishing returns to labor, but enables more sharing of the costs of providing the public good. The allocation of resources that maximizes per capita utility satisfies two conditions. One is the Samuelson condition, \( L_iU_i(X,G_i)/U_i(X,G_j) = 1 \), which determines the optimal division of
output between private and public goods in each state. The second is the condition for the optimal allocation of population between the two states, \( F(L_1) - X_1 = F(L_2) - X_2 \). Intuitively, additional residents contribute to output their marginal product and use resources equal to their consumption of the public good. No cost is associated with their consumption of the public good. Generally \( X_1 \neq X_2 \) since the state with larger population will have higher \( G \) and thus lower \( X \). If population is optimal in the federation as a whole, \( F(L_1) - X_1 = 0 \), and per capita utility is maximized across the federation. \(^1\) Otherwise, the federation will be under-populated if \( F(L_1) > X_1 \), and vice versa.

At stake is whether decentralized state decision-making results in an optimal resource allocation. Consider the case where state with larger population will have higher per capita utility is maximized across the federation. \(^2\) Otherwise, the demand for the public good is unity and states satisfy the Samuelson condition. Note suggested public good. Let \( G_i \) be the case. \(^2\) Intuitively, \( T_i \) is the fiscal externality that a migrant contributes to other citizens when moving to state \( i \).

This result can be generalized slightly by allowing \( G \) to be a con- gested public good. Let \( g_i = G_i/l_i^\alpha \) be the services obtained from \( G_i \), so utility can be written \( U(X_i, g_i) \). Then, \( \alpha G_i/l_i \) can be interpreted as the marginal congestion cost an additional resident imposes on existing residents. It is the change in resources required to keep \( g_i \) constant when \( L_i \) increases (since \( G_i = l_i^\alpha g_i \), \( \partial G_i/\partial L_i = \alpha g_i/l_i \)). The condition for the optimal allocation of population can then be written as \( F(L_1) - X_1 - \alpha G_i/l_i = F(L_2) - X_2 - \alpha G_2/l_2 \), or under the assumptions made above, \( T_i - \alpha G_i/l_i = T_2 - \alpha G_2/l_2 \) (Buchanan and Gottz, 1972).

Further insight can be obtained by using the state budget constraint \( G_i = l_i T_i + R_i(L_i) \), where we still assume that the states obtain the rents from state production. Then, since \( R_i(L_i) = F_i(L_i) - L_i F_i(L_i) \), the optimal migration condition can be written as:

\[
\frac{(1-\alpha)G_1}{l_1} - \frac{R_i(L_1)}{l_1} = \frac{(1-\alpha)G_2}{l_2} - \frac{R_i(L_2)}{l_2} \quad (1)
\]

If \( \alpha = 1 \), so \( g_i = G_i/l_i \) and \( G_i \) is a private good provided by the public sector, optimal migration requires that per capita rents be the same in both states. Differences in per capita rents induce inefficient migration. If the rents are owned by absentee landlords whose utility does not count, an efficient labor allocation will occur when \( \alpha = 1 \). On the other hand, if \( \alpha = 0 \) so \( G \) is a pure public good, the absence of rent taxation again implies that \( G_i/l_i = T_i \) should be equalized across states, which will not generally be the case.

The failure of free migration to ensure an efficient population allocation across states forms the classic argument for unconditional equalization transfers. A transfer from one state to the other will induce a change in the allocation of labor, so can be used to correct the migration inefficiency. In the case just considered, the optimal transfer from state 1 to state 2, denoted \( S_2(= - S_1) \) is given by (Boadway and Flatters, 1982):

\[
S_2 = \frac{l_1 l_2}{l_1 + l_2} \left( \frac{(1-\alpha)G_2}{l_2} - \frac{(1-\alpha)G_1}{l_1} \right) + \left( \frac{R_i(L_1)}{l_1} - \frac{R_i(L_2)}{l_2} \right) \geq 0 \quad (2)
\]

According to the second term in square brackets, equalization grants should equalize per capita rents accruing to state governments. This term disappears to the extent that rents are not taxed, or are capitalized into local land values. For the first term, suppose \( \alpha = 0 \) so \( G_i \) is a pure public good. Then, per capita shares of financing the public good should be equalized, and this term disappears as \( \alpha \) goes to unity. Albury (2009) has generalized this analysis to allow for individuals of different skills who migrate freely among states, but whose skills are imperfect substitutes in production. State taxes include proportional income taxes as well as source-based taxes on capital income and rents. Migration is generally inefficient. Source-based taxes generate fiscally-induced migration, and standard fiscal externalities of migration apply. An equalization formula like Eq. (2) that equalizes all source-based tax differences applies.\(^3\)

The inefficiency of migration does not stop there. As Stiglitz (1977) shows, migration equilibrium may not be unique. Moreover, if the federation is under-populated, the only stable equilibrium may be a corner solution with all households going to a given state. In this case, an interior migration equilibrium is unstable, so out of that equilibrium, population goes entirely to one state. This is not surprising, given the unexploited agglomeration economies when the population is low. The state in which population agglomerates might be the wrong one, in the sense that per capita utility would be higher if population were in the other state.

These results on the inefficiency of migration are pessimistic. However, the Tiebout assumption of free migration is not realistic. Models with costly migration avoid some of the problems, especially instability. However, they do not avoid the general inefficiency of migration. In addition, once migration costs apply, households will end up with different levels of utility, and equity issues arise. We return to that below.

An efficient allocation of labor is only one condition required for optimality in our simple federation. The Samuelson condition characterizing the optimal division of output between public and private goods in each state must also be satisfied. Here, the literature is more optimistic. Suppose state governments behave non-cooperatively and recognize that migration equilibrium must be satisfied. If local governments finance public goods by a head tax, they will choose \( G_i \) according to the Samuelson condition (Boadway, 1982). The equality-condition of free migration implies that states that maximize the per capita utility of their residents will also maximize per capita utility nationwide, referred to as ‘incentive equivalence’ (Myers and Papageorgiou, 1993).\(^4\) This is so whether the federation is under- or over-populated.

This has some relevant implications. When states use a head tax to finance the state public good, the benefit pricing solution applies as in Tiebout. This implies that states do not compete inefficiently for labor, even if the federation is under-populated so that per capita incomes of their residents would rise with an inflow of labor. In that sense, tax competition does not apply with mobile labor in the way it does with capital or commodity trade. Still, the allocation of labor will generally be inefficient, as mentioned above.\(^5\) These results also generalize to the case where state public goods are subject to congestion, so a modified Samuelson condition applies of the form

\[
L_i^G U(\nu X_i G_i) / U(\nu X_i G_i) = 1
\]

If states have access to other tax instruments, non-optimal policies might be chosen. For example, if the non-labor resources

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\(^1\) Some have emphasized the so-called Henry George Rule when population is optimal (Mieszczon and Zodrow, 1989). Rents in state \( i \) are \( R_i = F_i - l_i F_i \). Using \( F_i = G_i + L_k X_i \) we obtain \( R_i = G_i \). That is, public goods can just be financed by fully taxing rents, reminiscent of the land tax proposed by George (1914). Without optimal population, sole reliance on rent taxation will be inefficient, so we do not emphasize this rule.

\(^2\) As Flatters et al. (1974) show, \( T_1 = T_2 \) if the compensated price elasticity of demand for the public good is unity and states satisfy the Samuelson condition. Note that \( T_1, T_2 \) as the federation is under- or over-populated.

\(^3\) Formal migration equilibrium requires that \( U(F_i(L_i) - G_i/l_i G_i) = U(F_i(L_i) - G_i/l_i G_i) \), which yields \( l_i G_i = G_i \). Given \( l_i = 0 \). State 1 chooses \( G_i \) to maximize per capita utility taking account of \( l_i G_i \) and given \( G_i \). This is equivalent to choosing \( G_i \) and \( l_i \) to maximize \( U(F_i(L_i) - G_i/l_i G_i) \) subject to the equality condition, which makes incentive equivalence apparent.

\(^4\) Note that the inefficiency of migration does not apply if population is optimal for the federation and states have access to rent taxes. In this case, the Henry George Rule applies so \( T_1 = T_2 = 0 \) and the migration externality disappears. This is clearly not the Tiebout result since benefit taxes are not used.
(natural resources, capital, land) in a state are owned by non-residents, taxing them using source-based taxes might lead to tax exporting since non-resident owners are made to pay for state expenditures. To the extent that such tax exporting does occur, states will have a tendency to provide excessive levels of public goods (McLure, 1967). However, this assumes that source-based taxes are not shifted back to residents. In the case of capital, if it is mobile, taxes on it will only be borne by non-residents to the extent that the tax is unanticipated. Otherwise, it is simply shifted back to domestic factors of production. Similarly, in the case of land or natural resources, taxes that are anticipated will be capitalized into their price and ultimately will be borne by the original owners, who themselves may be residents (Feldstein, 1977).

