Tax financing and tax equalization: Incentives and distribution in the welfare state

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Draft for Copenhagen workshop 2013

Abstract

Local tax financing is of key importance for local democracy and incentives for business development and service provision. But because tax base variation leads to variation in service provision, tax equalization may be necessary to limit the adverse distributional effects. Tax financing and tax equalization are interrelated and should not be analyzed in isolation. The purpose of the paper is to discuss the challenges of combining substantial tax financing, incentives, and distribution.

Preliminary, date: August 27, 2013

Comments welcome, to be developed

1. Introduction

Local governments in the Nordic countries are responsible for comprehensive welfare service and are an integrated part of the national public sector. The design is very different from the textbook model of local public finance assuming local public goods, mobility and benefit taxation. The Nordics differ in all three characteristics. First, the local public sector is responsible for welfare services with strong redistributive characteristics, most of them can be called publicly provided private goods, and local public goods only take a small share of local spending. Second, mobility of the population is low and local jurisdictions are heterogeneous with respect to preferences for welfare services and local public goods. Third, financing is centralized and dominated by regulated income tax revenue sharing and central government grants. The local governments are formed by national governments to arrange an efficient division of labor within a large public sector.

Nordic economists have struggled to understand local governments under this design for decades. Lotz (1998) expresses the frustration among economists of the region that the guidelines from local public finance theory are of so limited relevance. Philip (1954) presented an early account of the challenges involved. When publicly provided private goods rather than local public goods are the main responsibility, we are in a much more open territory concerning principles for organization and financing. The international literature has acknowledged the lack of clear criteria for the handling of 'merit goods' (Musgrave, 1959) or 'redistributive services'. Since we cannot give solid economic arguments for government responsibility for publicly provided private goods in the first place, we also lack arguments for decentralization of such services. The design of the local public sectors ends up more as a question of administrative convenience than economic principle. The design is better described as delegation rather than decentralization, and can be called 'administrative federalism'.

The Nordic departure from the standard recipe for local government also has consequences for the central government level. The Nordics decentralize a large part of the distribution policy, but the decentralization of provision and production is associated with mandating and sophisticated control systems. The active local-central government interaction implies a challenge for central government control also, with a permanent and strong spending pressure against central government funds. Interestingly, the central government is vulnerable in this centralized environment. Decentralized governments can exploit the national political concern for the access to and quality of the welfare services they provide. Rattsø (2003) discusses the consequences of vertical fiscal imbalance. The Nordic countries have chosen different ways of handling this situation. Denmark and Sweden have sought to achieve more local responsibility by local tax discretion. In all countries mandating, and detailed service regulation combined with balanced budget requirement and loan controls impose fiscal discipline on the system.

In this article we will concentrate on the handling of tax financing and tax equalization in the Nordic system as understood based on local public finance theory. The tradeoff between local financing and accountability and equalization is the background problem dealt with. We draw on earlier work including Borge (2010, 2011), Rattsø (2005) and Borge and Rattsø (1998), but with a more narrow focus on tax financing here.

2. Tax financing

In an international context, the Nordic countries are characterized by the important role of the local income tax. Income taxes dominate as the main source of local tax revenue, varying from 85% of local taxes in Iceland to 100% in Sweden. The tax base for the local income tax is a broad measure of income including salaries, capital income and pensions, and all at an individual basis. The income tax is designed by the central government (definition of tax base, tax rules like deductions) and shared between local and central governments. The income tax is consequently a revenue-sharing arrangement. The local share is determined by a flat tax rate, but the revenue generated by this tax rate is affected by the central government design, like expenditure deductions. In practice the local income tax is progressive, the marginal tax is larger than the average tax for the tax payer. All local governments in all Nordic countries have some discretion in determining the tax rate for the local part of the income tax revenue.

The international literature on tax assignment, nicely summarized by Bird (1999) and McLure (2001), does not emphasize income tax financing. The starting point is typically the mobility of the tax base. Oates (1996) clarifies the conditions for efficiency-enhancing competition among jurisdictions, notably the use of benefit taxation. Redistributive taxes may influence the mobility of households and firms, and such tax competition may distort the tax decision. A mobile tax base may encourage tax competition and lead to low taxes and underprovision of local public services. The Brennan-Buchanan (1977) view is less pessimistic about tax competition. The argument is that tax competition may counterbalance political failures that lead to a large and inefficient public sector.

