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Causes and Consequences of Unequal Federal
Taxation and Spending Across Regions:
Dissertation Summary

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Most national governments exercise sovereignty over large geographic areas, comprising a multitude of economically diverse cities and politically heterogeneous regions. Unlike local governments, which typically must spend revenues in the same area in which they are raised, national governments face no such constraints and can effectively redistribute funds from one area to another by letting some areas receive more spending, net of taxes, than others. While an enormous literature has studied the causes and consequences of taxation and spending at the purely national and purely local levels, surprisingly little research has examined how or why national governments may tax and spend differently across different areas.

The first and main chapter of the dissertation explains how a simple federal income tax, levied according to the same tax formula across areas, will fall more heavily on some areas than others, affecting the distribution of employment, wages, and property values nationwide. This happens because otherwise identical workers get paid different wages due to cost-of-living and quality-of-life differences across areas. Workers are effectively taxed for living in areas where firms offer higher wages. According to Roback (1982), when workers are fully mobile, these are areas that are either more efficient in producing goods traded across cities, offer a lower quality-of-life, or have inefficient housing sectors.

The federal tax differences workers pay are simply proportional to the marginal federal tax rate times the wage premium a worker earns for taking a job in a given city, relative to the national average. Since the effective federal marginal tax rate is close to 35 percent, the standard deviation of wage differences across cities is 13 percent (see below), and three-quarters of income accrues to labor, these tax differentials across cities have a standard deviation of about 3 percent of total income. These differences are similar in magnitude to local tax differences, except that higher federal taxes are not compensated for with higher federal spending. This creates a tax wedge that encourages workers to live in low-wage areas rather than high-wage areas, resulting in an inefficient distribution of employment nationwide. Furthermore, less-mobile workers and land owners in high-wage cities disproportionately bear federal taxes and are made worse off than under a system of neutral geographic taxation.

Several policies can be used to alter the distribution of federal taxes across regions, some of which have been suggested, albeit less rigorously, by economists and policymakers. Indexing federal taxes to local wage levels so that work-

ers in different cities have their taxable incomes adjusted to reflect what they would earn in an average city is the proper way to equalize taxes and make employment distributed efficiently. Creating such an index presents a number of practical challenges. The arguably easier task of indexing taxes to cost of living can improve efficiency by helping workers locate closer to good-paying jobs in expensive areas; it can also induce too many workers to live in areas with a high quality of life by effectively subsidizing the consumption of local amenities that lead to higher costs. Cost-of-living indexation will improve locational efficiency only if cost of living varies across cities sufficiently from worker productivity differences rather than from quality-of-life differences.

The chapter also shows that existing provisions in the tax code that lower the after-tax price of owner-occupied housing already act as a mild form of cost-of-living indexation. As the demand for housing is price inelastic, when individuals move to more expensive areas, their expenditures on housing rise. However, as the demand for housing is not perfectly inelastic, housing expenditures rise less than one-for-one with the price level. Because of this, and because not all cost-of-living differences are due to housing costs, these tax provisions only serve to index taxes partially to local costs of living. Furthermore, across areas with the same price level, workers in areas with a higher quality of life earn lower wages (they are in less-productive areas) and thus consume less in housing as well as other goods. Because of this, tax benefits for owner-occupied housing do not benefit workers in nicer areas as much as prices alone would suggest.

U.S. census microdata on individuals and housing from 2000 are used to estimate wage and cost-of-living differences across metropolitan areas in the United States, seen in Figure 3, following a methodology similar to Beeson and Eberts (1989). Calculations from these differences demonstrate that federal tax differences in the United States, seen in Figure 4, are quite large, and that tax-benefits to owner-occupied housing reduce these differences, but only by a small amount. Overall, workers who live in areas offering above-average nominal wages pay an average federal tax rate of almost 20 percent, while otherwise identical workers in cities offering below-average wages pay an average federal tax rate under 15 percent. This difference of roughly 5 percent of total income is higher than many state sales tax rates. The difference between the most-taxed area, the San Francisco Bay Area, and the least-taxed area, rural South Dakota, is almost 14 percent of total income, a difference that swamps almost all local and state tax differences.

