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Will the Remote Work Revolution Undermine Progressive State Income Taxes?

Abstract

The remote work revolution raises the possibility that a larger segment of the population will be able to sever the geographic linkage between home and work. What are the taxing rights of states as to nonresident remote workers? May a state impose income taxes on nonresident employees only to the extent they are physically working within the state? Does state taxing power extend to all income derived from in-state firms, including wages paid to those who never set foot in the state? Standard sourcing rules attribute wage income to the employee's physical location. In the presence of remote work, however, rigid adherence to this physical presence rule could intensify the progressivity-limiting dynamics of federalism by reducing the costs to households of exploiting labor income tax differentials across jurisdictions. We document the rise of remote work and the status of state-level income tax progressivity as well as its evolution over time. We consider how alternative legal rules for the sourcing of income can affect telework-induced mobility, but conclude that, regardless of which sourcing regime prevails in coming legal battles, the rise of remote work is likely to limit redistribution via state income taxes. While some sourcing rules may better preserve progressivity in the short term than others, the more fundamental threat to progressive state tax regimes derives from remote work's long-term erosion of the benefits of urban spatial clustering. To the extent that the nation's productive cities lose their allure as centers of agglomeration and the wages of high-skilled workers in these cities fall, the ability of their host states to pursue redistributive tax policies will likely be constrained. These deglomeration effects will arise regardless of how state taxing rights are adapted for the remote work era, and therefore may carry with them implications for income tax progressivity at the federal level.

JEL-Codes: H200, H700, J600, K300, R500.

Keywords: income tax, remote work, sourcing rules, progressivity.

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INTRODUCTION

It is no exaggeration to say that the COVID-19 pandemic has transformed our understanding of how to navigate the world around us. Initially, of course, the reaction of most people – or at least those with the luxury of being able to choose a response – was simply *not* to navigate the world around us. Travel restrictions, stay-at-home orders, mandatory quarantines, and other such public health regulations quite literally restricted human movement across geographic space as millions of Americans sheltered in place to ride out the pandemic.[1]

The pandemic's effects on economic activity are well known and wide ranging: entertainment venues shuttered, online shopping surged, and remote work became the norm for many Americans.[2] These COVID-inspired consumption patterns and work arrangements were of course reactive in nature, initially meant as a temporary response to the public health crisis. It has become increasingly apparent, however, that many of these new patterns and behaviors are here to stay, especially with the emergence of new COVID variants and newfound appreciation that some aspects of online and remote life may not be as bad as expected.[3]

Nowhere is this lasting effect more the subject of public discourse than with respect to the phenomenon of working from home. A simple Google Trends search of "work from home" (WFH) indicates that people are searching for this term at a rate more than triple the level in 2015.[4] Such a search produces millions of results featuring endless commentary on the likely staying power of remote working arrangements.[5] Among these is a fascinating NBER study detailing the reasons for this shift and predicting that "20 percent of full workdays will be supplied from home after the pandemic ends, compared with just 5 percent before."[6] This "remote work revolution," as some researchers have labeled it, portends significant effects across many aspects of social relations and economic life.[7] At one extreme of the remote work continuum, a series of articles in the *New York Times* highlights the rise of the "digital nomad" life—where workers exploit the flexibility of remote work to travel to various states or countries, essentially living out of a suitcase without

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[1] Moreland A, Herlihy C, Tynan MA, et al. *Timing of State and Territorial COVID-19 Stay-at-Home Orders and Changes in Population Movement — United States, March 1–May 31, 2020*, 69 MORBIDITY AND MORTALITY WEEKLY REPORT 1198-1203 (2020) (available at http://dx.doi.org/10.15585/mmwr.mm6935a2external icon).

[2] Realtime data series were developed from data series provided by private companies. See Raj Chetty, John Friedman, Nathaniel Hendren, Michael Stepner, and The Opportunity Insights Team, *The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data,* National Bureau of Economic Research, Working Paper 27431, 2020. The granular real-time are available from the data tracker: https://opportunityinsights.org/paper/tracker/

[3] Association of Legal Administrators, *Remote Working as an Effective Recruitment and Retention Tool for Law Firms Post-COVID-19* (April 2021) (https://www.alanet.org/docs/default-source/whitepapers/ala-white-paper-april-2021-final.pdf?sfvrsn=52133dab_4) pp 15-16, (visited January 6, 2022) (describing preference for remote work, particularly among younger workers).

[4] The December 2015 index for the term is 20, while the January 2022 rate is 65. Not surprisingly, the search rate reached its peak (100) in March 2020. https://trends.google.com/trends/explore?date=all&geo=US&q=%22work%20from%20home%22.

[5] See Dede Henley, *Working From Home Is Here To Stay (For The Better)*, FORBES (June 20, 2021), available at https://tinyurl.com/workfromhomeheretostay (visited July 28, 2021).

[6] Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis, *Why Working From Home Will Stick*, National Bureau of Economic Research, Working Paper 28731 (April 2021).

[7] John Elston, THE REMOTE REVOLUTION: HOW THE LOCATION-INDEPENDENT WORKFORCE CHANGES THE WAY WE HIRE, CONNECT, AND SUCCEED (2017); Tsedal Neeley, REMOTE WORK REVOLUTION: SUCCEEDING FROM ANYWHERE (2021);

a permanent place of residence.[8] According to one recent report, approximately 11 million Americans classify themselves as "digital nomads."[9] This phenomenon suggests that, at least in some instances, remote work has the potential of enabling an even more fundamental untethering of people from place, a development sure to pose new challenges to any legal regime that presumes some linkage between individuals and spatially defined jurisdictions.

In this Article, we examine one of the most noteworthy policy effects of increased reliance on remote work and other such arrangements: the fiscal consequences to state and local governments. Understanding the pandemic's downstream fiscal effects is important for a variety of reasons, not the least of which is ensuring that these governments have sufficient fiscal capacity to respond effectively to future public health crises. Paradoxically, the surge in remote work brought about by COVID-19 has the potential of eroding that capacity, suggesting that the virus may have "long-haul" fiscal consequences in much the same way that it can leave patients with lingering symptoms well after their initial exposure to the disease. While the recency of these developments precludes bold, confident predictions, researchers are increasingly convinced that the rise of remote work could permanently affect incomes, income inequality, and the spatial dimensions of economic activity, with important consequences for city structure. Should these effects materialize, the fiscal consequences to state and local governments would be significant.

The defining feature of subnational taxing powers is *geography*. Because state and local governments are defined by reference to geographical boundaries, their legal authority, including the power to tax, is necessarily limited to persons and activities within those boundaries.[10] Remote work poses a challenge to taxing powers defined by reference to geography, even calling into question the meaning of the word "within" as used in the previous sentence. Viewed at the most basic conceptual level, remote work allows employers and employees to structure employment arrangements without regard to the geographic location of either party. A software engineer living in Tulsa can provide services to her Silicon Valley employer without ever setting foot in California. A New York bank looking to hire investment advisors can expand its search to include candidates working from anywhere in the country, or even the world. These types of remote working arrangements raise the question of *where* the economic activity "actually" takes place and which jurisdiction(s) have taxing rights over that activity. Of course, it was not COVID that made remote working possible; such arrangements have been technologically viable for many years, especially with the emergence of the internet a quarter century ago.[11] But COVID made working from home ordinary and acceptable, a standard—and increasingly common—form of structuring work arrangements.

The most direct fiscal effect of remote work relates to state and local income taxes. In a closed economy in which economic activity never crosses borders, the structure of work arrangements does not implicate the taxing rights of different governments. In a cross-border setting, however, it is necessary to devise legal rules and institutions to determine fiscal obligations arising from activity that spans multiple jurisdictions. In the past, cross-border work arrangements were limited or constrained to activities where individuals physically crossed borders. In certain parts of the country, workers could live in one state (e.g., Connecticut)

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[8] Kristin Wong, *How to Become a 'Digital Nomad'*, New York Times (March 3, 2019); Erin Griffith, *The Digital Nomads Did Not Prepare for This*, New York Times (November 7, 2020); Jenny Gross, *Here's How Moving to Work Remotely Could Affect Your Taxes*, New York Times (August 25, 2020); Jenny Gross, *So, You Want to Become a Digital Nomad*, New York Times (May 26, 2021).

[9] MBO Partners, *COVID-19 and the Rise of the Digital Nomad*, (2020). Available at https://tinyurl.com/nhfc4z65

[10] For case law on state and local taxation, see Walter Hellerstein, Kirk J. Stark, John A. Swain, and Joan M. Youngman, STATE AND LOCAL TAXATION: CASES AND MATERIALS, 11th Edition, (2020).

[11] For an early discussion of these effects, see FRANCES CAIRNCROSS, THE DEATH OF DISTANCE: HOW THE COMMUNICATIONS REVOLUTION WILL CHANGE OUR LIVES (1997)

and commute to another for work (e.g., New York).[12] Extreme versions of this phenomenon included situations such as professional athletes, touring musicians, or film and television actors who work in many states each year.[13] Whereas most households face a linked choice of where to live and where to work, for this subset of taxpayers that linkage is often severed, or at least frayed, enabling them to optimize decisions of where to work and where to live separately.[14] The remote work revolution raises the possibility that a much larger segment of the population will be able to sever the geographic linkage between home and work, and perhaps more critically for state tax law, do so in a way that does not involve physically crossing a border. Such a break in the link between one's work state and home state will no longer be confined to those living in cross-border metropolitan areas such as New York City or to superstars earning income from many states. As more and more workers take advantage of the possibilities offered by remote work, states will face new pressures in the design and implementation of their tax systems.

These new dynamics were on full display in a recent lawsuit brought by New Hampshire against the Commonwealth of Massachusetts in the U.S. Supreme Court. In the early days of the COVID-19 pandemic, Massachusetts adopted regulations subjecting nonresidents to the state's income tax, even if the services were physically undertaken wholly outside of Massachusetts.[15] While these rules were meant to preserve the pre-COVID tax obligations of employees who had been commuting into Massachusetts immediately prior to the pandemic, they naturally raised the question of whether a state could, consistent with federal constitutional limitations, tax the income of workers not physically entering the state. Invoking the Supreme Court's original jurisdiction, New Hampshire challenged this regulation, contending that Massachusetts was powerless to tax the income of those working for Massachusetts employers from their New Hampshire homes. The Supreme Court decided not to hear the case, ensuring that the tangle of issues it raised will remain a source of ongoing legal controversy for the foreseeable future.[16] The Court's refusal to enter the fray now directs the focus to state court litigation, or even possibly Congressional legislation. Whether through litigation or legislation, legal decisionmakers must now confront a handful of core legal questions—i.e., *What are the taxing rights of states as to remote workers employed by firms within the state? May a state impose income taxes on nonresident employees only to the extent they are physically working*

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[12] See, e.g., NYC Planning, *The Ins and Outs of NYC Commuting, An Examination of Recent Trends and Characteristics of Commuter Exchanges between NYC and the Surrounding Metro Region* (September 2019) (available at https://www1.nyc.gov/assets/planning/download/pdf/planning-level/housing-economy/nyc-ins-and-out-of-commuting.pdf). See also *Zelinsky v. Tax Appeals Tribunal of the State of New York*, Court of Appeals of New York, 801 N.E.2d 840 (N.Y. 2003) (upholding the constitutionality of New York's taxation of a law professor resident who worked for his New York employer from his Connecticut home).

[13] For a useful overview of the relevant legal issues, see Jeffrey L. Krasney, *State Income Taxation of Nonresident Professional Athletes,* 47 THE TAX LAWYER 395 (1994).

[14] Not infrequently those decisions are made on an explicitly tax-motivated basis. It is no coincidence, for example, that so many professional athletes maintain their principal place of residence in Texas and Florida, the two largest states without a personal income tax.

[15] 830 CMR 62.5A.3: Massachusetts Source Income of Non-Residents Telecommuting due to the COVID-19 Pandemic ("Pursuant to this rule, all compensation received for services performed by a non-resident who, immediately prior to the Massachusetts COVID-19 state of emergency was an employee engaged in performing such services in Massachusetts, and who is performing services from a location outside Massachusetts due to a Pandemic-Related Circumstance will continue to be treated as Massachusetts source income subject to personal income tax under M.G.L. c. 62, § 5A and personal income tax withholding pursuant to M.G.L. c. 62B, § 2.")