The most obvious argument for an even distribution of the tax base is equity since an uneven distribution of the tax base is a source of differences in service standards across local governments. The central government can compensate for differences by a tax equalization system, but an ambitious tax equalization program weakens the link between the local tax base and local government revenue. An even distribution of the tax base can also be defended on efficiency grounds, since it reduces the incentives for fiscally induced migration. One of the consequences of this argument is that local governments should avoid having highly progressive taxes. Associated with this, the tax design should avoid giving local governments instruments in a local distribution policy.

The local public sector is typically considered as destabilizing in a macroeconomic context. When local tax revenues are pro-cyclical, balanced-budget-rules imply that local public spending tends to increase in booms and fall in recessions. A tax base that is stable over the business cycle can serve as an automatic stabilizer.
The motivation of the Nordics to rely on the personal income tax is mainly the need to generate a significant amount of revenue, well beyond countries with fragmented local governments providing limited public goods. The income tax is based on the residence principle, but does not offer the strong linkage between local government performance and tax base as desired by theory. Compared to the conventional criteria the income tax is more mobile and more cyclical. The variation in income tax revenue over the business cycle follows from the procyclical character of labor and capital income. The mobility of the income tax base may induce tax competition as income taxation may give an incentive to attract high-income individuals. The challenges related to distribution and mobility of income taxation are addressed by tax equalization schemes.

The responsibility for welfare services and the associated distribution policy challenge motivates central government interventions and disturbs the local autonomy and accountability. The distribution problem fundamentally results from differences in the private income tax base across local governments. It is influenced both by the size structure of local governments and the geographic pattern of economic activity.

All countries deal with the tax base differences by extensive tax equalization schemes. Expenditure equalization arrangements add to the effect. Norway is a case in point. The private rich urban communities in the south end up with the lowest municipal revenue per capita, while the most prosperous municipalities are small rural communities, at the very top when they have waterfalls and/ or are located in the north. The tax equalization systems seriously affect the incentives of local taxation and obviously reduce the local autonomy of taxation.

3. Tax discretion and regulation

In a welfare state setting with strong goals of equalization, the allocation gain of decentralization is less clear cut. Local governments to a large extent operate as agents for the central government and must follow the national welfare policy guidelines,. The establishment of local accountability in this context is difficult. In the literature this is more closely related to the Brennan-Buchanan-approach. The role of tax discretion influences the relationship between local and central governments. Tax discretion can help local governments take full responsibility for the services they provide and reduce the spending pressure towards central government. Carlsen (1994, 1998) offers theoretical models to capture strategic interactions and arguments for regulations in this setting. The strategic interaction can be understood as a bailout problem, as analyzed by von Hagen and Dahlberg (2004). In this setting, fiscal autonomy of a local government serves as protection for central government against bailout. Local governments that finance the spending out of own taxes are expected to make stronger adjustments to shocks. Central government control will weaken fiscal autonomy at the local level and reduce the central government's protection against bailout.

Central governments all around the world struggle to control the level of local taxation. Two alternative strategies can be observed. One alternative is to have local tax discretion and let local governments be fully responsible for the local tax level. The other alternative is to control the local tax level from above. The role of controls is dealt with in a comprehensive literature on tax limits. Preston and Ichinowski (1991) and Reuben (1997) are representative analyses on US data where regulations vary across states. They conclude that regulations do help to reduce the growth of tax revenues, total revenues and total spending in local governments. Reuben and Poterba (1995) look behind the overall local public growth effects to study how regulation of the property tax has affected employment and wages in the local public sector. They find that regulations have been important, in particular by holding down the wage growth of local government employees. Regulation also is a way of avoiding tax competition. The tax regulations should be seen in relation to regulations regarding deficits and debt, as argued by Rattsø (2002).

Given these mixed arguments for local tax discretion and central government control it is not surprising that all Nordic countries have a mix of discretion and control. Local governments in all countries have freedom to set the income tax rate, but the local discretion varies across countries and time.