2.3. Fiscal competition

One of the messages of the Tiebout model was the presumed beneficial effect of fiscal competition. Competition among communities for mobile households, along with endogenous community formation, led to an efficient supply of public goods and an efficient allocation of population. In contrast, and partly in response to Tiebout’s analysis, there has been much literature focusing on how fiscal competition can distort government decisions as well as the allocation of production factors across states. Most of this literature, surveyed by Wilson (1999), has been concerned with the mobility of capital and firms rather than households.

In the standard capital tax competition models proposed by Wilson (1986) and Zodrow and Mieszkowski (1986), capital is perfectly mobile and states provide public goods to their residents financed by a source-based capital tax. The stock of capital is fixed and states behave competitively, taking the net return to capital as given. An increase in the tax rate of one state leads to an outflow of capital which raises the tax base and the tax revenues in other states. Since states do not take into account the positive fiscal externalities of an increase in their tax rate on the revenues of other states, they set inefficiently low tax rates. In symmetric models where states are identical initially, they set the same tax rates in equilibrium, so the equilibrium allocation of capital is not distorted. However, all tax rates, and thus public goods’ levels, are inefficiently low, so tax competition reduces welfare in all states. Tax coordination, or some corrective policies from the federal government, can be welfare-improving.

When states differ in population, preferences or production technologies, equilibrium tax policies differ across states leading to an inefficient allocation of capital (Bucovetsky, 1991; Wilson, 1991; Burbidge and Cuff, 2005). Bucovetsky (1991) and Wilson (1991) characterize tax competition equilibria where states differ in population sizes and find that smaller states tend to set lower tax rates and attract more capital per unit of labor. With large differences in the sizes of states, tax competition may increase welfare in small states.

Keen and Marchand (1997) extend the basic tax competition model to examine how states may distort the composition of public expenditures to attract mobile capital. They consider a model where governments provide both consumption public goods and production public goods. If production public goods and capital are complements in production, the mobility of capital will induce governments to over-produce public goods relative to consumption public goods. In effect, while taxes on capital discourage capital from locating in the state, this is mitigated if the revenues are used for production public goods which enhance the productivity of capital. Both tax coordination and expenditure coordination can be welfare-improving.

Fiscal competition also arises when governments use commodity taxes and consumers engage in cross-border shopping (Mintz and Tulkens, 1986; Kanbur and Keen, 1993; Lockwood, 1993). Two forms of fiscal externalities can occur in this case. An increase in the commodity tax rate in a state whose residents’ cross-border shop in neighboring states will induce an increase in cross-border shopping, reducing tax revenues in the taxing state and increasing them elsewhere. This tax-competition effect will cause tax rates to be too low. For states in which residents from another state cross-border shop, an increase in the tax rate will increase tax payments by non-residents, even though it reduces cross-border purchases. This tax exporting will provide an incentive to set tax rates too high. The net effect depends on the specific circumstances. In Kanbur and Keen (1993), there are two neighboring states of different sizes. In a Nash equilibrium, the tax rate in the smaller state undershoots that in the larger state, causing cross-border shopping to go from the larger to the smaller state. As with capital tax competition and expenditure competition, this form of fiscal competition is generally welfare-reducing. However, if the small state is small enough, it can be made better off at the expense of the larger state.

The standard analysis assumes that state governments are benevolent, in which case tax competition tends to reduce social welfare. If they are not benevolent, tax competition can be beneficial by constraining the self-interested behavior of political decision-makers. Edwards and Keen (1996) study the extreme case of state governments behaving as revenue-maximizing Leviathans, following Brennan and Buchanan (1980). In this case, competition for mobile capital mitigates the tendency of governments to set inefficiently high taxes. On balance, tax competition can make households better-off. Capital mobility may also induce welfare-improving expenditure competition if the provision of public inputs affects the location of capital. Wilson (2005) studies this in a model where self-interested bureaucrats are maximizing the surplus between tax revenues and public input spending. A similar phenomenon occurs where governments, even if benevolent, cannot commit to future tax policies. In particular, even benevolent state governments will set capital tax rates too high in an attempt to tax the quasi-rents of accumulated capital. In these circumstances, tax competition can mitigate the time-inconsistency problem and improve welfare (Keoh, 1989). The over-taxation of capital can also be mitigated, and possibly reversed, if industries that rely more heavily on sunk capital have greater incentives to lobby for preferential tax treatment (Marceau and Smart, 2003).

There are also circumstances in which competition between governments for mobile capital, or firms, can lead to fully efficient outcomes. For example, White (1975) examined a setting where mobile firms choose where to locate among communities offering different levels of public services. The ability of communities to restrict entry through zoning regulation, as well as competition for firms, leads to an equilibrium where property taxes are equivalent to benefit taxes on firms. In a similar setting where local governments provide public inputs that increase the marginal product of capital, Oates and Schwab (1991) show that competition for mobile capital will lead to an efficient outcome as long as governments impose benefit taxes. If the taxes on capital are equal to the benefits derived from the public inputs, capital and public inputs will be used efficiently and the marginal product of capital will be equalized across jurisdictions.

In models where there is both household and capital mobility, there are benefits from Tiebout sorting and distortions generated by capital tax competition. Overall, fiscal competition may increase or decrease welfare. Brueckner (2000) considers a model of capital tax competition where households sort across communities on the basis of preferences for public goods, and he examines whether the welfare benefits of Tiebout competition dominate the welfare cost of capital tax competition. He finds that communities with high demand for public goods set high tax rates and high public good supply, but have low capital stocks and wages. As a result, high-demand communities are made worse-off by capital tax competition, contrary to the case where governments use only head taxes, while low-demand communities may be better- or worse-off.
2.4. Intergovernmental grants

In the classical approach to fiscal federalism, intergovernmental grants serve three main purposes. First, they can be Pigouian-type subsidies to internalize interstate spillovers (Oates, 1972; Gordon, 1983; Dahlby, 1996). These would be open-ended matching grants, with the matching rate reflecting the size of the externality. This view of conditional transfers is relatively ambitious, and does not do justice to the type of conditional grants that are common in many federations. It is ambitious because it presumes that the magnitude of spillovers could be known with enough precision to inform the size of the matching rate. In fact, the matching rates that one observes in practice — often one-for-one — seem to be higher relative to the presumed size of interstate spillovers. As well, federal–state grants are often either closed-ended or bloc conditional grants that have no matching component. Although this form of grant is hard to justify on spillover grounds, there are other reasons that might support them to which we return below.

A second traditional argument for federal–state transfers is to close a vertical fiscal gap that is presumed to reflect differences between the desired level of state expenditure and revenue-raising responsibilities. This calls for unconditional transfers, which make up a significant proportion of transfers in most federations. The possibility of a vertical fiscal gap being desirable (over and above that required to deal with spillovers) belies the Tiebout model where taxes reflect the benefits of public services so should be sufficient for meeting revenue needs. The standard argument is that the case for decentralizing expenditures is greater than for decentralizing revenues. There is much consensus among federations about the sorts of expenditure programs that are best delivered by the states, and this typically results in spending levels comparable to the federal government. For states to be self-sufficient would involve them having access to substantial shares of major revenue sources. Given the potential for non-harmonized taxes, as well as the efficiency and equity consequences of decentralization of revenue-raising, most federations have opted for much more centralized revenues than expenditures. In fact, the fiscal gap varies considerably across federations, mostly due to differences in revenue decentralization.

This fiscal gap argument for federal transfers is not completely convincing. It is just as likely that the argument goes in the other direction, that is, that the size of the fiscal gap is primarily determined by federal–state transfers having a role to play in their own right. One such role is to influence the behavior of the states — for example, to induce them to initiate certain expenditure programs — a role that has become prominent in more recent literature on fiscal federalism. Another role is equalization, the third role of grants in the classical approach. Almost all federations have formal systems of equalizing transfers whose allocation is based on some measure of state fiscal capacity, usually the amount of revenue that a state would raise by applying a reference tax rate to its tax base. Some have formal institutions for advising the federal government on allocating equalization transfers (Australia, India, and South Africa). We saw above that in a world with mobile labor, equalization transfers can in principle negate fiscal externalities of migration. Given the limited extent of migration in practice, this is an unlikely explanation for the size of equalization transfers we see in practice. Alternative approaches to fiscal federalism to which we now turn provide a different rationale for both equalization transfers and bloc conditional transfers.