[16] One prominent tax commentator even listed the Supreme Court's *cert* denial in *New Hampshire v. Massachusetts* as one of the "worst tax policy ideas" of the year. *See* Howard Gleckman, *TPC's 2021 Lump Of Coal Award For The Worst Tax Policy Ideas Of The Year*, TaxVox (https://www.taxpolicycenter.org/taxvox/tpcs-2021-lump-coal-award-worst-tax-policy-ideas-year).

within the state? Or does state taxing power extend to all income derived from in-state firms, including wages paid to those who never set foot in the state?

This Article aims to put these legal questions into the broader economic context of whether and how state governments can continue to carry off the century-old project of using state income taxes as a vehicle for progressive redistribution of economic resources. From the early 20th century onward, states have turned to the personal income tax as a pillar of subnational fiscal policy. Progressive reformers began pushing for income taxes in the United States in the late 19th century to address the concentration of wealth during the Second Industrial Revolution. At the state level, the movement for income taxes began in the populist hotbed of Wisconsin, where voters approved a constitutional amendment authorizing the adoption of a progressive state income tax in 1908, five years before ratification of the Sixteenth Amendment to the federal constitution authorizing Congress to adopt an income tax.[17] Unlike the federal government, however, Wisconsin—as well as other key states that followed suit, such as Massachusetts (1915) and New York (1919)—faced an important structural limitation on the ability to operationalize progressive reforms because of the multijurisdictional setting in which they operate. That setting provides taxpayers with another margin on which they can adjust their behavior to minimize (or even eliminate) tax liability: *jurisdictional choice*. This basic feature of federalist institutional arrangements necessarily limits the degrees of freedom available to subnational policymakers in pursuing progressive reforms. Even in an era when remote work was impossible, the availability of jurisdictional choice prompted prominent economists, such as Richard Musgrave and George Stigler, to conclude that progressive redistribution is intrinsically a "national policy" and that the "tenable range" of subnational progressive policy should therefore be regarded as limited.[18]

Despite these admonitions, many state tax systems today are in fact progressive, and some increasingly so, suggesting that other economic forces enable decentralized redistributive policy. Chief among these is urban agglomeration—i.e., the economic benefit to individuals and firms of physical geographic proximity. It is well established that the spatial concentration of economic activity in cities reduces transportation costs, encourages the sharing of knowledge, and provides both workers and firms the benefits of a diversified labor pool.[19] Less appreciated, however, is the effect of agglomerative forces on subnational governments' power to tax. As the lure of cities increases, so too does the "tenable range" of policy options available to state and local lawmakers. In the presence of powerful agglomerative effects, which make people and firms less mobile than in their absence, state and local governments possess a greater ability to carry off progressive tax policies beyond what might have been possible in the absence of these effects.[20] These dynamics help to explain why states like New York and California, home to some of the nation's largest urban centers, also have some of the most progressive state and local tax policies.

Remote work affects the ability of states to pursue progressive tax policies in two primary ways. First and most obviously, remote work has the potential of enabling workers to derive labor income from a high-tax state (i.e., out-of-state employment opportunities) while living in a low-tax state (i.e., working from

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[17] U.S. Const. amend. XVI ("The Congress shall have power to lay and collect taxes on incomes, from whatever source derived, without apportionment among the several States, and without regard to any census or enumeration.")

[18] George Stigler, *The Tenable Range of Functions of Local Government*, in FEDERAL EXPENDITURE POLICY FOR ECONOMIC GROWTH AND STABILITY, JOINT ECONOMIC COMMITTEE, SUBCOMMITTEE ON FISCAL POLITICS, Washington DC, 213-219 (1957); Richard Musgrave, *The Economics of Fiscal Federalism*, 10 NEBRASKA JOURNAL OF ECONOMICS AND BUSINESS 3 (1971).

[19] The idea is typically attributed to Alfred Marshall. *See* ALFRED MARSHALL. PRINCIPLES OF ECONOMICS (London: Macmillan 1890). For a more recent survey, see Edward L. Glaeser and Joshua D. Gottlieb, *The Wealth of Cities: Agglomeration Economies and Spatial Equilibrium in the United States*, 47 J. ECON. LIT. 983 (2009).

[20] See, for example, RICHARD BALDWIN, RIKARD FORSLID, PHILIPPE MARTIN, GIANMARCO OTTAVIANO, AND FREDERIC ROBERT-NICOUD, ECONOMIC GEOGRAPHY AND PUBLIC POLICY (2005) on how agglomeration provides governments with quasi-monopolist taxing powers.

home). We use the word "potential" here because the ability of workers to exploit labor income tax differentials in this manner depends on which sourcing rule applies for labor income from remote work. Standard sourcing rules attribute wage income to the employee's physical location. In the presence of remote work, however, rigid adherence to this physical presence rule could intensify the progressivity-limiting dynamics of federalism by reducing the costs to households of exploiting labor income tax differentials across jurisdictions. An individual can maintain her lucrative job in an expensive urban area but shift her place of residence—and corresponding tax obligations—to a more remote location with lower taxes and a cheaper cost of living. At the same time, an individual living in a cheaper area now has access to the ability to work in an expensive urban area, again augmenting the tax base in low-tax jurisdictions (assuming physical presence sourcing) while depleting the tax base in more expensive, high-tax jurisdictions. It is this issue—i.e., which state has taxing rights over the income of cross-border remote workers—that has been the subject of a growing literature among tax experts as remote work arrangements have become more common.[21]

But remote work could affect the ability of states to pursue progressive tax policies in a second and more fundamental way by changing how cities are structured, how workers are paid, and how taxes and public services are linked. "Remote" work implies geographic separation—a concept that is antithetical to the very idea of urban spatial clustering. As the idea of a geographically separated workplace becomes more common and accepted, agglomeration necessarily loses some of its force. The precise effects of these changes will be hard to predict, but any erosion of agglomeration benefits will have its greatest impact in America's densest coastal states that are funded by more progressive taxes, such as New York and California. Among other things, these effects could include a reduction in the urban wage premium typically associated with agglomeration. To the extent that workers move to suburbs/exurbs with a lower cost of living (potentially in the same state) or to cheaper states, firms no longer need to compensate for high house prices and commuting costs, and as a result, can lower wages for workers who work from home. Indeed, firms like Google and Facebook have already reduced the wages of teleworkers who live in areas with a lower cost of living. The knock-on effects of such developments could be significant. Just as e-commerce lowered the prices of goods and services for brick-and-mortar retailers, remote work could bring with it comparably transformative effects on the distribution of wages. Any downward (or even less upward) adjustment to urban wages would then compromise the ability of states hosting major cities to fund public services with progressive income taxes. Significantly, these effects do not depend on the ability of workers to exploit cross-border labor income tax differentials, but rather spring from changes in the basic economics of city structure. As a result, they are less susceptible to legal interventions such as the specification of wage sourcing rules.

The Article is divided into four parts. In Part I, we document the trends of working from home over the last three decades and then analyze survey data on telework during the COVID-19 pandemic. These data indicate that the effect of telework is extremely heterogeneous across states, industries, income levels, and race, in a way that disproportionally impacts higher-income workers. This point is critical for understanding

[21] See, e.g., Young Ran (Christine) Kim, *Taxing Teleworkers*, 55 UC Davis L. Rev. 1149 (2021), Darien Shanske, *Remote Workforce Doctrine and Policy: Short-Term and Long-Term Considerations*, 12 TAX MATTERS, COLUMBIA JOURNAL OF TAX LAW (2020); Edward Zelinsky, *The Proper State Income Taxation of Remote and Mobile Workers*, 12 TAX MATTERS, COLUMBIA JOURNAL OF TAX LAW (2020), Ellen S. Brody & Cory M. Paul, *In Defense of the "Convenience of the Employer" Test*, 12 TAX MATTERS, COLUMBIA JOURNAL OF TAX LAW (2020), Timothy P. Noonan *Remote Workforce Doctrine and Policy: Looking to the New York Approach*, 12 TAX MATTERS, COLUMBIA JOURNAL OF TAX LAW (2020) . A similar dynamic may affect the ability of states with a high concentration of millionaires, and even billionaires, to tax capital income. Capital income is generally taxed on a residential basis, and just as employees may exploit sourcing rules to avoid taxation in high-tax states, so too may owners of capital shift their residence to minimize state-level income taxes. This means that even if Elon Musk owns and operates a California company, changing his residence to Texas allows him to shift the taxable domicile of all his capital income to a zero-tax state. In other words, telework makes capital income even more footloose in terms of its taxable location.

the effect of telework on the already increasing amount of income inequality in the United States. In Part II, we survey the origins of state income tax systems, which were an outgrowth of the progressive movement in the United States. As we explain, early adopters of the income tax followed a residence principle for the sourcing of income from personal services. In Wisconsin, while non-residents could be required to file a tax return for certain activities in the state, all employment and personal service income was sourced to the earner's state of residence. Massachusetts subsequently extended the residence principle to its purest form: only residents were required to file tax returns. For its first four decades, the Massachusetts income tax did not apply to nonresidents. This residence-based taxation approach began to change, however, when the state of New York implemented a tax system that assigned taxation according to both residence and source, coupled with a tax credit to avoid double taxation. This shift by the state of New York was likely driven by its advantaged position as a net recipient of commuters from surrounding states. Over the next several decades, as more and more states adopted personal income taxes, this "New York model" triumphed, becoming the template for designing state income taxes. The now near universal norm in the American states features worldwide taxation of residents by the state of residence, coupled with source-based taxation in the state of employment, determined by the employee's physical presence. We discuss recent court challenges and precedents related to the taxation of cross-border income, including the "convenience of the employer" test adopted in New York and other states.

In Part III, we turn to the progressivity of state income taxes and the economics of urban agglomeration. Any assessment of state income tax progressivity must take account not only of the statutory tax rates for each state but also exclusions, deductions, credits, and other features of each state's tax system that impact the distribution of income tax burdens. To assess the combined effect of these policies across all states, we simulate the tax payments of 8,944,000 different representative households using NBER TAXSIM.[22] These simulations allow us to construct how the tax burden for certain representative households has varied across income, across states, and over time. We document which state tax systems are progressive, regressive, and flat, along with the historical evolution of these "vertical equity" features of each state's tax system.[23] Our simulations reveal that, over the last thirty years, states can be categorized into one of four groups: (1) states that have increased taxes across the board (i.e., higher average tax rates across the income distribution), (2) states that have decreased taxes across the board (i.e., lower average tax rates across the income distribution), (3) states that have increased progressivity (i.e., higher average tax rates for higher-earners coupled with lower average tax rates for lower-earners), and (4) states that have reduced progressivity (i.e., higher average tax rates for lower-earners and lower average tax rates for higher earners). We also use Part III to examine the relationship between state income tax progressivity and urban agglomeration. While our analysis stops short of making strong causal claims, the data we present confirm the widespread intuition that states hosting significant urban agglomerations tend to have more progressive tax systems. We also identify some important exceptions to this general tendency.

Part III of the Article also addresses how increase reliance on remote working arrangements is likely to alter the behavior of individuals, the pay system of firms, and the way our cities are structured. Here we provide a more detailed analysis of the discussion previewed above—with a particular focus on the mobility of households, opportunities for cross-border employment in a remote work setting, the effect of these dynamics on wages, and the implications these developments may have for the tax systems of jurisdictions

[22] These data are available for public use at https://users.nber.org/~taxsim/. For an early description of the TAXSIM database, see Daniel Feenberg and Elisabeth Coutts, *An Introduction to the TAXSIM Model*, 12 JOURNAL OF POLICY ANALYSIS AND MANAGEMENT 189 (1993).

[23] Jean-Yves Duclos, *Horizontal and Vertical Equity*, THE NEW PALGRAVE DICTIONARY OF ECONOMICS (eds. Steven N. Durlauf and Lawrence E. Blume (2008).

hosting urban agglomerations. While much remains uncertain about how precisely these dynamics will play out, the basic economic forces we identify will be critical for understanding the appropriate design of tax systems, including sourcing rules for multijurisdictional income.

Finally, in Part IV of the Article we discuss various legal and policy reforms to confront the challenges posed by the remote work revolution. We first address the issue of sourcing rules and the system of subnational taxation. We see several options. First, states could do nothing and let the issue fester with no coordinated or uniform approach, resulting in a hodgepodge of taxing rules as is the case in many other subnational fiscal policies. Second, states could tax labor income exclusively based on residence. Third, states could tax labor income exclusively based on source. The relative mobility elasticities of the two tax bases are key. Fourth, states could apportion labor income between the state of residence and the source using a pro rata based on time/days in the state. Finally, we could adopt a single uniform income tax with revenue sharing, either on anyone with multistate income, or on all individuals. We discuss the economic effects of each of these proposals.