4. Tax equalization

The income tax generates substantial local revenue and seems to be a necessary part of the financing when the local public sector is as large as in the Nordic countries. The income tax base is not equally distributed among local governments, differences between top to bottom is about 2,5 : 1 in Sweden, Denmark and Norway, and even more in Finland and Iceland. Differences in local government revenue at this level will generate large and unacceptable differences in welfare services across each country.

The main goal of tax equalization is political, to arrange horizontal equity, in particular equality in service provision across municipalities. The main tradeoff concerns the incentive to stimulate local economic development. If tax equalization is complete, so that local governments with the same (income) tax rate receives the same per capita revenue everywhere, local governments will receive no extra revenue from improving the tax base. Technically the balance between equalization and incentive is affected by the choice of tax rate compensated for. If local governments are compensated at their actual local tax rate, their tax increases are subsidized when their tax base is low. On the other hand, if a tax rate norm is compensated for, local governments will not receive much equalization at the margin. Tax equalization also provides insurance against reductions in tax revenue. Losses of tax revenues due to economic shocks are compensated in the tax equalization. High degree of compensation means high insurance, but also small incentive. The Nordic countries have chosen different solutions to the tradeoffs involved.

Tax equalization also addresses the tax competition problem associated with the income tax. The countries have solved this problem by combining income tax financing with an ambitious tax equalization program. The tax equalization weakens the relationship between the local tax base and local government revenue, and reduces the local autonomy in taxation. Søderstrøm (1990, 1998) emphasizes how tax equalization 'solves' the tax competition problem. The advantage of the tax equalization is that it offsets most of the variation in the tax base. This must be balanced against the disadvantage that incentives to economic development are distorted.

The differences in per capita tax base represent the major source of variation in fiscal capacity. Two local governments using the same tax rate may end up with very different tax revenues per capita if the difference in per capita tax base is large. Moreover, a local government with a low per capita tax base may have relatively low per capita tax revenues even with a high tax rate. And a local government with a high per capita tax base may have relatively high per capita tax revenues even with a low tax rate. The role of tax equalization is to make per capita tax revenues more comparable for local governments using the same tax rate.

Tax equalization may be designed in different ways. A rather general formula is the following

$$TE^j = a \cdot t^* \cdot (TB^R - TB^j) \quad t^* = t^j, t^R \tag{1}$$

where TE^j is the tax equalization grant to local government j, TB^j is it's per capita tax base, TB^R is the reference tax base, t^* is a tax rate, and a the rate of compensation. The reference tax base is typically defined as the average tax base or a fraction thereof. The tax rate t^* could either be the local government's own tax rate (t^j) or a standardized or reference tax rate (t^R) determined by the national government.[1] The rate of compensation determines the fraction of the difference in (calculated) tax revenues that are equalized.

A first alternative is to lift the bottom by providing grants to local governments with per capita tax base below the reference level and to set the tax equalization grant equal to zero for those with tax base above. The tax equalization is asymmetric in the sense that equation (1) only applies to local governments with per capita tax base below the reference level. Another alternative is a more symmetric tax equalization scheme where equation (1) applies to all local government. Local governments with per capita tax base above the reference level will then be contributors, i.e. they receive negative grants. For a given rate of compensation, a symmetric equalization will be more ambitious than an asymmetric one.

[1] The standardized tax rate could for example be the average tax rate in the country.

It is important to emphasize that tax equalization requires a degree of national coordination of local taxes. Tax equalization cannot be carried out in a meaningful way if local governments rely on very different taxes (property, income, wealth, etc) or if they define the tax base in very different ways (e.g. different assessment practice).[2] It makes little sense to provide tax equalization to a local government that has a low property tax base simply because the assessed property value is very low compared to the market value. The most streamlined tax equalization would be based on a national tax system where the tax base is defined and calculated by national authorities, and where the local tax simply is a piggy-back on the national tax base.

Tax equalization raises several efficiency problems that may distort efficiency. As mentioned above, tax equalization weakens the incentives for local development policy by weakening relationship between the local tax base and local government revenue. It is easily seen from equation (1) that the national government will "punish" a successful development policy[3] by reducing the tax equalization grant. Similar arguments can be made with respect to incentives for tax collection and tax assessment.