An analysis using data from the *Consolidated Federal Funds Report* reveals that cities paying higher federal taxes are not compensated with higher federal spending: federal tax and spending differences across metro areas appear uncorrelated. Thus, unlike higher local taxes, higher federal taxes are particularly burdensome for local economies as they are not compensated for with higher levels of spend-

ing. This analysis bolsters the conclusion of Senator Patrick Moynihan in his 24 years of reports, entitled *The Federal Budget and the States*, that the “federal balance of payments” across areas is highly unequal, showing that this conclusion continues to hold even after controlling for the differing characteristics of individuals across areas.

Using these estimates, a calibrated general equilibrium model—similar in some ways to that in Rappaport (2006)—is used to gauge the long-run effect on metro areas of federal tax differences, present since the two world wars. This model finds that federal taxes have lowered housing and land values by roughly 4 and 25 percent in high-wage cities, while similarly raising values in low-wage areas. Furthermore, based on estimates in Bartik (1991) and other evidence, it appears that long-run employment is about 15 percent lower in both high- and low-wage areas than under a geographically neutral federal tax system. The simulation lends credence to the observation made by journalist Malcolm Gladwell (1996) that “the decline of northeastern American cities may be due... to the emptying of their coffers by the federal government.”

The redistribution of employment across cities caused by federal taxes creates locational inefficiencies worth about 0.28 percent of income, or \$34 billion, in 2005. This efficiency cost is similar in size to the efficiency cost due to tax benefits for owner-occupied housing.

Policy simulations reveal a number of interesting conclusions. First, while wage-indexation of taxes would be superior to cost-of-living indexation, cost-of-living indexation appears to be superior to no indexation at all, even if the tax-benefits to owner-occupied housing are retained. Second, increasing tax-benefits to owner-occupied housing would help to equalize federal taxes somewhat and would lower the efficiency cost due to worker misallocation across cities, but would lead to a welfare loss overall as the efficiency cost increase in the housing-consumption market would be even greater.

The research in this dissertation goes well beyond what the previous literature had discovered about how federal taxes interact with local prices, a literature that is too narrow or informal to guide policy comprehensively. Wildasin (1980) notes that federal taxes on labor income may cause workers to locate inefficiently, but he does not describe this as unequal federal taxation or discuss its impact on local economies. Glaeser (1998) argues that federal transfers should not be tied to local price levels, as this effectively subsidizes workers to live in high quality-of-life cities. Considering also productivity differences across cities, Kaplow (1996) and Knoll and Griffith (2003) argue that there may be a benefit of indexing taxes to local wage levels, but do not provide a quantitative assessment of how this would change things relative to the current unindexed system. The unequal geographic distribution of tax benefits for owner-occupied housing is measured by Gyourko and Sinai (2003), although

they do not consider how these interact with the overall distribution of federal taxes or control for differences in the population across metro areas.

The policy discussion and simulations in this paper provide some guidance to the President’s Advisory Panel on Tax Reform (2005), which recommended cutting tax deductions for local taxes and home-mortgage interest. According to the simulation, this would produce efficiency gains, although it would make federal taxes more unequal across areas and make workers locate even more inefficiently across cities. The simulations are also useful in analyzing the proposal that tax deductions for home mortgage interest be indexed to local price levels. For individuals who consume just over the cap, this would produce a stronger form of cost-of-living indexation, as the size of the deduction increases one-for-one with the price level for housing. This opens up the possibility of capping deductions to keep individuals from consuming too much housing on the margin, while still helping individuals purchase housing close to high-paying jobs.

Also within this chapter are several methodological contributions to the areas of quality of life, amenity valuation, and worker mobility across metro areas. Hedonic estimates of quality of life across cities are measured according to how high the cost of living in a city is relative to its local wage-level. The model used in the dissertation adjusts the standard hedonic model seen in previous work (e.g., Blomquist et al. 1988) to account for federal taxes, nonhousing costs, and nonlabor income. This produces quality-of-life estimates that are much more favorable to cities on the coasts and to larger cities. For instance, Santa Barbara, Honolulu, and San Francisco are ranked in the top five, while previously these had ranked these far lower. Later work (Albouy 2008) shows that these adjusted quality-of-life estimates produce city rankings closer to those in the popular press and that the calibrated model accurately predicts how housing prices rise with wage levels, controlling for amenities. Further empirical analysis reveals that good weather and coastal location alone account for a majority of quality-of-life differences.