Then, we discuss how even the "optimal" sourcing rules will not solve the more fundamental challenges that telework poses for the wage distribution and thus the progressivity of state taxes. Moreover, the effect of telework on wages and employee compensation also affects the ability of the federal government to engage in progressive redistribution. Although state personal income taxes are progressive – and state *fiscal systems* can be even more so due to social welfare benefits provided to low-income houses by state governments – state tax systems are a lot less progressive than at the federal level. The U.S. federal income tax is highly progressive compared to peer countries, and this is in the face of federal explicit and implicit subsidies to state redistribution (e.g., Temporary Assistance for Needy Families, Medicaid, state and local tax deductions, among others). Thus, the compression of the wage distribution, the erosion of agglomeration benefits, and the shift to untaxed fringe benefits due to telework, reduced the ability of the federal government to redistribute incomes even more so than state governments.

We discuss policies that might address each of these more fundamental challenges. First, we define whether the current definition of income for tax purposes is appropriate, or if income definitions need to be expanded to include more fringe compensation. We also discuss whether the condensing of the labor income tax base means that the distinction between realization versus accreditation of capital income becomes more important. Second, we discuss alternative taxes such as the recent wealth tax proposed by the state of California and the tax on billionaires discussed in New York. Finally, we discuss whether, in the presence of remote work, redistributive policy is better resolved via progressivity on the spending side of the budget rather than the revenue side of the budget.

The sourcing rules and policy reforms we discuss here are not just relevant for the United States. Because COVID is a global crisis, it has provided a shock to remote work all around the globe. Thus, our discussion is relevant not just for the U.S. but also, potentially, for other federations around the world that are struggling with how to deal with remote work arrangements and cross-border work. In certain countries these effects are mitigated by existing design features of subnational tax regimes. In Canada, for example, provincial income taxes are applied strictly based on residence. This feature simplifies the remote work calculus since no province other than the taxpayer's province of residence has a claim to tax her income.[24] But at the same time, the analysis in our paper is still relevant to determining if remote work should be taxed according to a residence sourcing rule, and the implications of remote work reducing wages of high-income

[24] Although taxes are residential based, this becomes more complex when thinking about withholding when the employer and the working are in different provinces. In particular, the employer withholds taxes based on the rate in the province the firm is located in, but the worker pays taxes based on the rate where she resides. David Lao, *Working Remotely across the Country or Outside of Canada? What that Means for Your Taxes*, GLOBAL NEWS (August 8, 2021).

taxpayers will also affect the nature of progressive redistribution in residence-based systems. Of course, matters become more complex when international remote work is involved, where the absence of bilateral tax treaties between countries could mean that workers are subject to double taxation in both the country of work and residence. Thus, our analysis has applicability to the international taxation of remote workers and how international tax agreements should be structured, including for cross-border workers within supranational institutions such as the European Union.[25]

Remote work, and the massive structural changes made commonplace by the pandemic, pose important challenges for state tax systems. At the same time, this massive shock provides a policy window to fundamentally change the way states tax income and provide services. If states wish to maintain progressivity, states need to seize this opportunity and use those structural changes as a force for updating tax laws for a new digital and dynamic economy.

I. AN EMPIRICAL SNAPSHOT OF WORKING FROM HOME

As prior work has noted, many of the most important developments in the evolution of state and local taxes in the United States can be traced to exogenous technology shocks requiring adaptation by lawmakers to new economic realities.[26] Changes in technology often create new opportunities for private actors, transforming the nature of economic activity. When tax systems are based on outdated assumptions regarding the nature of economic activity, lawmakers need to take affirmative steps to update statutes to meet ongoing revenue demands and pressures created by technological change. For better or for worse, legislative efforts to update tax statutes rarely keep pace with the rate and scope of technological and economic change. Law reform is an inescapable political process, burdened by the costs of collective action, compromise, and the incrementalism of institutional evaluation. The result is a notable mismatch between actual taxpayer behavior and the assumptions underlying taxing statutes. The former is flexible, adaptive, and ever-changing; the latter, more often than not, is a product of yesteryear.

Perhaps the most noteworthy example of this dynamic from the past century has been the wholesale transformation of household consumption patterns brought about by the rise of "mail-order" houses (e.g., Sears & Roebuck) and, more recently, the arrival of the internet and the corresponding explosion of e-commerce over the past two decades. Analogous to what remote work will do, these changes introduced a new geographic separation between vendors and consumers, with important implications for the design and operation of state and local retail sales taxes. Whereas households previously purchased goods and services that were produced and sold locally, various technological changes (relating to transportation, refrigeration, inventory management, etc.) made transactions between parties separated by space possible, including across state boundaries. Eventually, because of the growth of online giants like Amazon and other digital marketplaces, people could buy goods directly from sellers located anywhere in the United States or world. This new technology-induced reality put pressure on state and local sales tax statutes that were premised on an assumption of local retail trade. The legal response to these technological changes has been incremental and spasmodic, involving state lawmakers, taxpayers, and courts, and persisting over several decades. Even the most recent development in this iterative process—the U.S. Supreme Court's 2018 decision in *South Dakota v. Wayfair*—has not resolved all the open questions regarding subnational taxing rights and cross-border household consumption. In particular, the taxing rights over digital services—such as

[25] European Commission, *Commission Expert Group "Platform for Tax Good Governance*," Working Document (October 7, 2021) (available at: https://tinyurl.com/2p9fp2s7).

[26] See, David R. Agrawal and David E. Wildasin, *Technology and Tax Systems*, 185 J. PUB. ECON. 104082 (2020).

consumption of digital video streaming, digital books, and even two-sided platforms—makes it impossible to determine where the sale originates from or where consumption takes place.

Remote working arrangements present a similar challenge to state and local income tax regimes that are premised on an assumption that employees work and live in the same place. In this case, however, it is not as though the tax system has zero experience with the phenomenon. As we will see, there are numerous examples of cross-border work arrangements and state income tax provisions (e.g., taxing rights, sourcing rules, credit provisions) have long applied to workers with cross-border employment.[27] In this Part, we provide an empirical snapshot of remote working arrangements in the years leading up to the COVID-19 crisis, and then consider how the pandemic shifted those patterns.

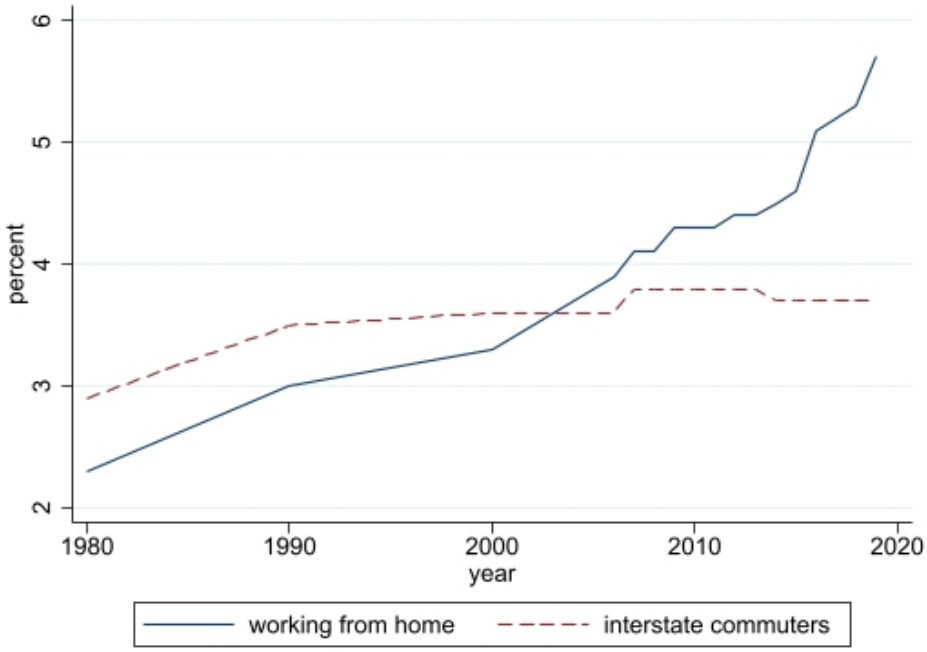
A. Pre-Pandemic Trends in Remote Working Arrangements

The United States Census and, more recently, the American Community Survey (ACS) asks whether each working individual in the household worked from home. Critically, the question does not ask if the individual always worked from home, but rather, if the individual worked from home in the week prior to filling out the Census questionnaire. Of course, teleworkers could be nonresidents or residents, but the Census reporting is based on individuals residing in the state.

Using Census data, we track the growth of working from home using the decennial Census and the one-year estimates of the American Community Survey. As a comparison, we also track the share of individuals that have an interstate commute. Figure 1 reports these results from 1980 to 2019. Interstate commuting has risen moderately from the 1980s, plateauing around 2010, and with minor declines in recent years. Since 1990, the percent of workers with an interstate commute has remained steady between 3.5% and 3.7%. In contrast, WFH has grown steadily over the past four decades, seeing exponential growth in the last five years. Although only 2.3% of individuals worked from home in 1980, this number rose to 4.3% by 2010, and peaks in the last year of data at 5.7%. It is important to note that these years of data do not include the COVID-19 crisis.

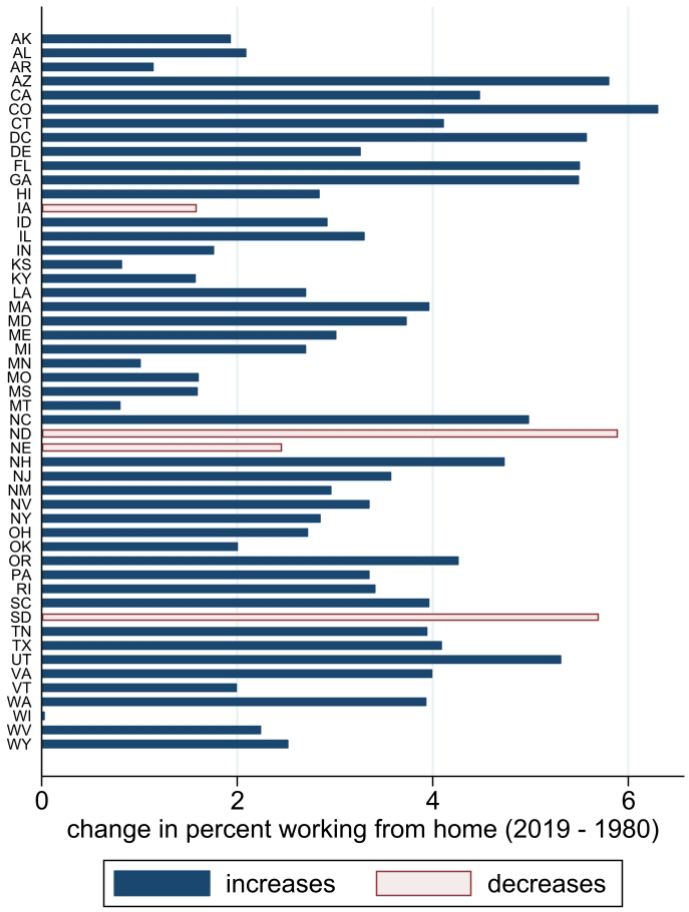
[27] To date, cross-border employment arrangements have been relatively limited, consisting of pockets of interstate commuting (e.g., those living in CT, NJ, PA but working in NY) and select high-profile entertainers and professional athletes.

Figure 1: Percent of Workers at Home and Interstate Commuters Prior to Pandemic



The growth of working from home has increased differentially by state. Figure 2 shows the change in the percentage of individuals working from home from 1980 to 2019 by state. As can be seen from the graph, every state except for Iowa, North Dakota, South Dakota, and Nebraska have seen dramatic increases in the share of individuals working from home. Those four states are outliers because the Census classifies an individual as working from home if they work on the family farm; given the decline in family farming over the last decades, this explains the decreases in working from home found in those states. Colorado, Arizona, the District of Columbia, Florida, and Georgia were the states that had the largest increases in the percent of their workforce at home. This is a function of the industries in these states. More remote and rural jurisdictions have seen smaller increases, but the increase in telework in these states might be larger because those numbers would not also capture decline to family agriculture.

