

David R. Agrawal  
University of Michigan

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## Research Philosophy

My research agenda focuses on the nature and consequences of tax competition and on the analysis of spatial relationships in public finance. My research is both theoretical and empirical. As part of my dissertation, I have worked on topics such as: the optimality of preferential tax zones near international and state borders, whether local taxes rise or fall as a function of distance to the nearest state border, and how vertical externalities vary within a federation if the federal government has multiple horizontal competitors.

### 1 Themes

My research seeks to unify three main themes – tax competition, fiscal federalism, and geospatial economics – into a comprehensive framework. This research agenda was motivated by a desire to incorporate fiscal federalism and spatial relationships into traditional theoretical and empirical models of tax competition by allowing for tax rates to vary not only across states, but within states. If states are allowed to assess multiple tax rates based on geographic locations (such as counties or towns), it is inevitable that the geographic relationships among jurisdictions will be essential to determining the exact nature of the equilibrium. My dissertation suggests that state or international borders can result in otherwise homogenous jurisdictions setting non-uniform tax rates solely because the jurisdictions differ in spatial proximity, which carries the implications that tax incidence and behavioral responses to sales taxes are heterogeneous within a state.

The standard literature on tax competition has primarily focused on models that rely on competition at the same level of government (i.e. states). Only recently has the federal government – and the vertical externalities induced by it – had an active role in these models. Yet, federalism is an essential characteristic of most countries' tax systems. For example, retail sales taxation in the United States is decentralized to the states, which in turn have granted localities and counties taxation authority. In Canada, the provinces and territories have the authority to add additional taxes on top of the federal goods and services tax. Federalism is not only a North American phenomenon. The Indian sales tax system grants states the authority to vary tax rates and tax bases. And even as the European Union has continued to discuss harmonization, country autonomy in setting the Value Added Tax rates remains an important issue. Questions about whether localities and states pursue policies

resulting to a race to the bottom, whether coordination or harmonization of tax rates is desirable, and the implications of tax competition in a “border-free” Europe are fundamental “big-picture” questions outlined in the tax competition literature. Yet, these are questions that I believe cannot be completely answered by the tax competition literature without accounting for fiscal federalism and spatial relationships within states.

In such a context, vertical externalities may be just as central to the literature on tax competition as the horizontal externalities traditionally studied and may depend on the precise relationship between the federal and lower-level governments. In the case of the federal-state relationship, the response of the state government may be vastly different than the town response in the case of the county-town relationship. Inevitably, this is due to the fact that institutional structures restrict states in a very different manner than sub-state governments. Furthermore, as the level of government becomes smaller, the geo-spatial relationships among jurisdictions become more and more important. For example, the assumption that countries compete globally with all other countries may be realistic, but this assumption seems unrealistic for towns. In my work, I suggest that the jurisdiction’s position within a federation and across federations – as measured by distance from the border – is an essential determinant of local tax competition. The analysis of sub-state governments will provide unique data sets and additional instrumental variables to convincingly inform many of the great debates outlined above.

## 2 Methods: Theory and Empirics

Research on tax competition first developed as a theoretical literature. More recently the literature has focused on the estimation of strategic reaction functions. This resulted in the emergence of two bodies of literature that are sometimes disjointed. This highlights my desire to create a unifying framework across both theoretical models and empirical specifications. As a researcher who strives to work in both theory and empirics, I am consistently trying to develop models that are rich enough to be applicable to a world with multiple competitors and multiple levels of government, but that are simple enough to yield sharp and intuitive answers to the big policy debates above. In order for a model to be “rich enough” it must be cast in *spatial* terms with a mobile tax base induced by tax differentials at borders. To create such models, I draw on the theoretical techniques from other fields such as Industrial Organization – in the style of Hotelling and Salop. Additionally, when applicable, the models should have multiple levels of government – ideally with both levels entering actively into the model – which sometimes requires the federal government to play a more passive or assumed role. Of course, adding spatial relationships and multiple levels of government complicate

the already complex problems of uniqueness and existence of an equilibrium in the tax competition literature. As a result, the models I develop often make simplifying assumptions of revenue maximization or assumptions that restrict jurisdictions to competing with only some sub-set of neighbors. I take particular care to think about how the results change when relaxing these assumptions – and if they are critical to the conclusions, determine how to make the model richer.