A number of insights on how the values of amenities are capitalized into local prices are also developed. These amenities can not only include fixed characteristics such as weather, but also policy variables such as public infrastructure, spending initiatives, and local taxes. Federal taxes increase the local value of amenities that improve quality-of-life or efficiency in the housing sector, while they decrease the value of amenities that are good for businesses that sell goods tradable across cities. Standard formulas used to value amenities need to be adjusted to measure the true economic value of amenities, rather than the local value after changes in federal tax burden. This work also models how amenities are capitalized differently into housing prices than in land prices because housing services are produced using local labor and mobile capital, as well as land. Because land values only make up a fraction of home values, formulas must

take into account that a small percentage increase in housing value will reflect a much larger percentage increase in land value. Also, when land values are not available, amenities that increase the productivity in the tradable sector cannot be readily distinguished from amenities that decrease productivity in the housing (nontradable) sector, as both lead to higher housing prices and wages.

Extension of the model discussed in the Appendix incorporate an elegant adaptation of the Roback framework to account for imperfect mobility, modeled through the heterogeneity of tastes or attachments for living in a particular city. This adaptation uses a single parameter that maps directly to the elasticity of local labor supply, measured in number of employees, or the elastic of demand of households to live in that particular city. Estimates of this mobility parameter can then be used to adjust formulas of how changes in federal taxes or local amenities affect local wages, employment, and land and housing values. The situations where workers are perfectly mobile or immobile are treated as special cases of when the mobility parameter takes on values of zero or infinity.

Of course, reforms to equalize the distribution of taxation and spending across regions require political approval. Most practical reforms would require some areas to receive less in federal funds while others would gain, generating a political conflict across regions. How such conflict is resolved is a common theme in distributional politics. In the United States, equalizing the distribution of federal taxes across areas would likely lead to partisan conflict, as most high-wage areas tend to elect Democratic representatives at the federal level, while many low-wage areas tend to elect Republican representatives, reflecting the so-called “red-state/blue-state” division of the country.

The second chapter of the dissertation considers how the partisan makeup of an area’s federal legislative representatives can influence the type or amount of spending that area receives. The standard legislative bargaining model of Baron and Ferejohn (1987) is adapted to incorporate political parties, which is used to model how power imbalances can arise between majority and minority parties for at least two reasons. First, members of the majority party may have greater ability to propose spending bills, which are destined to favor the proposer. Second, with majority voting and sufficient party-discipline, spending bills can be passed using only votes from members of the majority party, thus excluding members of the minority, who are then less likely to receive distributional benefits. Furthermore, with a breakdown in electoral competition, ideological differences between parties imply that the party affiliation of a representative may influence the composition of spending his district receives, favoring some types of spending over others.

Looking at the U.S. Congress, it is difficult to tease out these different bargaining effects from the data, as the actual bargaining process is more complicated than in a simple

game-theoretic model. Nevertheless, some interesting patterns emerge from the data. Empirical estimates—using within-state variation based on fixed-effect and (quasi-experimental) regression-discontinuity designs—find that states represented by congressmen in the majority receive greater federal grants, especially in transportation. Weaker evidence suggests this greater bargaining power comes more from party-coalition effects than from proposal power differences. States represented by Republican congressmen receive substantially more defense spending than those represented by Democratic congressmen; the latter receive significantly more spending for education.

Until recently, disentangling ideological effects from majority effects had been almost impossible with existing data as Democrats held the majority in the Senate until 1980 and the House until 1994. The only existing work in the area, Levitt and Snyder (1995), is purely cross-sectional, confounding Democratic with majority status, and finds no effect by geographic area. This chapter suggests that partisan representation is important but not overwhelming in determining the geographic distribution of federal funds.

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