Figure 2: Change in Percentage of Individuals Working from Home by State



Are individuals who WFH high-income or low-income individuals? As a first cut in addressing this question, we note that the 2019 American Community Survey reports that the median earnings of all workers were $40,083, while individuals who WFH have median earnings of $45,576. This suggests that these workers are higher income individuals. But to see the heterogeneity more generally, we decompose the effect by worker earnings in the last twelve months. Figure 3 shows the numbers of individuals working from home in each earnings group.

Of the almost 9 million individuals who worked at home in 2019, one-third of these individuals have earnings more than $75,000. Noticeably, the next most common group consists of individuals with less than $10,000 in earnings (including possibly losses). This latter group may include many self-employed individuals or business earners, who do not pay themselves earnings, but who accrue pass-through income or losses. If so, although lower earnings, these individuals may have a higher total income.

Figure 4 shows the breakdown of workers at home by industry and confirms the concentration of these workers are in service-oriented industries, where managers and workers have a high degree of flexibility to work from home consistently.

Figure 3: Number of Individuals Working at Home by Earnings

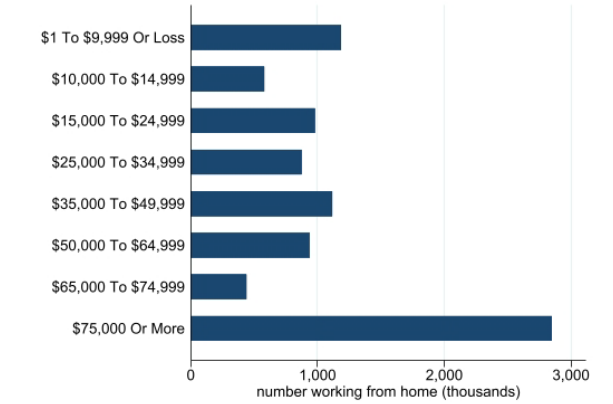
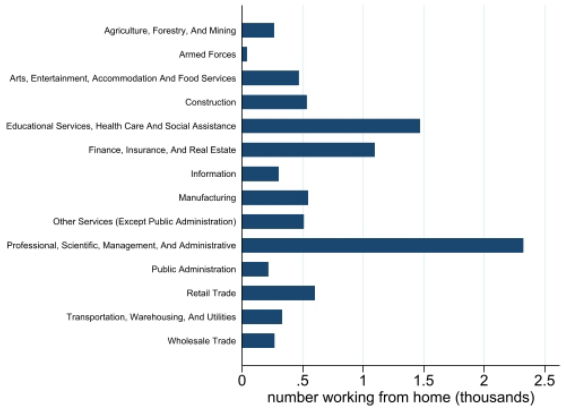


Figure 4: WFH by Industry



B. COVID-19 as a Shock to Remote Work

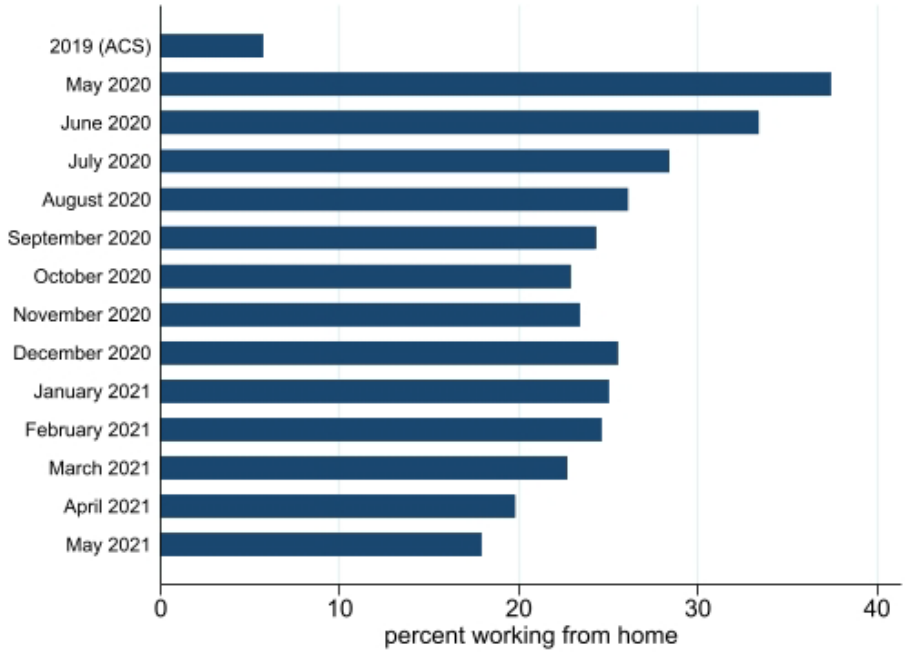
In March and April of 2020, the COVID-19 pandemic led many governors to declare lockdowns and social distancing policies, which reduced capacity in many businesses and encouraged WFH to the extent possible. As a result, many employers allowed their employees to WFHe. Of course, it remains to be seen whether the shock to telecommuting will have permanent consequences, but with several new waves of the COVID-19 epidemic, the transition back to the office may be slower than expected.[28]

To get a better handle on this question, the Bureau of Labor Statistics added several questions to the Current Population Survey (CPS) starting in May 2020.[29] These new CPS questions ask about the extent of telework and whether individuals were unable to work due to the pandemic. In May 2020, already past the peak of the shift to WFH, 37.4% of workers aged 25 and over were teleworking. By one year later, this number had fallen to 17.9%. While a substantial decline has occurred, it bears noting that WFH is still almost triple the pre-pandemic levels of telework, suggesting that even after most states have lifted stay at home orders, work from home orders, and a high share of the population has been vaccinated, many individuals may elect to continue to WFH.

[28] Konrad Putzier and Peter Grant, *Office Occupancy Sputtered in August as Delta Variant Foiled Return-to-Work Hopes*, Wall Street Journal (September 7, 2021).

[29] See the Labor Force Statistics from the Current Population Survey (CPS) available from the Bureau of Labor Statistics: https://www.bls.gov/cps/effects-of-the-coronavirus-covid-19-pandemic.htm

Figure 5: Telework Over Time (Post-Pandemic)



Relating this back to the pre-pandemic breakdown of WFH by income level and industry, might allow us to shed light on if this shock will further amplify the inequities that existed prior to the pandemic. Unfortunately, the CPS does not release data that gives the breakdown based on earnings or income, but it does release information based on educational attainment, and interestingly race. It is well established that both education and race are highly correlated with income.[30] Thus, we can infer from differences in teleworking by education and race that there are also likely to be differences in teleworking by income level. Figure 6 shows the results from the CPS data. As of May 2020, on the education front, only 5.2% of workers with less than a high school education were able to WFH, with this number rising to 25.1% of individuals with some college education. This stands in contrast to workers with advanced degree, where 68.9% of these workers were at home early in the pandemic. With respect to race, whites were six percentage points more likely to be able to WFH than black Americans. These disparities have persisted through the pandemic.

[30] See, e.g., Raj Chetty, Nathaniel Hendren, Maggie R. Jones, Sonya R. Porter, *Race and Economic Opportunity in the United States: An Intergenerational Perspective*, 135 QUARTERLY JOURNAL OF ECONOMICS 711 (2020); George Psacharopoulos and Harry Antony Patrinos, *Returns to Investment in Education: A Decennial Review of the Global Literature*, World Bank Group, Policy Research Working Paper 8402 (April 2018) (available at https://documents1.worldbank.org/curated/en/442521523465644318/pdf/WPS8402.pdf)

Figure 6: Telework by Education and Race (Post-Pandemic)

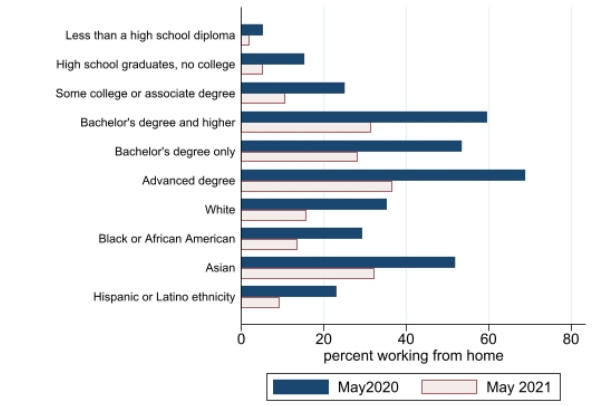
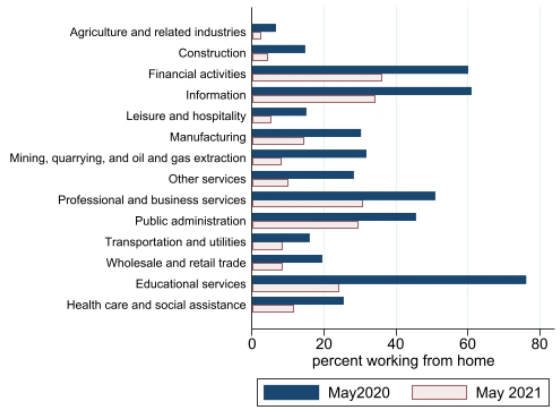


Figure 7: Telework by Industry (Post-Pandemic)



Turning to the results by industry, we can see that the shift to telework disproportionately affected some industries more than others. Some of this heterogeneity is driven by concerns about transmissibility of the virus – such as in the education sector, where in the onset of the pandemic, over 70% of workers shifted to WFH due to concerns about teacher and student health. At the same time, some industries had an easier ability to shift to telework due to prior experience or technological support, such as in financial activities. These two factors may shed light on the enduring nature of the shock to telework rather than others. For example, as public perceptions about the importance of in-person learning relative to health concerns shifted, by one year after the initial lockdowns, the share of individuals working at home in the education industry had fallen by two-thirds. Meanwhile, other industries characterized by an ease of switching to WFH rather than safety concerns saw their shares decline by less than half. Finally, the graph also makes it clear that there are inequities within industries: some sectors such as mining, which cannot conceivably WFH, still have some workers working from home. This signals the pandemic even shifting management and blue-collar administrative jobs in these industries to home.

C. A "Remote Work Revolution"?

An open question is the long-term influence of the pandemic on working from home. A prominent NBER working paper gathered survey evidence and finds that WFH arrangements are likely to persist even after the pandemic subsides.[31] The authors of this study conducted a large-scale survey that suggests 20% of full workdays will be supplied from home after the pandemic ends. The survey evidence points to several reasons for this. First, individuals had a better-than-expected experience of working from home, realizing that it affords a more flexible opportunity to balance work, personal activities, and home activities. Second, the investment in physical infrastructure (computer technologies) and human skills (how to best have a meeting on zoom) have pushed both employers and employees to invest in the fixed costs of these technologies and

[31] Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis, *Why Working From Home Will Stick*, National Bureau of Economic Research, Working Paper 28731 (April 2021).

skills. Many other technological innovations have helped here.[32] Third, the shock to WFH eliminated the stigma of doing so, and instead made it acceptable to attend a corporate meeting virtually rather than in person. Finally, even after the end of the pandemic, there will still be concerns about the contagious risk of being in large crowds or meetings.

At the same time, the survey evidence in this study indicates that major city centers will see a long-term decline of about 5 to 10 percent of economic activity, due to less workers spending money on goods, services, and meals in the city. But the decline of core urban centers may also come with productivity gains, which the study argues will arise in large part due to the time savings of less commuting. Thus, the long run implications of work for home do not just affect where we work from, but also the structure and activity in our cities and the time allocation we make among activities in our day. While survey evidence need not be a fact, the changes in social norms and acceptability of WFH certainly is undoubted. And the ability of the pandemic to spur companies to overcome the fixed costs of online work is also not in doubt.[33]

In the longer term, the rise of "digital nomads" may further transform how we think about the relationship between one's place of residence, her place of work, and the relationship between the two. Even before the pandemic, approximately 5 million Americans classified themselves as a "digital nomad" – i.e., individuals who work remotely, but not from the same place, instead electing to work while engaging in extended travel to different states or locations.[34] The pandemic accentuated the trend in individuals classifying themselves as digital nomads, especially for workers who were without children and able to travel while working at the same time.[35] While many of these might include extreme examples of individuals backpacking while working remotely, the pandemic also created a less extreme example of digital nomads – that also raises complex interstate tax issues – where adult children moved back in with their parents or parents moved in with their children to help with childcare.[36] Again, the pandemic may shape the social normalcy of seeking such help and allow young adults to work remotely while benefiting from being able to live with family. Of course, the digital nomad life raises complex questions, especially when involving extended international travel. But it also raises important state tax issue we will discuss in the conclusion to this paper because these nomads have no well-defined state of residence or domicile.[37]

II. REMOTE WORK AND STATE INCOME TAXATION

Most people live close to their place of work. This prosaic fact of life is chiefly a function of transportation costs. Traveling from home to work and back again, day after day, week after week, carries with it

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[32] See Nicholas Bloom, Steven J. David, and Yulia Zhestkova, *COVID-19 Shifted Patent Applications toward Technologies that Support Working from Home,* 111 AEA PAPERS AND PROCEEDINGS 263 (2021) for evidence on the increase in patent applications that support WFH.