3. Alternative approaches to fiscal federalism

The study of fiscal federalism has taken on renewed urgency. Many countries have been, or are, decentralizing legislative and fiscal responsibilities to sub-national governments. These include developing countries, like Indonesia, Iraq, Kenya, Nepal and South Africa; transitional economies, like Russia; and OECD countries, like Spain, Belgium and the UK. As well, existing federations are going through varying degrees of reform of their federal systems to improve public service delivery, make tax systems more efficient, improve accountability and governance, and simply react to new circumstances. This has been the case in Australia, Canada, China, Germany and to some extent the USA and Latin American federations. The issue of intergovernmental fiscal relations remains an ongoing concern in established federations, like India, Nigeria and Pakistan. Even in many unitary states like Japan, the Scandinavian countries and the UK, fiscal relations between the central government and local governments have undergone some streamlining. The principles and practices of fiscal federalism have also informed the design of fiscal relations in economic unions, such as the European Union, the Gulf Cooperation Council and Mercosur.

There are a number of issues of common concern to modern federations. One is the extent and form of decentralization. Typically, the status quo position is a centralized situation, so the issue of concern is how much to decentralize. In some cases, the approach is bottom-up, as with economic unions. At the other extreme, there are concerns about the break-up of existing nations, such as the former nations of Czechoslovakia, the original Pakistan, the USSR, and Yugoslavia, as well as nations where break-up has threatened, such as Belgium, Canada, Nigeria, Spain and Sri Lanka. There are even cases where separate regions contemplate joining to become a federation, such as Cyprus and, more successfully, Germany. Another issue is the form of federal–state fiscal relations, especially the system of grants. These have undergone significant reform in many countries. A third issue is the harmonization of policies among states, including tax structures, internal trade and investment, cross-border spillovers and procurement. Finally, there is the issue of fiscal stabilization in response to idiosyncratic regional shocks and aggregate national shocks.

The literature that complements these developments draws some elements from the Tiebout tradition. But, the emphasis is generally quite different and in some ways contradictory to the Tiebout approach. What follows is a summary of some of the key elements of the alternative approach, some of which we have hinted at above already. A detailed, non-technical treatment can be found in Broadway and Shah (2009).

3.1. Limited mobility

Mobility of households plays a limited role in modern analyses of fiscal federalism. This is in large part because migration is a costly decision, both in terms of material costs, such as the cost of changing houses and employment, and in terms of non-pecuniary costs, such as the loss of social capital and circles of friendship. These costs are less for younger and more skilled persons than for others. It is also in part due to the fact that migration is a long-term decision and not one that responds to year-to-year policy changes. Fiscal federalism approaches often make the simplifying assumption that labor is immobile, thereby eliminating one of the key elements of Tiebout competition. Alternatively, the very long-run nature of migration can be taken to imply a change in the order of events. Instead of migration responding to state policies as in Tiebout-type models, migration can be thought of as occurring before state policies are implemented. To the extent that potential migrants anticipate future policies, as one would assume when sub-game perfection is being used as an equilibrium concept, outcomes can be quite different than those in the standard approaches. Consider the consequences of these two approaches in turn.

3.1.1. Fiscal federalism with immobile households

If households are completely immobile, the mechanism for sorting by preferences no longer applies. Instead, emphasis has been put on
the fact that utilities for persons of a given earnings capacity are no longer equalized across states. Persons of similar types who reside in different states will be treated differently in the taxes and public services they face. Following Buchanan (1950), this can be thought of as violating horizontal equity in the sense that otherwise identical persons are treated differently by state and federal governments combined. To the extent that horizontal equity, or fiscal equity as Buchanan called it, is a societal objective, it can be addressed by federal–state equalization transfers. There is a sizable literature on the design of equalization transfers for this purpose, and we can provide only a brief summary here.6

Start with a simple benchmark case that draws on Buchanan (1950). Suppose that two states, 1 and 2, contain populations with different distributions of income, where average incomes, \( \bar{Y}_1, \bar{Y}_2 \), differ across the two states. The state governments provide a quasi-private good \( g_i \) in equal per capita amounts to all residents, and finance it with a proportional income tax at the rate \( t_i \). Define the net fiscal benefit (NFB) of a person with income \( Y^i \) in state \( i \) as \( g_i - t_i Y^i \), the difference between the amount of the public good and its tax cost. Suppose the tax rate is the same across states. Since \( g_i = \bar{Y}_i \) by the government budget, the NFB for this person in state \( i \) is \( t_i (\bar{Y}_i - Y^i) \), so the difference in NFBs across states is \( t_i (\bar{Y}_2 - \bar{Y}_1) \). This is the same for all income types, and reflects the relative benefit of living in a higher-income state. An equalization transfer based on differences in per capita tax collections would undo NFB differences. The transfer from state 1 to state 2 takes a form analogous to Eq. (2):

\[
S_2 = \frac{L_1 L_2}{L_1 + L_2} t (\bar{Y}_1 - \bar{Y}_2)
\]

If the states had the same objective function, in the post-equalization outcome they would choose the same tax rates and provide the same levels of the quasi-private good.

This example is very special, and before we generalize it, it is worth emphasizing how it differs from the Tiebout outcome. For one thing, differences in preferences are suppressed. The presumption is that if states had the same fiscal capacity they would provide comparable levels of public services to their residents. For another, the equalization remedy being proposed is that differences in residence-based taxes should be fully equalized. In a model with free migration, the case for equalizing residence-based taxes disappears, as Albouy (2009) has shown: free migration undoes differences in average incomes across states. Put differently, horizontal equity is not a concern under free migration, since households of a given type can migrate until they are equally well-off wherever they reside. As well, the case for equalization of residence-based taxes would disappear if all individuals’ taxes equaled the level of public services they consumed, even if there were no mobility of households and differences in average income prevailed.

The above example illustrates the intuition of the argument for equalizing residence-based taxes. The logic can be applied to more realistic settings. Other residence-based taxes also give rise to NFB differences, such as state sales and payroll taxes. To the extent that they are proportional, the same argument as in the example applies. If the income tax is progressive and the rate structure is piecewise linear, equalization transfers could be based on differences in per capita incomes within each tax bracket, as is done in Canada. Source-based taxes also give rise to NFBs, and these can be eliminated by fully equalizing per capita differences in source-based state tax revenues, as in the full migration case. State public goods and services may not accrue equally to all residents: education serves school-age children, social services applies to the needy, health care applies to the ill, and so on. In general, different states will have different needs for public services based on their demographic make-ups. Equalization systems can readily take account of differences in need across states similar to the way in which revenue differences are dealt with, as is done in Australia and South Africa. The costs of provision of public services will also differ across states because of differences in population density, the urban–rural mix, climate, and so on. This is conceptually more difficult to deal with since it will generally not be optimal to provide the same level of public services when costs of provision differ.6 The method used is to base equalization on the standard pattern of services that states provide to residents in different geographic circumstances, and compensate states according to the share of their populations that reside in high-versus low-cost regions.

While equalization based on compensating states for differences in the NFBs their residents receive from state fiscal programs might be rationalized based on horizontal equity considerations, there are some overriding conceptual issues involved. The first is the standing of horizontal equity as a national policy objective, that is, the extent to which social welfare is a national as opposed to a state-by-state objective. This obviously involves a value judgment that ideally reflects a national consensus. In some nations, equal treatment of equals is a matter of social citizenship. It may be enshrined in the constitution, as in Canada, Germany, and South Africa, or it may simply be a matter of societal consensus. The Commission on Scottish Devolution and the Independent Commission on Funding and Finance for Wales in the UK took it for granted that the financial arrangements for devolution should respect the principle of comparable access to public services in all regions, a principle that is meant to guide fiscal transfers from the UK Parliament to devolved governments. The extent of social consensus for equal access to public services can be strained in countries where there are large inequalities among states or differences in language, culture, or religious affiliation (Belgium, Canada, and Spain). Despite this, horizontal equalization is a feature of most federations, the USA being a notable exception (except within states), and arguments against revenue decentralization often include the adverse consequences for fiscal equity.