In addition to equalization of tax revenues, tax equalization also provides insurance. A negative shock to the local tax base is (partly) compensated by grants from the national government. The quantitative importance of the insurance mechanism can be

[2] When there is little national coordination of local tax bases, the so called macro approach (Boadway and Shah 2007, p. xxxix) is a possible way out. The approach would use indicators such as consumption or household income to measure the potential fiscal capacity of local governments. However, available indicators would be imperfect measures of the ability of local governments to raise revenues.
[3] A successful development policy is a policy that increases the per capita tax base (TE^j).

illustrated by utilizing equation (1) to calculate the sum of tax revenues and equalization grants:[4]

$$TR^j + TE^j = t^j[(1-a)TB^j + aTB^R] \tag{2}$$

It is evident from equation (2) that the effective tax base under tax equalization is a weighted average of the local government's own tax base (TB^j) and the reference tax base (TB^R). The insurance towards shocks to the local tax base is higher the higher the rate of compensation. If the rate of compensation is high the tax equalization scheme in effect creates a national insurance pool. The revenues of an individual local government are first and foremost affected by the national tax base, while the development of its own tax base only plays a minor role.

When the national government provides insurance through the tax equalization scheme, the need for precautionary actions by local governments is reduced. In particular the incentives to build up rainy-day-funds to handle periods of low tax revenues are reduced.

It should be emphasized that it is the interplay between tax equalization and the degree of tax financing that determine the incentives for local business development. To see this consider the sum of taxes and equalization grants in equation (2) and take the derivative with respect to own tax base:

[4] For simplicity it is assumed that the tax rate t^* in equation (1) is the local government's own tax rate.

$$\frac{\partial(TR^j + TE^j)}{\partial TB^j} = t^j(1-a) \tag{3}$$

It is evident that the incentive effect depends on both the tax rate and the rate of compensation in the tax equalization scheme. The incentive effect is stronger the higher the tax rate and the lower the rate of compensation. An immediate implication of this result is that systems with very different degree of revenue decentralization may have similar incentive effects. A country with a low tax share[5] and a low rate of compensation can have the same incentive effect as a country with a high tax rate and a high rate of compensation. Sweden is an example of the latter. It is one of the OECD countries with the highest share of taxes in local government revenue, but because of a very ambitious tax equalization scheme the incentive effect as captured by equation (4) is rather low.

5. Tax equalization and distorted tax decisions

Tax equalization may distort the tax level and the tax structure. Tax equalization can be interpreted as a subsidy on local tax increases that may lead to too high tax rates. Moreover, if the equalization does not apply to all local taxes, the local government can increase their tax equalization grant by shifting tax revenues towards the taxes that are equalized. In other word, local governments have incentives to over-utilize

[5] For given responsibilities a low tax rate will be associated with a low tax share.

taxes that are equalized and to under-utilize taxes (and other revenue sources) that are not equalized.[6]

The key concept in understanding incentive these effects of taxation is the marginal cost of public funds (MCPF), which measures the direct and indirect sosial costs of taxation. MCPF gives a measure of how the marginal cost of a public project is affected by the financing. In a first best situation (head tax) the MCPF is 1. Social costs of tax financing raises MCPF above 1.

We use this concept to discuss the effects of tax equalization in a simple model. The role of MCPF is analyzed by Dahlby (2002, 2008) and Smart (1998). We follow the discussion of Dahlberg and Rattsø (2010). The incentive effects of tax equalization depends of the response of the tax base to changes in local taxes. The model includes the local government tax base (TB), revenue (R) and tax rate (t), and subscript j refers to a particular local government. With no tax equalization local government revenue is determined by the tax rate and the tax base. The standard formula of marginal cost of public fund is:

(1) $$MCPF_j = \frac{TB_j}{\partial R_j / \partial t_j} = \frac{TB_j}{TB_j + t_j \partial TB_j / \partial t_j}.$$

[6] The discussion focuses on local governments that are subject to equalization grants, i.e. they have a per capita tax base below the reference level. If the tax equalization is symmetric, the incentives are opposite for local governments with per capita tax base above the reference level. They have incentives to have a too high tax level, to under-utilize taxes subject to equalization, and to underutilize taxes that are not equalized.