[33] As university professors, both authors on this paper have experienced this firsthand. Like many large institutions, universities have made significant investments in technology to support online learning, ranging from Zoom technologies to classroom equipment to tablets and laptops designed for ease of portability. Moreover, as professors, we have spent a significant amount of time learning how to teach online. These investments of time and money have accelerated the trend in higher education to offer online education programs.

[34] See Kristin Wong, *How to Become a 'Digital Nomad'*, NEW YORK TIMES (March 3, 2019). The idea of a "digital nomad" is not necessarily a new phenomenon; perhaps just the digital part. For example, the famous Hungarian mathematician Paul Erdős essentially spent much of his life, even in the 1950s and 1960s, living out of a suitcase and going to visit different coauthors at different universities around the world, working on research with them.

[35] *See* Erin Griffith, *The Digital Nomads Did Not Prepare for This*, NEW YORK TIMES (November 7, 2020).

[36] *See* Jenny Gross, *Here's How Moving to Work Remotely Could Affect Your Taxes*, New York Times (August 25, 2020).

[37] *See* Jenny Gross, *So, You Want to Become a Digital Nomad*, New York Times (May 26, 2021).

potentially significant burdens, financial and otherwise, that increase with the physical distance between the two locations. As one headline put it, *Long Commutes Destroy Happiness*[38] – a truth that is as self-evident as any other, at least for anyone who has spent hours stuck on the 405 in Los Angeles or the Cross Bronx Expressway in New York. Reasonable proximity between one's work and home reduces these burdens, enhancing the value of both home life and work life – at least for most people.[39]

Happily, the usual geographic linkage between home and work also simplifies the assessment of subnational personal income taxes, at least in the ordinary case where the two locations are in the same taxing jurisdiction. Where only one state is involved, there are no competing (and potentially conflicting) claims of multiple jurisdictions to tax the same income. However, complications arise when two or more jurisdictions have a claim to tax the same income. The multijurisdictional setting raises the possibility of either "over" taxation (if the home state and the work state both assert taxing rights over the same income) or "under" taxation (if parties adjust work or living arrangements to shift income to low- or no tax jurisdictions). The likelihood of either of these outcomes depends on how expansive state taxing rights are, the degree to which states exercise those taxing rights, and the costs associated with efforts to arrange work and living arrangements to minimize tax burdens.

As remote work arrangements increase, so does the possibility that an individual may reside in one jurisdiction and live in another. In previous decades, such cross-border employment was limited to special situations. For example, certain cross-border metropolitan areas (most notably surrounding New York City) span multiple state boundaries. In these areas, it has of course long been the case that someone may live in one state but work in another. In addition, it is common for service providers in certain industries, such as entertainment and professional sports, to live in one state but provide their services in several other states. In some sense, we can conceptualize the rise of teleworking as a development that extends cross-border employment opportunities to a much broader segment of the population, bringing with it the possibility of over- or under-taxation referenced above. However, because teleworking entails *virtual* labor undertaken from afar, it requires no physical connection between the worker and the jurisdiction where the benefit of her services is received. Physical distance between home and work no longer requires hours traveling between the two locations; indeed, the distance between the two becomes nearly meaningless.[40] This possibility of a greater geographic/physical separation between the location where the services are provided (i.e., the remote work site, typically but not necessarily the taxpayer's home) and where they are received (i.e., the location of the employer) intensifies the already difficult problem of sorting out how to tax cross-border employment arrangements. In this Part, we provide a brief overview of how subnational income taxes work in the United States, with an emphasis on the scope of the personal income tax as applied to residents and nonresidents – the key provisions of relevance to cross-border employment arrangements, including telecommuting.

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[38] *See* Minda Zetlin, *Long Commutes Destroy Happiness, Research Shows*, INC. (February 29, 2020).

[39] There are always exceptions, some of them bewildering. *See* Joe Pinsker, *A Mystery of Our Time: The People Who Enjoy Commuting*, The Atlantic (March 17, 2016) (describing individuals who would prefer to *increase* their commute time, including a small number of Canadians who, in a survey conducted by the Canadian government, reported that commuting was the best part of their day).

[40] There is, of course, the issue of people working remotely from different time zones, a topic that has gained greater attention during the COVID pandemic. *See, e.g.,* Shannon McMahon, W*orking across time zones can mean being up at 3 a.m. It's worth it for some travelers*, WASHINGTON POST (September 24, 2020).

A. Origins and Operation of State Personal Income Taxes

Alongside real property taxes for local governments and the retail sales tax for state governments, the personal income tax (PIT) is one of the major workhorses of subnational public finance in the United States.[41] Currently 41 states and the District of Columbia rely on personal income taxes. Each of the nine hold-out states (i.e., Alaska, Florida, Nevada, New Hampshire, South Dakota, Tennessee, Texas, Washington, and Wyoming) has its own history and reasons for not relying on this common source of revenue, but the very fact that such states exist points to a critical organizing feature of U.S. fiscal federalism.[42] More so than any of the world's other federations, the United States is characterized by an extraordinary level of subnational fiscal autonomy.[43] This is not an accidental feature of the American fiscal landscape. From the founding of the nation onward, the states have been largely free to design their tax systems however they choose. Aside from a brief reference to state-level imposts and duties, the U.S. constitution includes no express limitation on state taxing powers. Indeed, in making the case for the new constitution in the Federalist Papers, Alexander Hamilton noted that the document's explicit prohibition on state imposts amounted to "an admission that, if it were not inserted, the States would possess the power it excludes; and it implies a further admission, that *as to all other taxes, the authority of the States remains undiminished*."[44]

This core feature of U.S. fiscal federalism—i.e., the largely unbridled freedom of state governments to decide their own fiscal destiny with little or no interference by the central government – provides the relevant context for understanding the spasmodic emergence of personal income taxes at the state level in the early part of the 20th century. The advent of state income taxes during these years is best described as a process of scattershot experimentalism. There was no centralized plan for the introduction of subnational income taxes; nor was there any coordination across the states. Rather, a handful of states took the initiative of adopting income taxes at a similar time as the federal government in 1913, and gradually over the next several decades more and more states joined the income tax bandwagon. As explained in further detail below, this history is characterized by the triumph of what might be called the "New York model" by the

[41] For example, the personal income tax raises approximately 37% of total state tax revenue, while the general sales tax raised 31% of total tax revenue in 2019. See, Figure 1 in David R. Agrawal and William F. Fox, *Taxing Goods and Services in a Digital Era*, 74 NATIONAL TAX JOURNAL 257 (2021).

[42] Note that New Hampshire has a 5% income tax, but it applies only to interest and dividends. The Granite State does not wages, salaries, or other types of income beyond interest and dividends. For an overview, see https://www.revenue.nh.gov/assistance/tax-overview.htm#interest. The same was true for Tennessee until 2021, when it's "Hall tax" on investment income was repealed. Effective January 1, 2021, Tennessee imposes no personal income tax of any kind (seehttps://www.tn.gov/revenue/taxes/hall-income-tax.html).

[43] Teresa Garcia-Mila, Therese J. McGuire, and Wallace Oates, *Strength in Diversity? Fiscal Federalism among the Fifty U.S. States*, 25 INTERNATIONAL TAX AND PUBLIC FINANCE 1071 (2018) (Examining the fiscal autonomy of US states compared to subnational governments in other federations).

[44] The Federalist Papers: No. 32, The Same Subject Continued Concerning the General Power of Taxation (from the Daily Advertiser), January 3, 1788 (Alexander Hamilton) (available at https://avalon.law.yale.edu/18th_century/fed32.asp) (emphasis added).

second half of the 20th century, i.e., taxing according to both source and residence, but allowing a credit (for taxes paid to other states) to avoid double taxation.

1. The Treatment of Residents and Nonresidents in Early State Income Taxes

a. Taxing Residents: Early Efforts in Wisconsin and Massachusetts

Wisconsin was the first state to adopt an income tax in the modern era, predating the adoption of the federal income tax by two years. Long advocated by progressive reformers,[45] including Robert "Fighting Bob" La Follette.[46] the Wisconsin income tax featured progressive rates ranging from one percent to six percent.[47] For our purposes, a key feature of the Wisconsin law was its specification of sourcing rules – i.e., how and whether the tax would apply to residents with income outside Wisconsin and nonresidents with income within the state. While the early Wisconsin law required nonresidents to pay tax on certain types of income, it also imposed important limitations. Most importantly, the Wisconsin statute specified that all income from personal services was to have a situs determined by reference to the residence of the recipient.[48] Thus, a taxpayer who maintained a residence in Chicago but derived labor income in Milwaukee would not be subject to the Wisconsin income tax.[49] By contrast, if a resident of Wisconsin provided personal services outside of the state, for example by working in Minneapolis, he would be taxed on that income in Wisconsin even though the income was earned out of state. Thus, the early Wisconsin experience with the personal income tax emphasized a *residence* principle for the sourcing of labor income. Residents alone were subject to tax on personal service income. While non-residents could be required to file a tax return in the state, their only source of income would be income derived from real property located in the state or any portion of business income that was apportioned to the state. Neither labor income nor any other personal service income of nonresidents was subject to tax in Wisconsin.

It is not entirely clear from the historical record why the Wisconsin income tax treated labor and service income as taxable based on the residence principle. One explanation is that the legislature simply adopted design features of the tax that suited the administrative capacity of Wisconsin government at the time of enactment. Requiring residents of Illinois or Minnesota to file Wisconsin tax returns to pay tax on labor or personal service income derived in Wisconsin may have seemed infeasible at the time, or not worth the effort given the (negligible) amount of cross-border work in the Upper Midwest during those years. Another explanation is normative – a belief that taxation *should* be residence-based since the principal beneficiaries of Wisconsin government spending would be Wisconsin residents. This view was expressed by Thomas Sewall Adams, a widely respected tax policy analyst of the era and chief architect of the Wisconsin income

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[45] John D. Buenker, THE INCOME TAX AND THE PROGRESSIVE ERA (1985).

[46] LaFollette was governor of Wisconsin until 1906. John D. Buenker, *Robert M. LaFollette's Progressive Odyssey*, 82 THE WISCONSIN MAGAZINE OF HISTORY 2, 30 (1998). On the question of Wisconsin being the "first" state-level personal income tax, note that Hawaii adopted an income tax in 1901, a full decade before Wisconsin; however, it was not a state at the time it adopted its income tax. See TAX PROBLEMS AND FISCAL POLICYIN HAWAII 1 (1962) (available at https://lrb.hawaii.gov/wp-content/uploads/1962_TaxProblemsAndFiscalPolicyInHawaii.pdf) (describing introduction of income tax in Hawaii in 1901).

[47] Particularly interesting treatments can be found in W. Elliot Brownlee, Jr. *Income Taxation and the Political Economy of Wisconsin, 1890-1930*, 59 THE WISCONSIN MAGAZINE OF HISTORY 299 (1976), as well as Ajay K. Mehrotra, *Forging Fiscal Reform: Constitutional Change, Public Policy, and the Creation of Administrative Capacity in Wisconsin, 1880–1920*, 20 JOURNAL OF POLICY HISTORY 94 (2008)

[48] "In determining taxable income, … income from personal service… shall follow the residence of the recipient."