It is essential that the theoretical models I develop shed light on empirical questions in order to verify the model’s predictions. In studying tax competition, a critical identification issue arises empirically. It must be ascertained whether the pattern of interaction of local governments’ fiscal variables is actually a result of a strategic process or a result of correlated but unobserved spatial shocks to fiscal policy. For this reason, having a grounded theoretical model that sheds light on the specific nature of the strategic interaction is essential. It is important to continually search for new data sets and methodologies that help to identify strategic interaction between governments. As part of my dissertation, I believe I have two such data sets. One data set is a cross-section of all local sales tax rates in the United States. In general, the literature on tax competition has empirically focused on state level interactions. For the United States, this leaves fifty observations with relatively few changes over time in tax policy. By analyzing tax competition using a local data set, I gain a significant amount of power to conduct a thorough and robust analysis. The decentralized data allows me to decompose taxes into municipal, county, and state tax rates – enabling me to also report results for various levels of governments, which is helpful to convince the reader I am truly identifying a strategic interaction. Additionally, I have worked to develop a data set of driving distance to borders. The data I have created with respect to geo-spatial proximity are arguably the most accurate measure of transportation costs to nearby jurisdictions used in the literature. Using this data set, I am able to control for possible heterogeneities with respect to distance – and to accurately measure the transportation cost of cross-border shopping. Such a data set also allows me to decompose the effects of fiscal policies based on a jurisdiction’s spatial position within a federation.

In general, my research utilizes relatively straightforward econometric approaches, which highlight my view that empirical analysis should employ the best techniques without resorting to needlessly complicated methods. As such, I focus on methods that develop intuitive graphical results, but that are robust to a variety of specification changes. At the same time, my papers use high-quality micro-econometric models and rigorous empirical techniques at the frontier of available methods to address issues such as endogeneity. I have enhanced some of the methodologies employed in the empirical tax competition literature. For example, my job market paper develops an empirical methodology that identifies heterogeneous

responses (by jurisdictions, individuals, or businesses) in the presence of discontinuities – or notches – in the tax system. In particular, I outline methods to analyze how responses vary with respect to an entity’s proximity to the discontinuity and with respect to the size of the discontinuity. A second empirical contribution I have made is to utilize multi-level models from political science to estimate reaction functions within a federation. Existing empirical tests do not allow for the coefficients of horizontal and vertical reaction functions to have interaction effects. But, multi-level modeling – and the existing theoretical papers – carry the implication that these interaction effects are essential. Failure to account for these interaction effects will yield to biased estimates.

### 3 Results

If policies vary across jurisdictions, then state or international borders can result in otherwise homogenous jurisdictions setting non-uniform tax rates solely because the jurisdictions differ in spatial proximity to the border. This suggests that the incidence or the behavioral response to taxes are heterogeneous within a state. Although arguments of simplicity and a desire to minimize the behavioral response suggest that sales taxes should be levied broadly and uniformly within a country, my research suggests that the traditional arguments break down when preferences for public goods and tax instruments vary across states. For example, one paper I have written demonstrates that in a world where some states desire higher or lower taxes, states may find it optimal to set preferential rates near borders. My job market paper shows that if states elect to further decentralize the tax system by allowing municipalities to set tax rates, uniformity within a state would no longer occur in equilibrium. The theoretical heterogeneity of tax rates within a state is matched empirically for low-tax jurisdictions. In a final paper, I demonstrate that the magnitude of vertical and horizontal externalities – and therefore the slope of the reaction functions – varies depending on a jurisdictions’ location within a federation.<sup>1</sup>

### 4 Future Research

The future of research on fiscal federalism, tax competition, and spatial relationships has a promising direction and is highly relevant to policymaking in a globalized world. With the database of local option sales taxes in the United States along with the geographic data I have created in ArcGIS, I will be able to extend my research to answer many additional questions.

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<sup>1</sup>A complete dissertation abstract can be found on my Web site describing my papers in more detail.

Over the course of conducting research, I have tried to build expertise on sales taxation. I believe this knowledge will be well served in the coming years. The European Union will inevitably debate policies such as the harmonization of a Value Added Tax across nations and whether or not preferential tax rates at member-states' borders will heighten or reduce tax competition. Within the United States, some states are seeking to expand tax revenues through the use of the sales taxes, and others – including Michigan – have bills in the legislature regarding whether to allow localities to be able to assess local option sales taxes. Presidential commissions for tax reforms – including many economists – have suggested the United States adopt a Value Added Tax. If such a reform were ever to be implemented, I believe I am well situated to assess and to research its implications.

At the same time, my research is not limited or constrained to analyzing tax competition or to analyzing sales taxation. The methodologies and data that I use – both theoretical and empirical – can be used to analyze various policy questions related to whether individuals optimize correctly when deciding to deduct state sales or state income taxes from federal forms or to analyze the incentives induced by the treatment of the rebates in the Cash for Clunkers Program – where a one-mile per gallon improvement in fuel efficiency improved the size of the rebate by one thousand dollars.

Because my research is motivated by optimal tax policies, tax competition, and fiscal federalism, much of my work is highly relevant to public policy questions and debates. My work can shed light on whether allowing further fiscal decentralization is optimal or whether it will trigger intensified competition. It also has implications for the optimal tax mix in the presence of multiple tax instruments and is informative of how individuals' responses to taxes may vary within a state. In fact, many of the methodologies I develop in my job market paper are applicable to analyzing the heterogeneous responses within a state to any type of policy that varies across states – labor policies, environmental policies, etc. As such, I expect my research and the methodologies I strive to improve will contribute to the debate over state, local, and federal tax policies. The ultimate goal for my research is to inform both scholars and policymakers alike.