A second conceptual issue concerns incentive effects. Simply equalizing actual NFBs would have strong disincentive effects, as states would lose little by reducing their revenue intake anticipating being compensated through equalization transfers. To avoid this, equalization systems are typically designed to minimize the ability of states to influence their own transfers, such as by basing transfers on representative fiscal systems that reflect average state policies. On the revenue side, equalization entitlements are calculated by applying average state tax rates to each state’s tax base, or to a commonly defined representative state tax base. As long as states have relatively limited influence over their tax bases, incentive problems are minimized. Similarly, on the expenditure side one calculates the per capita costs of providing standard public services. As long as state tax structures and public services do not vary much, applying these approaches is feasible.7

6 Albouy (2009) argues that wage differences may reflect differences in the value of local amenities. If that is the case, equalization based on state revenues will over-   
7 See, for example, Broadway (2004) and Broadway and Shah (2007). There have been many country-specific studies of equalization, including Financial and Fiscal Commission (2000) in South Africa; Expert Panel on Equalization and Territorial Formul
When states can influence the size of their tax bases, subtler incentive effects arise. Bucovetsky and Smart (2006) emphasize that equalization causes states to underestimate their marginal cost of public funds. When state tax rates are increased, the resulting fall in the tax base will be compensated by the equalization system. Thus, states will have an incentive to over-expand, though there is little evidence that such effects are empirically important. In some circumstances, states may have more direct effects on their tax bases, as when they have access to natural resource revenues within their borders. They can influence the rate at which natural resources are exploited by controlling licenses for exploration and extraction.

A third conceptual issue brings us back to the Tiebout model with its emphasis on different tax–expenditure mixes across states. Although states provide comparable sorts of public services and have access to similar types of taxes, they do not adopt identical fiscal structures, and would be unlikely to do so even if equalization enabled them. Given the complexity of political decision-making, it would be highly unlikely that two states did choose the same policies unless they were consciously imitating one another. That being the case, achieving full horizontal equity in a federation is not feasible. Moreover, it is not desirable since it would undo the independent choices made by state governments, and violate one of the purposes of federalism, which is to allow states the discretion to make their own decisions on matters affecting their residents. This does not negate the need for equalization, but it calls for a compromise between the objective of equalization to foster the equal treatment of equals, and the purpose of federalism. The compromise typically made is to take as the objective of equalization that of equalizing the potential for states to provide comparable levels of public services at comparable rates of tax, but to allow states the discretion to exercise that potential as they see fit (subject to some caveats concerning the existence of other national objectives). The implementation of this compromise will be ambiguous, but that is the nature of federalism.

There are two potential caveats to the above analysis, which relies on the absence of mobility to generate unequal utilities across states. Trade in goods and services along with capital mobility will tend to equalize wage rates according to the factor-price equalization theory of international trade. Although the conditions for factor-price equalization may not strictly apply in practice because of costs of transport and differences in technology across states, presumably there is still a significant tendency for wage convergence. Despite that, horizontal equity arguments for equalization still apply as long as labor is immobile. Different states will still have different skill distributions, so differences in the ability to raise revenues using residence-based taxes still apply. They may also have differences in the ability to raise source-based revenues if they have different endowments of natural resources. Thus, while wage equalization eliminates differences in utility arising from private incomes, it does not eliminate NFBS from public goods and services.

Second, labor immobility might be restricted to certain types of workers. Baicker et al. (2010) document that the young are much more mobile than the old. To the extent that state governments are far-sighted enough to offer policies based on the lifetime utilities of their residents, the earlier analysis with mobile labor would apply. State government fiscal policies would maximize the expected lifetime utility of the young subject to a migration equilibrium constraint requiring equal lifetime utilities across states. Hoges and Luttmer (2010) do find evidence for the US that new residents of a state can expect to receive a package of lifetime social insurance that has a positive present value net benefit. However, extending the mobile-labor model of federalism to a lifetime context requires assuming that state governments are able to commit to future tax–expenditure policies decades in advance. Failing that, the consequences of viewing mobility as a very long-run decision can be quite stark, as we next consider.

3.1.2. Migration as a long-run decision

Migration may occur, but may be a longer-run decision than government fiscal decisions. In these circumstances, it might be reasonable to think of households choosing their state of residence before policies are chosen. Then, the Tiebout model is turned on its head: instead of household migration decisions responding to state fiscal choices, state fiscal choices respond to migration outcomes. If migration decisions are based solely on economic opportunities, the analysis can proceed as if households were immobile as in the previous section. However, if households give weight to state fiscal policies and anticipate them in making their migration choices, outcomes in the federation can be viewed as the subgame perfect equilibrium of a two-stage process. If we adopt standard multi-stage game-theoretic equilibrium concepts, it is as if the government cannot commit ex ante to policies before households migrate. Reversing the timing of decisions in this way changes the results from earlier mobility models drastically and can lead to significantly adverse outcomes.

To see the consequences of migration being a long-run decision in its starkest form, consider the framework in Mitsui and Sato (2001). Ex ante identical households move first and can choose costlessly but irreversibly their state of residence. Governments move next, with the federal government moving before the states. (Later we consider some important consequences of the states choosing policies before the federal government.) Each state has a strictly concave production function in labor as earlier. The states choose the level of state public goods to be financed from local rents, a head tax and an equalization transfer (positive or negative) they receive from the federal government. Taking their populations as given, they satisfy the Samuelson condition. The federal government, also taking state populations as given, chooses equalization transfers that are purely redistributive. For simplicity, there are no national public goods, though that would make no difference to the results. The households choose their state of residence anticipating subsequent government policies. They have no individual effect on those policies.

Consider the federal government’s choice of transfers. Anticipating state behavior, the federal government foresees the effect its equalization transfers will have on per capita utility in each state, where the latter may be denoted \( V_i(L_i, S_i) \) for state \( i = 1, \ldots, h \). It chooses transfers to maximize a social welfare function \( W(V_1, \ldots, V_h, V^0) \), which exhibits finite and non-negative aversion to inequality. Given the allocation of population \( L_1, \ldots, L_h \), optimal equalization transfers will result in utilities that are increasing in population. For example, in the utilitarian case, marginal utilities of private consumption will be equalized across states. Given that more populous states will have higher levels of the state public good by the Samuelson condition, those in more populous states will be better off. This will generally be the case for a government with non-negative aversion to inequality, unless the government adopts a maxi-min social welfare function and equalizes utilities everywhere (so removes any benefit from ex ante migration).

Given that utilities will be higher in more populous states, the only stable equilibrium will be where households all migrate to the same state, which is generally a non-optimal outcome. In effect, equalization is a welfare-reducing policy. The equilibrium outcome exaggerates the benefits of agglomeration, and equalization’s supposed benefits are negated.

3.2. Expenditure assignment and decentralization

In the Tiebout–Musgrave–Oates tradition, expenditure assignment was based on the principle that state governments should be responsible for state public goods, and revenue assignment was based on the benefit principle. This was in keeping with the idea that redistribution was a federal responsibility, and that state
governments could best provide the mix of state public goods that suit the preferences of their residents.

When we observe the reality of state fiscal structures — and local ones in unitary nations as well — these ideals are far from observed. While state governments do provide state public goods, by far their most important programs in most federations consist of quasi-private goods, social insurance and targeted transfers, including education, care for the elderly and children, health care, welfare and social services, and sometimes unemployment insurance. These programs are largely redistributive in nature (though to some extent over each person’s life-cycle as shown in Hoynes and Luttmer, 2010). While some state revenues, like property taxes and user fees, are benefit-related, others are income- or consumption-related and have redistributive consequences. Moreover, systematic differences in preferences for state fiscal programs seem not to be their characterizing feature: different states provide comparable mixes of the main public services.

The current fiscal federalism literature focuses on a different set of arguments for decentralizing fiscal responsibilities to state governments. Some of them are as follows.

3.2.1. Information about needs for public services

As in Oates (1972), local knowledge still plays an important role, but a more general one. Where public services are targeted to particular groups who need them, state and local policy-makers are better able to identify those needs and design state programs accordingly. For example, the location of schools and hospitals, the mix of services provided by them, and the choice of hiring priorities require local knowledge. The targeting of local needs makes public service provision inherently complex and must be set against scale economies from more central provision. Almost all federations resolve this trade-off by assigning delivery responsibilities to the state level. A more difficult trade-off involves setting the efficiency of decentralized provision against the fact that many state-provided services have important equity consequences, including distributive effects, social insurance and equality of opportunity. This suggests that the federal government, acting on behalf of the nation, has an interest in program design. We return to that below.