[49] Interestingly, the determination of the taxpayer's residence was made as of December 31 of each year. Thus, even if the individual earned most of his income in Wisconsin while a Wisconsin resident, he would not be subject to Wisconsin tax on that income if he moved to Chicago before the end of the year. HENRY B. NELSON, THE WISCONSIN INCOME TAX (page 29)

tax. Adams was a public finance economist who would later join the faculty of Yale University and serve as a tax advisor to the U.S. Treasury during and after World War I.[50] In a lengthy post-mortem discussion of his work on the Wisconsin income tax, Adams noted the tax arose out of the growing dissatisfaction with the property tax, which over time had become more of a "tax on things." This development was "not altogether salutary," Adams observed, since "[t]he property of many persons of wealth is situated in jurisdictions other than that in which they reside."[51] By contrast, the income tax would be more a "tax on persons" – a much more commendable feature, Adams suggested, given the taxpayer's "fiscal allegiance to the jurisdiction in which their persons are protected and their children are educated."[52]

Adams had elaborated on the idea of "fiscal allegiance" in an earlier essay addressed to economists in the American Economic Association and published in the *American Economic Review*, one of the leading journals in the field of economics.[53] Here Adams addressed the idea with a bit more gusto, noting that "Nowhere in the world over a large territory within my knowledge is there any sign of the abandonment of the principle that men owe a personal fiscal allegiance to the state and that *they ought to pay some taxes in the district in which they live*…"[54] Moreover, Adams asserted, "[t]he personal income tax which a man pays at his place of residence ought so far as possible to be measured by his ability, as reflected in his net income from whatever source derived, either within or without the jurisdiction in which he lives; and, according to the preponderance of testimony, ought if practicable to be progressive."[55] At bottom, Adams saw the income tax, at least insofar as it applied to a state's own residents, as "the human obligation of a man as a member of the body politic."[56] This idea of "personal taxation," arising from membership in a political community, was distinct—at least as far as Adams was concerned—from "business taxation" the justification for which was the commercial opportunity made available to business owners.[57]

The Massachusetts personal income tax, enacted in early 1916, took the residence principle one step further than did Wisconsin.[58] Under the Massachusetts approach, *only* residents were required to file tax returns. The tax did not apply at all to nonresidents. The reason for this limitation likely relates to the more limited scope of the Massachusetts tax base, as compared to Wisconsin.[59] Whereas the Wisconsin law required nonresidents to pay tax on income derived from Wisconsin real estate, the Massachusetts law exempted this category of income entirely (for residents as well as nonresidents), most likely on the grounds that taxing both the property itself (via the property tax) and the income derived from that property would constitute objectionable "double" taxation. The limitation of the income tax to residents remained a feature

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[50] Michael Graetz and Michael O'Hear, *The "Original Intent" of U.S. International Taxation*, 46 Duke L. J. 1021 (1997).

[51] T.S. Adams, *The Significance of the Wisconsin Income Tax*, 28 POL. SCI. Q. 569 (1913).

[52] Id. at 569.

[53] T.S. Adams, *The Place of the Income Tax in the Reform of State Taxation*, AMERICAN ECONOMIC REVIEW 302, 307 (1911).

[54] Id. at 307-308 (emphasis added).

[55] Id. at 315-316.

[56] Id. at 316.

[57] Id.

[58] The tax was enacted in 1915 but did not take effect until 1917. Charles J. Bullock, *The Taxation of Property and Income in Massachusetts*, 31 THE QUARTERLY JOURNAL OF ECONOMICS 1, 50 (1916).

[59] The early Massachusetts tax applied to only four categories of income: (1) income from intangibles, (2) income from annuities, (3) net gains from dealings in intangibles, and (4) income from professions, employment, trades, or businesses. Notably absent from this list is income from real property. PHILIP NICHOLS, TAXATION IN MASSACHUSETTS: A TREATISE ON THE ASSESSMENT AND COLLECTION OF TAXES, EXCISES, AND SPECIAL ASSESSMENTS UNDER THE LAWS OF THE COMMONWEALTH OF MASSACHUSETTS 428 et seq (Second Edition 1922). The operative language of the statute indicated that a tax of 6% was required to be paid on income from the specified categories "received by an inhabitant of the commonwealth during the preceding calendar year." Id. at 436.

of Massachusetts law until 1955. Thus, for the first 40 years of the Bay State income tax, any nonresident deriving labor income from the state would not be subject to income tax in the state.

Significantly, neither the Wisconsin tax nor the Massachusetts law featured one of the key provisions that are set forth in modern personal income taxes: a tax credit for taxes paid to other states. The purpose of such credits is to minimize the likelihood of double taxation. The most likely explanation for the absence of a credit provision in the early Wisconsin and Massachusetts statutes was the fact that taxpayers were unlikely to face double taxation – likely because the surrounding states had yet an acted income taxes. In the case of Wisconsin's border states, for example, personal income taxes were not introduced in Minnesota until 1933, Iowa in 1934, Michigan in 1967, and Illinois in 1969.[60] States surrounding Massachusetts adopted personal income taxes earlier, though the Bay State was a first mover on that front for the New England region. But the absence of a credit for residents subject to the income tax exposed residents of Wisconsin and Massachusetts to the risk of double taxation. If the taxpayer had income that was earned and taxed in a state where he was not a resident, that tax would have to be paid in addition the income tax in his home state.

b. Taxing Nonresidents: Oklahoma and New York

Another early adopter of the personal income tax, Oklahoma, followed a markedly different approach from Wisconsin and Massachusetts. The Sooner State adopted a personal income tax in 1915, following a brief but unsuccessful experimentation with an income tax it had enacted in 1908 shortly after the state entered the union.[61] The 1915 version followed the new federal income tax in terms of the scope of the tax, adopting a broad definition of income. Like Wisconsin, Oklahoma taxed the income of its own residents, whether that income was earned in Oklahoma or outside the state. However, unlike Wisconsin and Massachusetts, Oklahoma also required nonresidents to pay income tax on their Oklahoma source personal service income. Recall that Wisconsin had adopted a source rule specifying that income from personal income was to have a source based on the worker's residence (essentially a residence-based income tax for personal service income), while Massachusetts did not require non-residents to pay tax on any Massachusetts-source income. Thus, with the adoption of its 1915 legislation, Oklahoma became the first state in the nation to tax the labor or personal service income of non-residents.[62] This feature of the Oklahoma tax raised an additional risk of double taxation – i.e., the possibility that a nonresident earning income in Oklahoma would owe income tax to her state of residence (e.g., Wisconsin) as well to Oklahoma. Like Wisconsin and Massachusetts, Oklahoma provided no credit for taxes paid to other states. Again, however, the risk of double taxation at this time was reduced by the small number of states having adopted income taxes (as well as the small number of taxpayers operating in two or more of such states).

The Oklahoma personal income tax is important not just because the state was an early adopter of this important fiscal innovation, but also because it drew the attention of the U.S. Supreme Court in one of the earliest and foundational decisions on state personal income taxes, in the famed case of *Shaffer v. Carter*,

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[60] Scott Drenkard and Richard Borean, *When Did Your State Adopt Its Income Tax?* TAX FOUNDATION (June 10, 2014) (available at https://taxfoundation.org/when-did-your-state-adopt-its-income-tax/)

[61] J. Freeman Pyle, *The Taxation of Incomes in Oklahoma*, 30 J. POL. ECON. 709 (1922). *See also* ALZADA COMSTOCK, STATE TAXATION OF PERSONAL INCOMES 62 (1921) (noting that the original Oklahoma income tax "was unquestionably a failure" and that the law "was unpopular with the taxpayers, the machinery for enforcement was lacking, and the returns were negligible.")

[62] We note that Mississippi technically adopted an income tax in 1912, but the administrative machinery for the tax was so lacking that the state never raised more than $25,000 in the early years of the tax. COMSTOCK at 57 (noting that the Mississippi income tax was "handicapped at the beginning" owing to the absence of administrative machinery to implement the tax).

decided by the Court in 1920.[63] In that case, Charles B. Shaffer, a resident of Illinois, was engaged in the oil business in Oklahoma, operating several mining leases in the state and holding title to certain oil-producing land. Under the terms of the state's 1915 legislation, Shaffer owed tax on the income he had derived from these activities, but he claimed that the federal constitution precluded extension of the tax to him as he was not a resident of the state. Justice Pitney rejected this argument, noting that "just as a State may impose general income taxes upon its own citizens and residents whose persons are subject to its control, it may, as a necessary consequence, levy a duty of like character, and not more onerous in its effect, upon incomes accruing to non-residents from their property or business within the State, or their occupations carried on therein."[64]

Looking back on *Shaffer v. Carter* with the benefit of hindsight, Justice Pitney's opinion seems unremarkable. From a modern day perspective, it seems positively self-evident that Oklahoma has the constitutional authority to impose an income tax on nonresidents exploiting commercial opportunities in the state. Who (other than Shaffer himself) would seriously suggest that a state is powerless to regulate economic activity within its borders? On the other hand, it is worth taking note of how significant this decision was for the design and operation of American fiscal federalism, especially as compared to standard rules in operation in most of the world's other federations. In Canada, for example, provincial income taxes are based exclusively on the taxpayer's residence. A resident of Vancouver who works in Toronto owes provincial income tax only to her home province of British Columbia, and none at all to the "source province" of Ontario.[65] This residence-based approach is a commonplace feature of subnational income taxes throughout the world.[66] Thus, Oklahoma, by both enacting its income tax in 1915 and prevailing in its case before the Supreme Court in 1920, helped to cement a distinct feature of U.S. fiscal federalism – i.e., the power of subnational governments to impose personal income taxes on persons other than their own residents. That critical legal development would gain even greater momentum with the adoption of an income tax in New York in 1919.

The entry of New York into the PIT arena changed everything. As the wealthiest state in the country, New York had many high-income residents who derived income from sources outside of the state. In addition, however, there were also already many residents of neighboring states (particularly New Jersey, Connecticut, Pennsylvania) who were deriving income from working in New York City. Public finance economist Edwin Seligman, a well-regarded progressive economist and primary architect of the 1919 New York income tax legislation, emphasized these two features of the New York economy and their implications for the design of the tax.[67]

In an essay published as the New York legislation was being finalized, Seligman addressed at length the proper treatment of nonresidents in the state's new income tax.[68] Seligman's discussion centered on the

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[63] *Shaffer v. Carter*, 252 U.S. 37 (1920) (opinion by Justice Pitney).

[64] Id. at 52

[65] Making things even simpler, the federal government (acting through the Canada Revenue Agency) collects the entire amount of the Vancouverite's income tax, remitting the province's portion back to revenue officials in British Columbia.

[66] See, e.g., David R. Agrawal and Dirk Foremny, *Relocation of the Rich: Migration in Response to Top Tax Rate Changes from Spanish Reforms*, 101 REVIEW OF ECONOMICS AND STATISTICS 214 (2019) (describing Spain's system of residence-based subnational income taxes); *see also* Steven D. Gold, *Scandinavian Local Income Taxation: Lessons for the United States?* 5 PUBLIC FINANCE QUARTERLY 471 (1977) (providing description of residence-based local income taxes in Norway, Sweden, and Denmark); *see also* Beatrix Eugster and Raphaël Parchet, *Culture and Taxes* 127 JOURNAL OF POLITICAL ECONOMY 296 (2019) (providing description of residence-based local income taxes in Switzerland).

[67] Edwin R.A. Seligman, *The Taxation of Non-Residents in the New York Income Tax*, 5 BULLETIN OF THE NATIONAL TAX ASSOCIATION 40 (1919).

[68] Id.

potential for double taxation where a taxpayer resides in one state but works in another. The first solution to this problem he discusses is taxation only by the state where income is earned. Assuming uniform source rules, this approach avoids double taxation by precluding taxation by the state of residence. The chief flaw in this approach, as Seligman saw it, was that surrounding states had not adopted yet income taxes. Their failure to do so, coupled with New York's new tax, created an inequity. Two New York residents earning the same income from similar professions would be subject to different levels of tax simply because one of them earned that income in New York, where the income would be taxed, while the other earned it in a neighboring state without an income tax. The second solution Seligman discussed was that "[r]esidents might be taxed on their entire income and non-residents might go scot-free."[69] Here again, however, another inequity arises from New York's first-mover status as "there is no assurance that the other state will impose an analogous income tax, in which case residents will be subject to a disadvantage."[70] That is, two otherwise identical taxpayers, earning the same amount from the same job in New York City, would face different tax burdens simply because one was a resident of New York and the other was a resident of some neighboring state. Why, Seligman asked, "should the New Yorker who is pursuing his occupation side by side with the Jerseyite be put at this manifest disadvantage?"[71]

To avoid both of these inequities, the only solution would be to employ *both* the residence principle (for residents) *and* the source principle (for nonresidents). That is, New York would tax residents on their worldwide income, whether derived from within or without New York and tax nonresidents on their New York source income. Of course the difficulty with this approach, as Seligman was quick to note, was that "if two states impose a similar tax and follow the same principle they may create cases of unjust double taxation." For example, " if individual A earns his money and spends it in one state, he would be taxed only once on his entire income; while B, with the same income, who earns his money in one state and has his legal residence in another, will be taxed twice, once by the state where the income is earned and again by his state of residence."[72] Seligman recognized such double taxation as intolerable but proposed a technique for avoid it.

