ERSA Paper – Extended Abstract

Equity and efficiency impacts of alternative property tax regimes for funding urban infrastructure

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Introduction

A land tax has long been recognised as an efficient tax through which central or local government can fund its expenditures (George, 1879). It is also recognised that a capital value tax (which taxes the value both of the land and any improvement on it) discourages development whereas a land tax has no associated discouragement for development. A land value tax therefore contributes to greater urban intensification relative to a capital value tax (Gemmell et al., 2019). A related literature analyses the properties of a 'betterment' tax based on the uplift (betterment) in property values that may result from a new infrastructure investment (Mill, 1865; Coleman and Grimes, 2010).

This paper analyses equity, as well as efficiency, outcomes that arise when funding a new infrastructure development through these three different types of property tax, i.e. (i) a proportional capital value tax, (ii) a proportional land value tax, and (iii) a betterment tax on land value uplift. The comparison is formulated initially within a partial equilibrium model that takes city population as given. The paper then adopts a general equilibrium approach which examines city level outcomes of an infrastructure investment where that investment is funded either by a land value tax or some other form of tax. The analyses demonstrate not only the efficiency advantages of land value and betterment taxes relative to a capital value tax, but also the equity advantages of a betterment tax over George's 'single tax' on land value.

Background

Many theorists over the past three centuries have recognised that the value of local amenities – both positive and negative – are impounded in the value of land (Quesnay, 1758; Smith, 1789; Ricardo, 1817; Rosen, 1979; Roback, 1982). Taxing land value is, therefore, an indirect way of taxing access to these amenities, many of which are provided by the broader community.

Unlike George (who advocated a flat land value tax), Mill advocated a tax levied only on the increment to land values above the values holding at a particular point in time. The difference between Mill's betterment tax approach and George's land value tax is more subtle than the difference between land and capital value taxes, but these subtleties have not hitherto been well drawn out, especially with respect to equity consequences of the different forms of tax. The partial equilibrium analysis in the next section demonstrates both the equity and efficiency consequences of funding a new infrastructure development through the three forms of property tax outlined above. That section is followed by a general equilibrium analysis that focuses on city development outcomes.

Partial equilibrium model

I illustrate the characteristics of different forms of local government taxes using a model of a town with two types of properties: one situated on expensive land (e.g. with high-quality natural amenities) and the other on low-cost land. I refer to these as 'wealthy' and 'modest' houses respectively. Initially, the number of properties is assumed to be fixed.

To keep the analysis simple, the structure (i.e. 'improvements') on each piece of land is assumed to be identical, so they have identical replacement value (this assumption can subsequently be relaxed.). The total value (capital value) of each property equals its land value plus improvement value. Since the land value is a greater proportion of total value in the wealthy neighbourhood, a land value tax favours the modest households relative to a capital value tax, given a fixed revenue target.

All place-based attributes (both benefits and costs) are impounded in the value of land. Hence, the land price will, inter alia, incorporate the present discounted value of the tax levied on land. Hence any change in the tax rate will affect the market price of land which, in turn, will affect the tax payable. In the analysis, I refer to 'hedonic land value' as the value of land if there were no tax payable, while 'actual land value' (which is what is taxed) is the value of land after accounting for taxes levied on the property.

The base case is one in which a local council needs to raise (present discounted value of) $R in revenue. The improvement value for each house is identical while the hedonic value (and hence capital value) of the wealthy house exceeds that of the modest house.

The council can levy a proportional land value tax to raise the required revenue, or a tax on the capital value of each property. Since land value is a higher proportion of capital value for the wealthy property, owners of expensive land prefer a capital value tax and owners of cheaper land prefer a land value tax.

Urban development

One of the inefficiencies that has been highlighted with respect to capital value taxes is that such taxes discourage development, whether of greenfield sites or for intensification. We illustrate the issues by analysing the consequences if a property owner were to consider adding an extra unit on their land, with the new structure costing $X. The property is only a tiny proportion of the city, so the development decision does not change either the land value tax rate or the capital value tax rate.