3.2.2. Agency problems

Related to the above, the delivery of public services and targeted transfers to citizen–clients faces classical agency problems. Some of these involve hidden information, such as ascertaining the true costs of building and operating local schools, hospitals and welfare delivery agencies (Broadway et al., 1999; Lockwood, 1999). Others involve hidden action by local managers and social workers responsible for delivering targeted public services. The presumption is that agency problems can be alleviated by decentralization, which reduces the layers of bureaucracy. On the other hand, decentralization itself may raise agency problems between the federal and state governments. This may arise if the federal government is implementing interstate redistribution under asymmetric information about state tax bases, although such agency problems can be mitigated by appropriate interstate transfers (Bordignon et al., 2001).

3.2.3. Innovation

A further benefit of decentralizing the provision of public services is that it allows for experimentation and innovation, so-called ‘laboratory federalism’ (Oates, 1999). Assuming that state governments are motivated by providing public services in the most cost-effective way, the fact that several states are simultaneously pursuing cost-reducing innovations increases the chance of good innovations occurring. Innovative methods of delivering public services can then be imitated by other states, also as a way of reducing costs. On the other hand, as Strumpf (2002) emphasizes, state innovative effort might be sub-optimal since states ignore the expected benefit to neighboring states.

This problem of cost-effective service delivery is particularly important in the public sector given its labor-intensity and the fact that productivity growth tends to be less than in the private sector, as Baumol (1967) noted. Innovation in the rest of the economy increases the cost of labor and therefore increases the relative cost of public services. This motivates responsible governments to seek ways of improving productivity.

3.2.4. Accountability

It is often argued that decentralization enhances accountability, the loose argument being that the closer they are to the citizens, the more responsive will public service providers be to citizens’ interests. One can identify at least three classes of reasons why this may be the case. The first is that if public services are decentralized, citizen–voters can more closely identify the decision-makers responsible for services they receive, and can better associate the taxes they pay with the services they receive. This enables them to exercise voice in ensuring that problems with service delivery can be brought to the attention of decision-makers and rectified. Since higher-level governments are responsible for providing services to a broader population, it is more difficult to know who to hold responsible for public services supplied locally, especially where discretion is involved in tailoring public services to local needs. Put differently, decision-makers in a more centralized system may be responsible for more public services that affect many states. In contrast, under decentralized provision, decision-makers are responsible for more specialized public services delivered to one state, which should improve accountability (Persson and Tabellini, 2002). There is some evidence that decentralization makes local service provision more responsive to citizens’ needs. For example, Fuguet (2004) argues that decentralization in Bolivia improved the targeting of human capital investment and social services to the neediest localities.

A second and related argument is that public services delivered closer to the citizen–clients allow more participation by the latter in design and delivery. The World Bank (2003) argued that both client choice and participation in service delivery to the poor enable the poor to monitor and discipline service-providers. Citizen participation can take a variety of forms, such as serving on local advisory or governing bodies and taking a financial stake through user fees. Opportunities for participation are greater the more decentralized is service delivery. One study that showed how accountability can be enhanced by citizen participation was by Schaltegger and Torgler (2007). They found that Swiss cantons in which voters participate directly in the political process through initiatives and public referenda have lower levels of indebtedness.

The third argument is that decentralization creates the opportunity for comparing public service provision in one state with that in others. As mentioned above, innovations in public service delivery should be facilitated by decentralization and these can be imitated by other states. As well, citizens can use observations from neighboring states as a yardstick for learning information about costs of provision of public services. Yardstick competition can discipline state politicians to prevent excessive rent-taking or lax effort. Besley and Case (1995) provide evidence that state politicians’ policy choices,
particularly with respect to tax rates, are responsive to those in neighboring states, and that voters penalize politicians who deviate from policies of neighboring states. A related argument for decentralization is presented in Seabright (1996) who argues that decentralization may increase accountability if the level of welfare resulting from government policies, although observable by electors, is not verifiable. By giving the power to determine the reelection of governments to state constituents, decentralization has the potential to increase government accountability.

Yardstick competition is related to fiscal competition in its effect, but its motivation differs. As discussed above, fiscal competition relies on mobility of tax bases, which can induce states to compete tax rates down and provides some discipline to state governments. An exception is commodity tax-setting under cross-border shopping. States who sell to cross-border shoppers have an incentive to raise taxes since that exports the costs to non-residents (Mintz and Tulkens, 1986; Kanbur and Keen, 1993; Lockwood, 2001). Yardstick competition does not rely on mobility. It relies simply on the discipline effect of information transmission.

3.2.5. Rent-seeking, corruption and growth

Decentralization can affect the extent of corruption or rent-seeking. There are factors working in opposing directions. On the one hand, decentralization reduces the size of rents both because rents are competed away to some extent and because rents are divided among states so there is less at stake for rent-seekers. On the other hand, corruption might be facilitated because interpersonal contacts are higher at the state level. Sato (2003) constructs a model in which rent-seeking is reduced by decentralization because rents are reduced and lobby groups are diminished in size. He argues that the beneficial effects of reduced rent-seeking resulting from decentralization offset at least some of the costs of tax competition. Bordignon et al. (2008) argue that the welfare-reducing impact of lobbying will be mitigated under decentralization when the lobby groups of different regions have aligned interests. Lobbying will reduce the distortion that arises because regional governments fail to take into account the positive spillovers to other regions. In contrast, when regional lobbies have conflicting interests, centralization reduces the welfare effect of lobbying.

Empirical studies support the possibility of decentralization reducing rent-seeking or corruption. Fisman and Gatti (2002a), using data for US states for 1976–87, estimate that larger federal transfers to a state increase the rate of conviction for abuse of public office. This suggests that more reliance on federal transfers rather than own-source revenues induces corruption. The same authors study the relationship between fiscal decentralization and corruption using international cross-section data (Fisman and Gatti, 2002b). They show that fiscal decentralization of government expenditures significantly reduces corruption, measured using the corruption index of the International Country Risk Guide. Fan et al. (2009) use firm-level survey data on bribery experience to study the relation between decentralization and corruption. Their results confirm that decentralization of revenue-raising reduces corruption. However, complexity of government, measured as more tiers of government or more local public employees, increases it. Thus, decentralization alone does not fully explain corruption.

Decentralization might also contribute to economic growth if infrastructure might be provided more efficiently by state-level governments and fiscal competition might constrain taxes on firms. As well, lower capital income taxes might stimulate saving, which will increase growth in endogenous growth models (Hatfield, 2009). On the other hand, Köthenbürger and Lockwood (2010) argue that this effect will be mitigated if mobile capital is subject to productivity shocks. These will lead to portfolio diversification which weakens tax competition, and may even cause capital tax rates to be higher when capital is mobile. If this effect is sufficiently important, tax rates may be higher, and growth lower, under decentralization.

The empirical evidence is mixed. Some authors find a positive relation between growth and fiscal decentralization measured as the share of sub-national revenues or expenditures (Akai and Sakata, 2002 for a cross section of US states). Thiessen (2003) finds positive effects for low rates of decentralization, but negative effects for higher ones. However, when Thornton (2007) measures decentralization by the share of national revenues that states actually have discretion over (as opposed to, say, simply sharing revenues with the federal government), no significant relationship is found.

3.3. Tax assignment and federal-state transfers

Much is at stake in the assignment of revenue-raising responsibilities. More decentralized revenue-raising can affect the efficiency of markets in the federation, through the potential for dis harmonization of the tax system and beggar-thy-neighbor tax policies. Equity is affected if states choose different degrees of progressivity in their fiscal systems from one another and from the federal government. Revenue decentralization also affects the need for federal-state transfers to make up deficiencies in the ability of states to finance their expenditure programs and possibly to address horizontal imbalances in tax bases across states.

In a Tiebout-like world, these issues do not arise. Revenue decentralization is driven by the principle of benefit taxation, and ideally states would be expected to stand on their own fiscal feet. However, in actual federations, the issue of revenue decentralization is a challenging one, as the following discussion illustrates.

3.3.1. Tax assignment versus revenue decentralization

There are two levels on which to discuss state taxation responsibilities. One is the constitutional issue of which tax types states ought to be able to use. The other is how much responsibility states should have for raising the revenue to finance their own expenditures as opposed to relying on federal transfers.