The social cost of increasing the revenue by 1 NOK is determined by the response of the tax base to the change of the tax rate. As seen from equation (1), any fall in the tax base due to higher tax rate increases MCPF above 1. If the tax base response is strong enough, the local government tax revenue even may go down (ref: the Laffer curve).

The tax equalization influences the change in local government revenue following a change in the tax rate. We assume that the tax equalization is based on a fixed normative tax rate (tn) and with a fixed compensation level (k). In this case the effect of the tax response is modified:

(2)
$$MCPF_j = \frac{TB_j}{TB_j + \left(t_j - kt_n\right)\partial TB_j / \partial t_j}$$

The effect of the tax equalization depends on the relationship between the actual tax rate and the tax rate compensated for $\left(t_j - kt_n\right)$. If the compensation rate is set to zero ($k = 0$), obviously the tax equalization does not affct the MCPF. When the degree of compensation is positive, the MCPF will be lower than without the tax equalization. It follows that the local government will face a marginal cost that do not reflect the full social costs. In thi case we expect the local government tax rate level to be too high. The tax equalization represents an imperfection so that local governments do not take the full social costs of taxation into account.

We can distinguish between three cases of tax equalizarion: First, the actual tax rate is above the compensated tax rate ($t_j > kt_n$). The tax equalization now compensates for part of reduction in the tax base following a higher tax rate. The higher the compensation rate, the more is compensated in the tax equalization, and the lower the marginal cost of financing as seen from the local government, Second, the actual tax rate is equal to the compensated tax rate ($t_j = kt_n$). In this case MCPF for the local government is equal to 1, and all the reduction in the tax base because of a rise in the tax rate is conpensated. The local government lives in a first-best world, even when tax rate increases distorts resource allocation in the true world.

Third, the actual tax rate can be less than the compensated tax rate ($t_j < kt_n$). Now MCPF is less than 1 for the local government. When the local government increases the tax rate and the tax base is reduced, the tax equalization compensates more than the rduction in the tax base. The local government receives extra revenue when the tax base goes down. The local government clearly has an additional incentive to raise the tax rate when it is over-compensated.

The tax equalization influences the margial cost of public funds also when the tax equalization is based on the actual tax rate. The size of the effect is now only affected by the degree of compensation, since $\left(t_j - kt_j\right) = \left(1-k\right)t_j$. When the compensation rate k is equal to 1, the MCPF is equal to 1. All the reduction in the tax base is compensated. When the compensation rate is less than 1, only part of the reduction in the tax base is compensated. The higher the compensation rate, the more of the tax base reduction is compensated, and the lower is the marginal cost of financing as seen from the local government.

Implicitly we have assumed a first best economy that is distorted by tax equalization. In other situations, when there are already imperfections in the economy, the evaluation of tax equalization may be different. Smart (2009) shows the possibility of an impovement in the social resource allocation with tax equalization when there is tax competition. Tax competition represents a pressure downwards in local tax rates and tax equalization may counterbalance this tendency for too low tax level.

The hypothesis that tax equalization leads to higher tax rates has been investigated in a few studies, notably Buettner (2006) for Germany and Smart (2009) for Canada. The main finding from these and other studies is a positive relationship between tax equalization and local tax level.

Buettner (2006) studies tax equalization in German local governments where the grant can be described by an inverse relationship to the tax base of a local tax base. The tax base is defined by national rules and the tax collection is national. It follows that the local tax decision concentrates to the size of the rate. Buettner calculates a variable measuring how much the tax equalization grant is reduced when the tax base increases. He finds a positive and statistically significant relationship between this variable and the rate of the local business tax. The more local governments are compensated for loss of tax base, the higher the local tax rate is set. The size of the effect if of economic importance.

Smart (2009) analyzes the effects for several different taxes for the 10 Canadian provinces during a period of 30 years (1972-2002). The largest tax is a personal income tax, but the study also includes a business tax, a sales tax and various alchol taxes. To identify the incentive effect he exploits reforms of the equalization system changing the degree of compensation and uses a difference in difference model. Smart shows that an increase in the compensation leads to an increase in the tax rate level and concludes that tax equalization implies subsidization of tax increases.