With a land value tax, the tax payment of a household following the development (in either suburb) remains unchanged so, provided the developer can find a buyer for the unit who is willing to pay more than $X for it, they will profit by adding the unit.

With a capital value tax, the extra tax paid following an improvement worth $X is $X*$t^c$ where t^c is the capital value tax rate. If there is no buyer who values the addition at more than $X*$(1+t^c)$ no bid will exceed $X; hence there is a reduced chance of making a profitable expansion to the housing stock (Gemmell et al., 2019).

While this constraining effect of a capital value tax relative to a land value tax is well-known, the paper also considers some complications that make the case less clear-cut. These complications include: (1) the buyer valuing the services provided by the council (which increases the likelihood that the developer can find a suitable buyer), and (2) the extra unit causing extra expenses for the council associated with a population increase.

Betterment

Now consider a council infrastructure development which raises the amenity value of one or both properties. The development is funded out of a property tax. The rise in amenity values raises the hedonic value of the land. Assume that the hedonic benefit per property is worth $Z and further assume that the project has a benefit: cost ratio (BCR) of one (again this assumption can be relaxed). The council therefore needs to raise an extra $Z in rates on average per property to pay for the infrastructure.

The effect on tax payments and property values will depend on whether the additional tax is levied on the absolute land and/or capital value, or on the increment to the land value. In this example, a betterment tax results in no change to actual land value or capital value for either property. The reason is that the increased hedonic value of the land is exactly offset by the increased tax burden (Coleman and Grimes, 2010).

With a land value tax, the wealthy property pays more than the increment of $Z in hedonic value because the tax is levied on total land value. Consequently, even though both properties are assumed to share equal hedonic gains from the added infrastructure, the wealthier property suffers a loss in total value whereas the property in the modest suburb gains in value. The logic of the single tax falls short in this case since the added infrastructure cost is levied on the total value of land rather than on the increased (i.e. marginal) value of land. A qualitatively similar result occurs with a capital value tax.

The fact that the land tax remains economically efficient in these cases (since the land is still in fixed supply) is not reassuring. The inequity experienced by the wealthy household – where the extra tax exceeds the benefit to the household of the infrastructure – creates a political economy problem. Households in the wealthy area will oppose developments for which their tax burden increases more than the hedonic value of the development. Given these considerations, the rational opposition of people in wealthy neighbourhoods to development that has city-wide benefits may stifle developments if they are funded by a proportional land value tax (or capital value tax).

The inequity caused by adoption of either a land value tax or a capital value tax to fund new infrastructure (or other new amenities) has not (I believe) been widely recognised in the existing tax literature. Quite simply, Henry George's 'single tax' on land value is not structured appropriately to fund the marginal costs of new council activities.

A formal betterment tax is instead the more appropriate form of property tax for this purpose since, rather than taxing at the average value of land, a betterment tax is a tax

on the marginal value. (A betterment tax is also an ideal tax to employ when dealing with rezoning of land, or prospective, rezoning of land, for instance from rural to urban use.)

General equilibrium model

The reduced form general equilibrium model in Grimes (2020) demonstrates the effect of a city-specific infrastructure development on the city's population, wages and land prices. The model, which builds on that of Overman et al. (2010), comprises three reduced form relationships for: (i) a regional production function, (ii) land prices, and (iii) amenity benefits; in each case the arguments in the relationship are labour and infrastructure.

That model is extended here to show the differential effect of a land tax versus other forms of tax (levied on the local population) for these outcomes. Each tax is used to fund new local infrastructure. While equity issues are not analysed in this representative agent setting, the efficiency advantages of a land tax are again shown through the general equilibrium analysis, with implications for city size and amenity provision.

Contribution

Together, the partial and general equilibrium approaches describe equity and efficiency consequences of adopting different taxation regimes for funding local infrastructure developments. While the efficiency consequences of different forms of property tax are broadly as outlined in past analyses, the equity and city development consequences that are highlighted here extend prior analyses of the economic consequences of different local tax regimes.

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