Both issues are informed by the fact that in typical federations, aggregate state expenditures are of the same order of magnitude as federal expenditures, especially goods and services expenditures. Moreover, the kinds of public services provided by the states include some that have redistributive consequences, so benefit taxation is not a feasible option. This implies that if states are to be responsible for a significant proportion of own-revenue financing, they need access to at least one broad tax base, like income, sales or payrolls, which is likely co-occupied by the federal government. On economic grounds, there is relatively little to choose from among these three bases. All are different forms of residence-based taxes. On efficiency grounds, the main concern has to do with implications of state taxation for the efficiency of cross-border transactions. Income taxes can in principle lead to issues with respect to the mobility of capital and entrepreneurs across state borders, while sales taxes can lead to cross-border shopping. Payroll taxes may affect the choice of state of residence, especially where that can differ from state of employment. However, given the differentials in state tax rates that typically apply, these effects are likely to be limited.

More important are equity and administrative considerations. In the case of the income tax, if tax structures are chosen independently, states are likely to choose different bases as well as different rate structures from each other as well as from the federal government. This may be viewed as compromising national redistributive objectives to the extent that equity is viewed as being defined nationally. As well, compliance and collection costs increase if different tax systems are used at the state and federal levels.
Sales taxation poses special problems in a federation. There are solid arguments for adopting a value-added tax (VAT) as the sales tax of choice. A VAT has two main advantages over a single-stage sales tax (Crawford et al., 2008). First, because of the crediting mechanism, taxes on intermediate inputs are eliminated and production efficiency is achieved (at least for registered traders). Second, a VAT treats domestically produced products on a par with foreign goods since all taxes can be purged from exports, while imports are fully taxed. However, the multi-stage feature of a VAT makes it difficult to decentralize to states in the absence of border controls. Input tax crediting and taxing cross-border purchases are difficult to monitor and administer, especially where different state tax rates apply and state VATs co-exist with a federal one. There are mechanisms that can in principle resolve these problems, but they have yet to be tested in federations or economic unions (Bird and Gendron, 1998; Varsano, 1999; Keen and Smith, 2000). One is the deferred-payment method where cross-border transactions between firms are zero-rated in the state of origin and exempted in the destination state. The tax is paid at the next stage of production (or by the consumer in the case of final consumption goods) in the destination state. Another option is the VIVAT system of Keen and Smith (2000) where all states impose the same tax rate on interfirm transactions, whether it takes place within or across states, but sales to consumers are taxed at different rates across states.

Some of these problems can be addressed by agreements between the federal government and the states. Revenue-sharing mechanisms enable states to obtain a share of the revenues from a given tax-type while retaining full uniformity of the base and rate structure. However, revenue-sharing leaves states with virtually no control over the revenues accruing to them. An alternative, which applies more to income and payroll taxation, is a formal tax harmonization arrangement whereby the states piggy-back onto the federal tax system. States may impose a surtax on federal tax liabilities or the federal tax base, or they may impose their own rate structures on the federal base (as in Canada and some US states). A significant advantage of harmonized arrangements is that they permit a single tax-collecting authority, which economizes on collection and compliance costs, albeit at expense of some state autonomy.

Different federations have different constitutional assignments of tax sources. Some, like Canada and the USA, allow state-level governments access to virtually any broad-based tax, as well as to narrower taxes like excises and corporate taxes. Others assign taxes in a more proscribed way. Australian states are allowed to use only relatively narrow tax bases. All income taxes and VAT are collected by the Commonwealth government, and states rely relatively heavily on transfers to finance their expenditure programs. In Germany, most taxes are assigned centrally, and there is a formal revenue-sharing arrangement by which the Länder obtain most of their revenues. The diversity of revenue arrangements is much more pronounced than for expenditures. Differences in fiscal decentralization arise mainly on the revenue side.

The fact that in many federations, both the federal and state levels of government have access to the same broad tax bases means that the revenue assignment issue is less a matter of constitutional flat than of how the revenues from each tax base are shared between levels of government. This is an endogenous process that depends jointly on the tax rates that both levels choose to apply to the same base, as well as the level of federal–state transfers that closes the endogenous fiscal gap.

### 3.3.2. Federal–state transfers

Regardless of the extent to which state governments have access to broad-based revenue sources, a common feature of federations is a vertical fiscal gap: the federal government raises more revenues than it needs for its own program spending and transfers the excess to the states. In principle, it is possible to decentralize enough revenue-raising responsibility to the states to make them self-sufficient and to eliminate the need for federal transfers, at least in federations where states have the constitutional ability to use broad-based taxes. Such an outcome could be achieved at federal initiative by a unilateral reduction in federal transfers and a reduction in federal tax rates on co-occupied or other tax bases. In practice, federations are continually adjusting the level of transfers and the division of tax room between the federal and state governments. In some federations (e.g., Belgium, Canada, and Spain), there has been a gradual evolution toward greater state self-sufficiency, coincident with the higher rate of growth of state expenditures in areas like health care and education. However, there remains a sizeable fiscal gap in virtually all federations.

There are a number of reasons why vertical fiscal gaps are maintained. One is that states have different fiscal capacities (i.e., tax bases per capita), and the decentralization of revenue-raising exacerbates those differences. To the extent that the federal government assumes responsibility for equalizing state fiscal capacities, decentralization compromises its ability. Unless the equalization system is purely redistributive among states (as it was in Germany before unification and is in Sweden among local governments), there is a minimum fiscal gap that is compatible with achieving a given degree of equalization. Moreover, the more decentralization there is, the less national consensus there will be for achieving equalization.

A second reason is that revenue decentralization reduces the extent of built-in stabilization against regional economic shocks (Von Hagen, 2007). The equalization system is one of the main mechanisms for insuring against such shocks, along with labor mobility and the federal income tax system. Unless the equalization system compensates for revenue decentralization, interregional stabilization will suffer.

Third, there are structural reasons for the federal government to occupy some minimum share of the tax room. A harmonized tax system is facilitated by the federal government having enough dominance in a given tax-type such that a uniform tax base and single tax collecting authority can be maintained. In the case of the VAT, decentralization of discretionary revenue-raising to the states, while possible, is administratively very complex. Few federations attempt to decentralize VAT to the states, Brazil, Canada and India being exceptions, and in the Canadian case decentralization is only partial as the provinces have minimal discretion in setting tax rates. In the case of the income tax, federal dominance also makes harmonization more likely, and allows the federal government to use the rate structure to achieve redistributive objectives.

Finally, in most federations, the transfer system contains some degree of conditionality. The traditional argument for matching conditional grants as Pigouvian-type devices for internalizing interstate spillovers has been superseded by a much more general view of the grant system as a device for federal influence over state programs. Recall that important components of state expenditure responsibilities are major public services like education, health and social insurance programs. Given the importance of these programs for equity and equality of opportunity, the federal government has an interest in how they are designed and delivered, and in some federations shares the constitutional obligation for providing such services. The federal government typically exercises its influence by imposing conditions on its transfers, though they can be relatively broad and non-intrusive, such as requiring that state programs achieve some minimal national standards (Australia, Canada). In other cases, the federal government might actually legislate program requirements and rely on the states to implement them (Germany). Bloc conditional grants may also effectively enforce minimum spending levels on particular state programs (USA). A tension always exists between the efficiency benefits of state discretion and the desire of the federal government to influence...
the design of state programs. The key is to make transfer conditions as non-intrusive as possible consistent with national objectives being achieved. Some dispute settlement mechanism must exist for interpreting whether states have in fact abided by the required conditions, and if not, how they will be sanctioned. In the end, the setting of conditions on federal grants and their enforcement takes on a largely political dimension, and can be a source of tension.

The political nature of grants has been emphasized in empirical work. Johansson (2003) estimates the determinants of grants to municipalities in Sweden, and finds, following the predictions of Downsian electoral competition models, that grants are allocated disproportionately to swing districts in an effort to improve the chances of electoral success. Milligan and Smart (2005) find only limited support for the swing-district hypothesis. Instead, grants go disproportionately to districts of members of the governing party, suggesting a bargaining explanation for parties rewarding their core supporters. Knight (2005) also finds support for a legislative-bargaining explanation for grants. Federal transportation grants in the USA favor the districts of congressional representatives who sit on the transportation committee, so have bargaining or proposal power. More recently, Solé-Ollé and Sorribas-Navarro (2008) find that municipalities in Spain receive more grants if they are politically aligned with upper-level granting governments, which might also be taken as support for the bargaining approach to grants.