Seligman's solution to the double taxation problem was to include in the legislation a tax credit, available to any nonresident paying New York income tax on her New York source income, equal to the same proportion of income tax that the nonresident paid to his state of residence as his New York source income bears to his total income. Thus, if a Jerseyite earned $100,000 total income, but only $40,000 of it in New York, he would be (1) subject to New York income tax on his $40,000 of New York source income, but also (2) entitled to a credit against that amount equal to 40% of his New Jersey income tax liability.[73] The

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[69] Id. at 47.

[70] Id.

[71] Id.

[72] Id. Students of U.S. constitutional doctrine concerning state and local taxation will recognize Seligman's concern as an illustration of the so-called "internal consistency test," which posits that all states adopt an identical version of the taxing statute under scrutiny and then asks whether interstate transactions would be subject to a greater tax burden than purely intrastate transactions. For an early application of the concept, see Pullman's Palace-Car Co. v. Commonwealth of Pennsylvania, 141 U.S. 18, 26 (1891) (noting that if the challenged assessment "were adopted by all the States through which these cars ran, the company would be assessed upon the whole value of its capital stock, and no more."). The seminal work on the internal consistency doctrine is from Walter Hellerstein. *See* Walter Hellerstein, *Is "Internal Consistency" Foolish?: Reflections on an Emerging Commerce Clause Restraint on State Taxation*, 87 MICHIGAN L. REV. 138 (1988).

[73] For an example with tax rates, assume New York imposes a 7% tax, such that the taxpayer's New York income tax liability, before the credit, is $2,800 ($40,000 x .07), while New Jersey imposes a 5% tax, such that the taxpayer's New Jersey income tax liability is $5,000 ($100,000 x. .05). New York would allow a tax credit of $2,000, thereby reducing the taxpayer's New York income tax liability from $2,800 to $800. Note that the primary effect of this credit is to (1) eliminate double taxation to the extent that the rates are the same (but not as to the rate differential), and (2) to cede the resulting revenue to the state of residence.

operation of this credit was subject to two very important qualifications, one legal and one practical. First, the New York statute made availability of the credit to nonresidents expressly conditional on New Yorkers being able to claim a similar credit in other state. If New Yorkers were not entitled to such a credit in, say, Pennsylvania, then Pennsylvanians would not be entitled to the New York credit. This provision was obviously designed to induce reciprocity, but it was overwhelmed in significance by the second qualification: none of the states surrounding New York, from which the vast majority of nonresidents working in the state were commuting, even had income taxes in place at the time New York adopted this legislation. Thus, in an important practical sense, the availability of this nonresident credit was essentially meaningless. Commuters into New York from New Jersey, Connecticut, Pennsylvania, etc… would be subject to the New York income tax and would be entitled to a tax credit of exactly $0 since their states did not impose income taxes.[74] There would be no double taxation for these people, but not because New York's nonresident credit eliminated their tax obligation, but rather because their home states imposed no income tax for which New York could even grant a credit. The result was that New York alone was taxing their income.

At this point, it should be apparent that New York—a worldwide center of economic activity involving citizens from many different jurisdictions—was laying claim for itself a vast tax base, consisting of the worldwide income of its own residents, as well as the New York source income of nonresidents. That said, in theory at least, the Seligman-designed income tax model adopted in New York was in one important sense an extension of the "residence-based" approach utilized in Wisconsin and Massachusetts. Because Seligman's credit was made available to *nonresidents*, it was essentially conceding (in any situation it would apply) that, in cases of possible double taxation, the state of residence would have a tax claim superior to that of the source state. If and when neighboring (or other) states chose to impose an income tax on their own residents, the New York nonresident credit would ensure that (1) residents of those states who were earning income in New York would only be taxed once, and (2) the revenue from that single tax would accrue to their state of residence, not New York. In this sense, New York's income tax, even though it extended to nonresidents, also reflected a commitment to the priority claim of the state of residence.

For better or for worse, this element of the New York income tax law favoring residence states came completely undone during the middle years of the 20th century, when New York repealed its nonresident income tax credit and replaced it with a credit available only to New York residents for taxes paid to other states. The full motivation for every legislative act is difficult to discern, but in a nutshell what happened was that New Jersey enacted a tax in 1961—colloquially known as the "commuter benefit tax" but formally titled the "Emergency Transportation Tax"—which applied only to New Jersey residents working in New York and New York residents working in New Jersey. At that point New Jersey still had not adopted a personal income tax – and indeed would not do so until 1976. This special commuter benefit tax applied *only* to the narrowly defined categories of NJ/NY commuters. The not-so-secret rationale for this oddly limited tax was to divert to New Jersey income tax payments that its residents would otherwise make to New York. In effect, New Jersey was seeking to take advantage of the nonresident tax credit in New York law. Indeed, the only purpose of extending he ETT to New York residents working in New Jersey was to ensure compliance with the reciprocity provision described above. New Jersey was seeking to reclaim tax revenue its residents were paying to New York that many felt should have been paid to New Jersey. As counsel to the New Jersey governor put it, "We are not getting something which doesn't belong to us. We

[74] The only New York border state with an income tax at the same time was Massachusetts, which as noted above adopted a purely residence-based income tax in 1915, a few years before the adoption of New York's income tax. We are not aware of any data regarding the extent of Massachusetts residents working in New York in these early years.

are not getting $40 million for nothing. We are simply 41 years late getting what we should have gotten all the way along."[75]

Whatever hopes New Jersey may have had for laying claim to what they regarded as rightfully theirs were quickly dashed. Shortly after New Jersey's enactment of its commuter benefit tax, New York repealed its nonresident tax credit, at which point the only New York tax credit for taxes paid to other states was available to New York residents for income taxes paid to other states. At the end of the day, the bottom-line effect of the fiscal dustup was to fortify the New York tax as a system favoring "source" states. Once the nonresident credit was repealed, the basic rules of operation were as follows: (1) any nonresident working in New York would owe income tax to New York, with relief from double taxation available only if her state of residence provided a credit, and (2) any New Yorker subject to income taxation in other states would be relieved from double taxation by New York's credit for its own residents, a credit that effectively ceded revenue to the source state.

2. The Triumph of the "New York Model" Favoring Source States

By the mid-1970s, nearly all states with a personal income tax had adopted some version of what might be termed the "New York Model" for a state personal income tax developed in the Empire State over the four decades from 1919-1961. This of course was a period of extraordinary, even epic economic change in the United States, featuring two world wars, the Great Depression, the New Deal, and the apex of American economic power in the years following the end of World War II. It was also an era marking the phenomenal rise of America's great urban centers, particularly New York City. It is perhaps no surprise, therefore, that the tax system developed in New York served as the blueprint for other states. In effect, states with a meaningful reliance on nonresident workers for personal income tax revenues—predominantly but not exclusively New York—were able to set the terms and conditions of multistate income taxation.

As noted above, the standard postwar approach for designing state personal income taxes features inclusion in the tax base of both the worldwide income of residents and the source income of non-residents. In addition, residents are typically allowed a credit for taxes paid to other states. This approach effectively guarantees the primacy of source-state taxing rights. If the source state imposes an income tax, the nonresident must pay it and look to her state of residence for any relief from double taxation. In effect, this creates a dilemma for the worker's state of residence: it must either forgo its right to tax the out-of-state income of its own residents (by granting them a credit for taxes paid to other states) or subject them to double taxation of income earned and taxed elsewhere. States generally opt for the first of these approaches, but they also (understandably) limit the credit to the lesser of the tax actually paid or the amount of tax that would be paid as determined by home state tax rates. As a result, the cross-border taxpayer's tax rate is always the higher of her home state rate or her work state rate.

3. State Personal Income Taxes in the 21st Century

In each of the 41 states with personal income taxes (as well as D.C.), the basic structure and operation of the tax follows a similar general approach. The starting point for a taxpayer filing a state income tax return is her income determined under federal law. That is, all income tax states "piggyback" to some significant

[75] Salario v. Glaser, 414 A.2d 943, 950 fn 11 (1961).

degree on the statute and regulations of federal income tax law.[76] As noted above, states require taxpayers to report and pay tax on their worldwide income (typically without regard to the source of that income) while requiring nonresident taxpayers to report and pay tax on income sourced to that state. This approach creates the risk of double taxation that tax credits of the sort described above are meant to mitigate.

Of course, there are exceptions to the dominance of the New York Model. For the most part, however, these exceptions are generally limited to bilateral tax agreements—reciprocity agreements—between states. Under reciprocity agreements, the state of employment typically agrees not to tax the earnings of workers from their resident state. In this case, the cross-border worker pays tax only to her state of residence. Reciprocity agreements generally only apply to income earned from employers, and not other types of income such as self-employment income. Critically, these agreements need to be reached bilaterally between pairs of states. Most of these agreements were reached during the 1960s and 1970s by pairs of states in the Midwest that have metropolitan areas located near state borders.[77] In addition to reciprocity agreements, there are also a small number of states that have retained reciprocal nonresident credits (sometimes called "reverse credits"), similar to the type of credit urged by Seligman in New York and later repealed in response to the controversy with New Jersey.[78]

Finally, the rate structures of state income taxes vary considerably from state to state. Most income tax states use a graduated or "progressive" rate structure, with marginal rates rising at higher income levels. Of the 41 states with income taxes, 33 follow this approach.[79] The remaining states have single rate "flat" taxes. Top marginal rates for state income taxes span a wide range across the country. For example, the top rate in North Dakota is 2.9%, while the top rate in California is 13.3%.[80] The breakpoints at which the top rate kicks in also vary widely across the country. In California, for example, the top rate of 13.3% applies at income levels of $1 million and over, whereas North Dakota's top rate of 2.9% takes effect at income levels less than half that amount.[81] It also bears noting that in some states with ostensibly progressive rates have top marginal rates that take effect at relatively low levels of income. For example, the Alabama income tax features three separate rate brackets—2%, 4%, and 5%—but the state's top rate applies to any income more than $3,000 ($6,000 for married filing jointly), a figure so low as to render the statutory rates only nominally progressive and *de facto* proportional.[82]

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[76] Hellerstein & Swain treatise; On the question of piggybacking on federal tax provisions, see Kirk J. Stark, *The Federal Role in State Tax Reform*, 30 Virginia Tax Rev. 407, 423-424. *See also* Ruth Mason, *Delegating Up: State Conformity with the Federal Tax Base*, 62 Duke L. J. 1267 (2013).

[77] See Jonathan C. Rork and Gary A. Wagner, *Is There a Connection Between Reciprocity and Tax Competition?,* 40 PUBLIC FINANCE REVIEW 86 (2012) for a list of state pairs with reciprocity agreements. We note that, in the case of remote work and telework, these reciprocity agreements are likely to be ineffective. In the absence of an interstate reciprocity agreement, reciprocity agreements only apply to a pair of two states. Unlike commuting, remote work is global in nature and there is no reason to believe that a remote worker needs to work from a neighboring state. The global nature of telework thus makes a bilateral agreement between states ineffective at resolving the underlying sourcing issues discussed in subsequent sections.

[78] There are 9 states with such nonresident credits, as compared to 43 states with credits for residents. *See* CCH Publications, 2019 STATE TAX HANDBOOK, 367-72 (2018).

[79] Personal Income Tax Rates – 2022, CCH State Tax Guide (2022) (smartcharts.cch.com/SmartCharts/ChartDirect.aspx).

[80] Id.

[81] Id.

[82] Id.