6. Concluding remarks: Tax regimes

We summarize the paper by discussing three alternative designs of tax regimes. The three models displayed in table 1 differ with respect to the degree of tax financing and the degree of tax equalization, and consequently they perform differently with respect to revenue dispersion, tax rate distortions and incentives for business development.

The first model is the textbook model with highly decentralized financing of local governments, characterized by a high degree of tax financing and little tax equalization. The advantages by the model is that it provides strong incentives for business development and small tax rate distortions, while the disadvantage is substantial variation in revenues due to tax base variation.

Table 1: Alternative tax regimes

	Highly decentralized model	Nordic model	Alternative model
Tax financing	High	High	Low
Tax equalization	Low	High	Low
Revenue dispersion	High	Low	Low
Tax rate distortion	Low	High	High
Incentives for business developm.	High	Low	Low

The local governments in the Nordic countries are responsible for most redistributive services within education, health, and social services. Moreover, it is widely agreed that there should not be too large variation in provision of these services. The Nordic model therefore combines substantial tax financing with ambitious tax equalization schemes. The tax equalization contributes to relatively low revenue dispersion, but comes at a cost in terms of tax rate distortions and weak incentives for business development. Both the tax rate distortion and the weak incentives for business development are due to tax equalization. The tax base distortion reflects that the tax base loss of a higher tax rate is compensated, and the weak incentives for business development reflect that successful business development is punished by a reduction in the tax equalization grant.

The third alternative in table 1 is a model with a low tax share. In the Nordic context this model could be achieved by replacing most of the local income tax with a central government income tax, and where the increased central government tax revenue is used to finance intergovernmental grants. Although local governments become more grant dependent in this model, it can be made (almost) identical to the Nordic model in terms of revenue dispersion, tax rate distortion, and incentives for business development. For revenue dispersion and incentives for business development this is quite obvious; the effects of less tax financing and less tax equalization cancel each other out (see section 4 for incentives for business development). With respect to tax rate distortion, one may at first glance think that the distortions are reduced because less ambitious tax equalization means that tax increases are subsidized to a less extent. However, the tax rate distortion remains the same. The reason is that reduced subsidization of local tax increases is replaced by larger vertical fiscal externality when the central government receives a larger share of the income tax. Local governments will to a less extent internalize the negative tax base effect of tax increases.

The alternative model can be improved with respect to tax rate distortions with thorough tax assignment. Instead of relying on the income tax, local governments could be assigned a (small) tax where the vertical fiscal externality is less severe. One candidate is the property tax that can be an exclusive local tax in the sense that it is not shared with the central government. Although some vertical fiscal externalities will persist, it is not unreasonable to assume that a shift from a shared income tax to an exclusive property tax will reduce the vertical fiscal externalities.

The choice between the Nordic model and the highly decentralized model (or a move in direction of the highly decentralized model) involves a familiar trade-off between efficiency and distribution. More tax financing and/or less tax equalization will reduce tax distortions and improve incentives for business development, but at the cost of increased variation in revenues and service provision.

The choice between the Nordic model and the alternative model is less straightforward. From a narrow economic perspective that focuses on incentives on the margin, the Nordic model (with substantial tax financing and ambitious tax equalization) seems unnecessary complicated. The same marginal incentives (regarding tax rate distortion and incentives for business development) can be achieved by a combination of less tax financing and less ambitious tax equalization. Moreover, tax rate distortions may be reduced by proper tax assignment.

The narrow economic argument above implicitly assumes that the share of taxes in local government revenue is of little importance. However, in a political context the tax share may be important. Jackman (1988, p.7) notes that proposals of less tax financing and less ambitious tax equalization "… has been attacked by political scientists on the ground that distinguishing the total from marginal expenditures is confusing in a political context, and thus may undermine the political preconditions for democratic accountability". We think there is scope for further investigation of the issue of why and how the tax share is important for local democracy and independence of the central government, and possibly also for economic efficiency.

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