3.3.3. Vertical interaction

The essence of a federal system is that the two levels of government have legislative independence. But, the fiscal decisions of individual governments have spillover effects on others. While the traditional focus in the spirit of Tiebout has been on fiscal spillovers across states – horizontal fiscal externalities – recent emphasis has been put on interdependencies between federal and state fiscal decisions. Given the bilateral nature of federal–state interaction, these interdependencies can give rise to strategic behavior. Two main types of federal–state interaction have been studied, one involving the interdependence of tax and expenditure decisions of the two levels of government — vertical fiscal externalities — and the other involving more direct interaction through federal–state transfers. Consider these in turn.

Vertical fiscal externalities arise when the choices of one level of government affect the fiscal options of the other (Johnson, 1988). Much of the emphasis has been on vertical tax externalities that arise when the two levels of government share similar tax bases (Boadway and Keen, 1996; Dahlby, 1996; Keen, 1998). Suppose the federal government applies a tax on income. A state government when deciding on its own tax rate will recognize that an increase in the rate will reduce its base and limit the additional revenues it raises. It will not take account of how federal revenues will be affected by the same reduction in base, so will have an incentive to over-expand relative to the social optimum. The size of this externality will be higher the higher is the federal tax rate.12 Effectively, federal and state governments over-exploit the common tax base, analogous to the tragedy of the commons.

The federal government can mitigate this externality, especially if it is the first-mover. It can reduce the size of the externality by reducing transfers to the states and forcing them to become more self-sufficient. It can also reduce its own tax rate by containing its own expenditures below the optimal value. The consequence of the vertical fiscal externality can also be mitigated by countervailing horizontal tax competition effects, which tend to cause states to under-spend (Keen and Kotsogiannis, 2002). On the other hand, fiscal equalization systems that are based on the size of state tax bases will reinforce vertical tax externalities by encouraging states to raise tax rates without facing any revenue consequences (Bucovetsky and Smart, 2006).

If there are both vertical and horizontal fiscal externalities, Boadway et al. (1998) show that the social optimum may be achieved by decentralizing redistributive policies to the states, with federal taxes and transfers set to offset the fiscal externalities that the states are facing. Gordon and Cullen (2010) characterize the equilibrium allocation of redistributive policies across levels of governments from a positive perspective. Federal redistribution is set such that horizontal and vertical externalities exactly offset each other, leading to an overall level of redistribution (federal and state combined) that is optimal.

The empirical literature tends to support the existence of vertical fiscal externalities. Besley and Rosen (1998) study cigarettes and alcohol excise taxes in the USA, and find that state government tax rates are increasing in the federal tax rate. Devereux et al. (2007b) extend the Besley–Rosen analysis to allow for horizontal tax externalities as well, reflecting cross-border shopping. In the case of cigarettes, states respond negatively to neighboring state tax rates, but not to the federal tax rate, which is consistent with cigarette demand being inelastic. State gasoline taxation responds to federal tax rates but not to those in neighboring states. Esteller-Moré and Solé-Ollé (2001) estimate vertical tax externalities in US income taxation. They find that states increase their rates of personal income and general sales taxes in response to increases in federal tax rates. Similarly, Hayashi and Boadway (2001) find evidence for both vertical and horizontal externalities in the case of business income taxation in Canada. They also look for evidence that the federal government behaves as a Stackelberg leader, and find only weak empirical support. Finally, a particularly interesting study from the point of view of assessing the continuing importance of the Tiebout approach is that of Brülhart and Jametti (2006) for the case of local income taxes by Swiss municipalities. By taking advantage of the hierarchy of governments in the Swiss federation – federal, cantonal, and municipal – they are able to develop a method for differentiating empirically between vertical and horizontal fiscal externalities in local tax-setting. They find that vertical externalities significantly dominate horizontal ones, lending some support to the view that the horizontal competitive effects that Tiebout emphasized were not the most important form of intergovernmental strategic interaction.

The second form of interdependency between federal and state governments concerns whether the federal government chooses transfers in anticipation of how state policies will respond or in response to state policies. In game-theoretic terms, this is equivalent to the question of who is the first-mover, the federal or the state level of government, or neither.13 The normative approach to fiscal federalism, going back to Musgrave (1959) and Oates (1972) typically assumes, if only implicitly, that the federal government is the first-mover. However, much emphasis has been put recently on the consequences of alternative orders of decision-making (Goodspeed, 2002; Rodden et al., 2002; Vigneault, 2007).

If the federal government cannot commit to taxes and transfers before the states set their tax and expenditure policies, state governments have incentives to choose their policies strategically to attract larger federal transfers. State governments could do so by over-spending and running high budget deficits with the expectation that the federal government will bail them out: the soft-budget

12 Dahlby and Wilson (2003) show that the externality may go in the other direction when the tax base is before-tax labor income. An increase in the tax rate will cause labor supply to fall, but could cause tax-inclusive labor income to rise. 13 The presumption in the literature is that federal and state governments act non-cooperatively since each relies on independent legislatures to make fiscal decisions. However, it is clear that elements of cooperative decision-making occur, such as when intergovernmental agreements are made. As well, there is ongoing communication between representatives of all governments.
constraint problem (Kornai et al., 2003; Vigneault, 2007). Although the federal government may announce that it will not provide bailouts in the future, it may be unable to credibly commit not to do so once state governments face serious fiscal problems. State governments are then able to transfer part of the cost of their own programs to the residents of other states. The federal government may improve its commitment ability over time and induce some fiscal discipline by establishing a reputation of not providing bailouts (Vigneault, 2010), but doing so may be difficult when states face exogenous shocks to their tax bases. Restricting federal-state transfers to be formula-based rather than discretionary will reduce the temptation of the federal government to bail out states. State discipline might be encouraged by making them more reliant on own revenues and perhaps also implementing balanced-budget rules.

At the other extreme, in highly decentralized federations with a high degree of state fiscal autonomy, the federal government may respond to its own fiscal problems by reducing transfers to state governments. Federal budget deficits are then effectively shifted to state governments, leading to excessively hard state budget constraints (Roadway and Tremblay, 2006). An extreme case of this might be the tendency for federal governments to impose unfunded mandates on the states, a practice that mitigates soft budgets.

### 3.4. Efficiency in the internal economic union

The Tiebout model emphasized the benefits of fiscal competition and decentralized decision-making for the efficient functioning of the federation. Recently, emphasis has been put on some of the adverse effects of uncoordinated fiscal choices by state-level governments. As discussed earlier, fiscal competition might lead to inefficient state policy choices because of fiscal externalities, or inequitable ones from a race-to-the-bottom in state redistribution programs. There is also the potential for decentralized decision-making to distort cross-border flows of products and factors of production. This can occur as an incidental consequence of states choosing different fiscal systems, so that cross-border transactions are either distorted or are cumbersome because of the need to comply with more than one state’s tax-transfer systems, regulations, investment rules and procurement policies. It can also occur because states consciously adopt beggar-thy-neighbor policies to attract factors of production and businesses. The result is inefficiency in the internal economic union.

Different federations address inefficiency in their internal economic unions in different ways. A useful distinction may be made between negative and positive integration measures. Negative integration measures are intended to preclude state governments from undertaking policies that interfere with the efficient functioning of the economic union. Positive integration measures are those that encourage state governments to coordinate policies to facilitate unfettered cross-border transactions. Measures that pursue negative and positive integration can differ. What follows is a hierarchy of approaches found in various federations.

#### 3.4.1. Constitutional provisions

Federal constitutions might include statements ruling out state policies that interfere with interstate transactions. The Commerce Clause in the US Constitution is an example of this. A negative integration measure. If it were difficult for constitutions to require positive integration measures, then different federations enforce prohibitions against state legislation that interferes with interstate transactions. The courts may be responsible for ruling state laws unconstitutional for such violations. The federal government itself may be able to strike down state laws that are deemed to be in violation.

Imposing such restrictions on state policies is controversial, especially since in many cases, state laws that seemingly restrict interstate transactions may have other beneficial features. For example, state laws intended to protect the environment, the safety of workers, or the language and customs of state residents may be viewed as legitimate measures even if they cause a restraint of trade. Some of these issues may be avoided by assigning functions prone to be distortionary to the federal government, such as the regulation of labor markets and professions, or the regulation of competition.

#### 3.4.2. Cooperative agreements

Measures of positive integration are typically negotiated among the federal and state governments. Tax harmonization agreements are an example of this, but others might include environmental agreements, harmonization of professional standards and of state pensions and health insurance systems to ensure that mobility is not impeded. The difficulty is that agreements must be voluntarily agreed to by all participants. In practice, this can be circumvented by limited agreements between the federal government and a subset of states, so-called asymmetric federalism arrangements common in Canada, Malaysia and Spain. Enhanced cooperation agreements in the European Union exemplify this approach (Bordignon and Brusco, 2006).

In some cases, broad agreements have been negotiated by the federal government and the states. The Agreement on Internal Trade in Canada is an example of this. It is an agreement between the federal government and all provinces that includes both negative and positive integration measures, and that encompasses a broad spectrum of transactions including trade, investment, public procurement and labor mobility. It is analogous to international free trade agreements in spirit, though it has been ineffective because of the absence of a binding dispute settlement mechanism.

#### 3.4.3. Conditional grants

Conditional grants can also be used to encourage states to refrain from interfering with interstate transactions. Bloc conditional grants with general conditions can be used for this purpose (as in Australia and Canada). Conditions might include portability of benefits of state programs and other measures to ensure labor mobility and no-discrimination clauses affecting state procurement, regulation and tax policies.

As with the use of conditional grants to induce national standards in state social programs, conditions imposed for achieving efficiency in the internal economic union are controversial. There is bound to be some judgment in interpreting the conditions, and some discretion in penalizing states for non-compliance. There is also the danger of the federal government imposing conditions that are too intrusive and interfere with state legislative responsibility in their areas of responsibility. At the same time, the threat of punishment might be sufficient to allow the federal government to use moral suasion to induce states to behave cooperatively.

### 4. Some challenges for future research

There are many unresolved issues and new policy challenges in fiscal federalism, some related to elements of the Tiebout model. The combination of international competitiveness and fiscal tightness will put pressure on the manner in which states deliver public services. Advances in our understanding of political economy will no doubt contribute in unforeseen ways to the way in which fiscal decisions are divided between levels of government and coordinated. What follows is a brief review of some selected challenging issues.
4.1. Environmental federalism

Environmental policy has various federalism dimensions. Some environmental issues are regional in nature, but with cross-border spillover effects (air quality and water). State regulatory policies with environmental objectives have the potential to conflict with efficiency in interstate trade. Environmental policies of any scope face informational and enforcement issues, leading to a case for state implementation. Even where environmental externalities are national or global in nature, policy initiatives may involve the states, either individually or collectively. This is particularly true where environmental policies can implicitly reallocate rents among states. Energy-consuming states have some incentive to tax energy use; automobile-importing states are more likely to regulate automobile emissions, and so on.

State environmental policies give rise to harmonization issues analogous to those of income or sales taxes. If pollution taxation is imposed on a destination basis, arrangements must be made to tax the energy component of imports across state borders and credit that of exports. Given the absence of border controls, this is administratively challenging. Basing taxes on production seemingly avoids that problem, but unless other states are also taxing emissions of their producers, the competitive position of state producers is adversely affected. Courchene and Allan (2008) have suggested designing carbon taxes on a value-added basis using a credit-invoice method, which would be complicated if such taxes were at the state level.

Environmental policy in a federal setting may also give rise to vertical interactions, as recently examined by Williams (2010). He characterizes environmental regulations set simultaneously by the federal and state governments, and finds that the incentives of states to set relatively tight regulations, as well as the welfare consequences of state policies, may depend on the type of federal regulatory policy that is in place.

4.2. Agglomeration

In the Tiebout tradition, the spatial allocation of resources reflects the trade-off between diminishing returns to labor and economies of scale in financing and consuming state public goods. The latter is a form of agglomeration economy, and not surprisingly, multiple equilibria and corner solutions are possible. As the economic geography literature suggests, there are other sources of agglomeration that are likely to be much more important than the joint consumption of public goods. These include infrastructure, which can generate wasteful competition in public spending (Bucovetsky, 2005), benefits from a large local labor market (Boadway et al., 2004), external economies of scale in production from interfirm trade, product differentiation and knowledge spillovers. Devereux et al. (2007a) give evidence that production agglomeration influences firm location decisions.

The existence of agglomeration economies calls into question the conventional rationale for equalization, which is based on marginal fiscal externalities or fiscal equity in the existing equilibrium. Even in the full mobility models of Section 3, the possibility of multiple equilibria, especially in under-populated federations, means that global considerations must be taken into account. Equalization may perpetuate globally inefficient equilibria by discouraging migration to high-income areas to take advantage of agglomeration economies. Other policies besides federal–state transfers become important for the strategic development of the federation, such as infrastructure investment in transportation and communications. As well, attention to the growth of cities becomes relevant.

4.3. Natural resources

Another driver of regional development in federations concerns natural resources. Non-renewable natural resource wealth can be a mixed blessing in any nation because of the effect it can have on non-resource sectors, which are often the most innovative ones, on quality of governance, on internal conflict and on macro-economic management, especially due to the volatile nature of such revenues (Gelb, 1988; Sachs and Warner, 1999). The problem can be especially difficult in resource-rich federations where the natural resources accrue disproportionately in a small number of states. In these cases, at least some of the natural resource revenues typically remain in the resource-rich states, either by constitutional assignment or because political pressures are irresistible.

The decentralization of natural resource revenues to state governments causes various problems. Horizontal imbalances in fiscal capacity encourage fiscally-induced migration that can be of significant size (Day and Winer, 2006). If migration is limited, fiscal inequity results. Equalization transfers can address this issue, but this can be both costly for the federal government — especially if it does not have access to these revenues — and politically difficult since the states regard the natural resources as part of their property rights. Decentralization of resource revenues can leave resource-producing states with a volatile source of revenue that cannot be set against other revenues as well as at the federal level. The state governments may also be less able or willing to establish a resource fund to save the revenues for the future, and that will exacerbate the resource curse. Resource-rich states also have a strong temptation to use the revenues for state-building purpose, by investing in infrastructure and diversification that diverts economic activity from other states. The result is an arbitrary development pattern in which industry grows in regions endowed with natural resources when other patterns might make more sense from an economic geography perspective.

4.4. Timing and commitment

As mentioned, the timing of decisions in a federation, or the ability of governments to commit to announced policies, can have adverse effects, especially if decision-makers can anticipate the inability to commit. The issue of commitment is relevant in many fiscal federalism contexts. It influences the form of federal grants, especially their size and the extent to which they are formula-based. It is important in influencing how federations respond to regional and aggregate shocks. To some extent, constitutional or legislative rules, such as balanced-budget requirements or borrowing limitations, can mitigate commitment problems, but like incomplete contracts, they cannot take all contingencies into account so may be too inflexible.

4.5. Federal–state institutions

In the end, federal policy outcomes are the result of political decision-making. While political economy has made some progress in understanding some basic influences on government decision-making, matters are complicated in federations by the existence of several independent and interdependent governments. Standard models of non-cooperative decision-making in federations do not capture the reality or complexity of actual federal processes. Institutions do exist for federal–state interaction. In most federations, there is continual discussion and negotiation by intergovernmental committees that influence outcomes. Federal influence on state decisions can occur by many means, from financial incentives to moral suasion to coordinating policies. In some federations, influential quasi-independent bodies exist for advising on federal–state fiscal arrangements. There are also instances of negotiated federal–state or state-state agreements to coordinate outcomes. These are a long way from the competitive community managers in Tiebout’s narrative, especially in federations where there are relatively few states. The political economy of constitution-making in federations is also in need of exploration.
In conclusion, the fiscal federalism literature, as distinct from the literature on local public goods, has moved beyond the Tiebout model. Some elements adopted from the Tiebout model have become dated, such as the ideal of benefit taxation at the state level and the characterization of expenditure assignment in terms of state public goods. In most federations, state government expenditure-tax systems are an important part of the redistributive and social insurance fabric of the public sector, and this has implications for federal-state fiscal arrangements. The mobility assumption of the Tiebout model plays a more limited role than in classical federalism models, although mobility of factors other than labor is important. The Tiebout insight about the potentially beneficial effects of interstate competition has had a more lasting legacy, although it is recognized that fiscal competition can have both positive and negative consequences. The way in which fiscal federalism has departed most from Tiebout is in the appreciation that fiscal decision-making in a federation is much more complicated than the community manager view. Government decision-making is inherently complex, involving political, historical and institutional factors. The way in which governments interact in a federation is more complex than simple Nash or sequential theories would suggest. This means that the field of fiscal federalism remains rich in research potential.

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