B. The Current Tax Treatment of Cross-Border Employment Arrangements

1. *The Importance of Nonresidents to State Income Taxes*

Before turning to the legal framework for taxing the income of nonresidents, a brief note is warranted regarding the revenue significance of this population. While all states raise income tax revenue from both residents and nonresidents, there is considerable heterogeneity among the states. Nonresidents might come to owe income taxes for a range of different reasons that explain this heterogeneity. Most obviously there is the category of interstate commuters who, in the absence of a reciprocity agreement, pay taxes on labor income according to the New York model described above. But nonresidents may also earn income from non-commuting sources of income such as consulting contracts, rental property income, business income, or even from professional athletes who work, but do not reside, in the state.[83] This group of non-commuters is likely to consist of many high-income individuals.

But how important are the personal income taxes paid by nonresidents for state government budgets? A recent working paper by Agrawal and Tester digitizes state tax revenue data raised from nonresidents for those states that release these data publicly.[84] We reproduce the relevant data from that analysis in Figure 8 below. The total height of the bars shows the percentage of total personal income tax revenue that is raised from nonresident tax returns. Aggregating these figures for all states that release data, we know that approximately 7.5% of state tax revenue is attributed to nonresidents. For these twenty-one states, this amounts to $20 billion per year in tax revenue, indicating that the "globalized" multi-state nature of taxpayers is a significant source of state tax revenue.

Given differences among the states, it is reasonable to assume that the composition of this revenue due to commuters and non-commuters also varies from state to state. In the absence of direct breakdown, Agrawal and Tester use the United States Census to estimate the share of taxable labor income earned from interstate commuters.[85] This share is then used to approximate, after adjusting for reciprocity agreements, the share of revenue raised from commuters. As Figure 8 shows, there is significant variety across these 21 states in the importance of income tax revenue from nonresident commuters. States with the greatest reliance on nonresident commuters are, not surprisingly, concentrated in the Northeast corridor, including Rhode Island, New York, New Jersey, Connecticut, and Vermont. Certain states located in other parts of the country also rely heavily on income tax contributions from nonresident commuters, most notably Kansas (likely owing to the mix of workers in Kansas City) and Oregon (same issue as to Portland).

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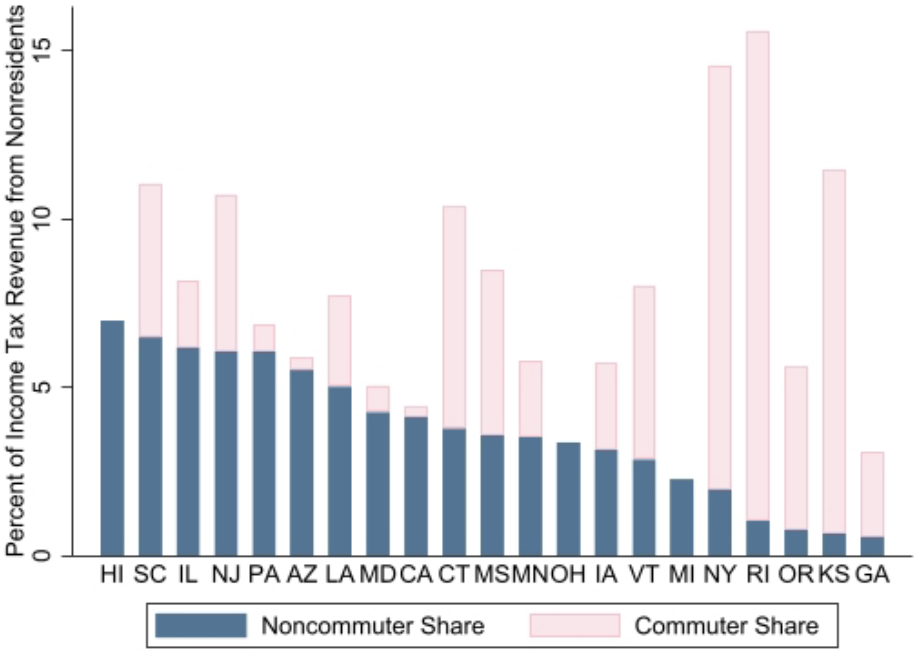
[83] Historically, team-based professional athletes paid taxes based upon the headquarters of the team and their residence. This implied that the players for the Los Angeles Lakers would pay taxes to the state of California and their state of residence (if different), with credits for taxes paid to California. Notably, this changed when the Chicago Bulls defeated the Los Angeles Lakers in the 1991 NBA finals. California lawmakers imposed an income tax on the visiting Chicago Bulls. In retaliation, Illinois passed legislation ("Michael Jordan's Revenge") to tax the earnings of the visiting Lakers. Currently, all states with income taxes and some municipalities apply the source principle to the earnings of visiting team-based professional athletes, apportioning income based on "duty days" in the state. Of course, NASCAR drivers or professional golfers are self-employed and thus have always been legally obliged to pay income taxes to the source state.

[84] See David R. Agrawal and Kenneth Tester, *The Effect of Taxes on Where Superstars Work*, SSRN, Working Paper 3718441 (2021).

[85] Id.

Figure 8: Revenue Raised from Nonresident Taxpayers by State



In contrast to the blue bars, the green bars in Figure 8 show the share of personal income tax revenue that is estimated as being raised from nonresident non-commuters. As can be seen, the state of Hawaii has virtually no interjurisdictional commuting (not surprising, given the state's location) and thus nearly all of its nonresident income tax revenue, which is likely from sources such as rental property located in the state, is from non-commuters. In the aggregate, nonresident noncommuters account for just under 4% of state personal income tax revenue. Scaling this up to account for states that do not release data indicates approximately $13 billion per year is raised from non-resident noncommuters: a revenue source greater than all state alcohol taxes or approximately one-third the amount of state corporate tax revenue.[86]

2. *Sourcing Rules for Cross-Border Remote Work*

Recall that the standard approach for the design of state personal income taxes, derived from the "New York Model" described above, is for the state to (1) tax the worldwide income of residents, (2) tax the in-state source income of nonresidents, and (3) provide a credit to residents for taxes paid to other states on income sourced to those states. While step (1) in this process can typically be completed without regard to sourcing rules, steps (2) and (3) both require more detailed rules specifying the source of income so that nonresidents can determine which income is subject to tax in states where they work and residents can

[86] For an overview of revenue figures from alternative taxes, see Urban Institute, *State and Local Finance Initiative*, "State and Local Revenues" (available at https://www.urban.org/policy-centers/cross-center-initiatives/state-and-local-finance-initiative/state-and-local-backgrounders/state-and-local-revenues).

determine which taxes paid to other states may be claimed as a credit on their home state returns. The principal legal issue raised by remote work is determining the source of income where an employee provides some or all her work from a physical location outside the taxing state.[87] Here we face squarely the questions raised at the outset of this article. Does state taxing power extend to all income derived from in-state firms, including wages paid to those who never set foot in the state? Or is a state permitted to impose income taxes on nonresident employees only to the extent they are physically working within the state? In addressing these questions, it is important to note the distinction between current state practices (as laid out in state tax statutes and associated regulations) and constitutional limitations (how far does state taxing power over nonresidents extend, regardless of current practices).

We begin by noting that, in sourcing the labor income of employees, most states currently follow a physical presence rule that looks to the proportion of time spent working in the state as compared to the total amount of time working. The leading treatise on state taxation gives the examples of Pennsylvania and Oregon, both of which follow a "working days" formula crafted to identify the percentage of total working days the nonresident has spent working in the taxing state.[88] In making this determination, states typically look to the physical location of the employee at the time she is providing the services.[89] To simplify somewhat, if we assume that a California resident works for 9 months in Los Angeles and 3 months in Chicago, she would have 75 percent of her income sourced to California and the remaining 25 percent sourced to Illinois.[90] As an initial matter, she would be taxed by California on her worldwide income, including the income earned in Illinois. Let us assume that this calculation results in a preliminary tax liability of $40,000 on her entire income. Assume further that the taxpayer´s Chicago income results in a $5,000 income tax liability to Illinois. Because California allows its residents to claim a tax credit against personal income tax liability for taxes paid to other states, the taxpayer's ultimate tax liability to California (after taking account of the credit) would be $35,000 – i.e., the $40,000 tax reduced by the $5,000 tax credit. Thus, she is paying $35,000 in income tax to California and $5,000 to Illinois. Note that the tax credit provided by the state of residence (here California) effectively functions as a mechanism to cede the revenue to the source state (here Illinois). In addition, the determination of source is made according to the physical location of the work giving rise to the income. In our example, both Illinois and California are treating 25 percent of the employee's income as arising in Illinois because she spent 3 months of the year working in Chicago. But while this physical presence rule is the standard approach states use for the sourcing of personal service income, the question remains whether states are *constitutionally obligated* to follow a physical presence sourcing rule for labor income.

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[87] It bears noting that this is certainly not the *only* legal issue relating to remote work. Among other things, an employer may find that it has income tax nexus with the state(s) where its remote employees work.

[88] JEROME HELLERSTEIN, WALTER HELLERSTEIN, JOHN SWAIN, STATE TAXATION, ¶ 20.05[4], 20-17 to 20-18 (3d ed. 2014).

[89] *See* Mark Klein, Joseph Endres, Katherine Piazza, *Tax Implications of COVID-19 Telecommuting and Beyond*, THE CPA JOURNAL (July 2021) ("Generally, for personal income tax purposes, most states have the rule that the employee's physical presence dictates where tax is due. For example, an employee working from her Michigan home for her employer in Illinois is required to pay Michigan income taxes, because she is physically present in Michigan doing work.")

[90] States then differ in how to apply marginal tax rates after determining the source of income. Under one approach, for nonresidents, the tax schedule is applied only to income earned in the state. In this case, earnings in other states are irrelevant. Under a second approach, the taxes are based on the fraction of income earned in the state relative to federal income. The latter approach requires applying the tax schedule to the total income of the nonresident and then determining state tax liability by multiplying by the percent of income earned in the state. For an illustration of the second approach, which is the dominant method of applying progressive marginal tax rates to nonresidents, see Wheeler v. Vermont, 249 A.2d 887 (1969). For a discussion, see Walter Hellerstein, *Some Reflections on the State Taxation of a Nonresident's Personal Income*, 72 MICHIGAN L. REV. 1309 (1974).

The most significant litigated case on this question is *Zelinsky v. Tax Appeals Tribunal of the State of New York*, decided by the Court of Appeals of New York (New York's highest court) in 2003.[91] In *Zelinsky*, the taxpayer was a (tax!) law professor who was a resident of Connecticut but employed by the Cardozo School of Law in New York City. For the years at issue, Zelinsky spent a certain number of days of the week working exclusively from his home office in Connecticut, not entering New York all. On these days he would work on his scholarship, grade papers, or undertake other responsibilities that did not require his physical presence in New York. The question this raised was whether New York still had the authority to tax that portion of Zelinsky's income attributable to his work from home. Zelinsky took the position that the income attributable to those Connecticut days constituted Connecticut-source income and thus could not be taxed by the state of New York. In contrast, New York took the position that all of Zelinsky's income was New York source income. In other words, New York was claiming the authority to impose its income tax on a nonresident working in a state other than New York.

The legal basis for the New York position is the state's so-called "convenience of the employer" rule for sourcing income of nonresidents. As is true in most states, a nonresident employee who works both in and outside of New York must apportion his income according to the number of days spent in New York and the number of days spent outside of New York in accordance with the standard "working days" calculation described above.[92] The "convenience of the employer" rule is a provision that specifies the circumstances under which such an employee is permitted to count a working day as a non-New York day. The rule states that "any allowance claimed for days worked outside New York State must be based upon the performance of services which of necessity, as distinguished from convenience, obligate the employee to out-of-state duties in the service of his employer."[93] In other words, for a day to be counted as a non-New York day, the employee must be able to demonstrate that it was her employer's business needs that obligated her to work outside the state. Put differently, she must be able to show that the work was undertaken outside New York for bona fide business reasons of the employer, rather than for her own convenience. Given the focus of this rule, it is somewhat odd that the provision is known as a "convenience *of the employer*" test. The Court of Appeals (correctly in our view) noted that the test "would therefore more aptly be called the 'necessity of the employer' test" rather than the convenience of the employer.[94]

In any event, in the absence of a bona fide business reason for the employer requiring the employee to work outside New York, the rule treats the day as a New York day, even if the employee never sets foot in New York on that day. In Zelinsky's case, the court determined that his staying home to work in Connecticut was something that he did for his own personal convenience, rather than in the service of his employer's requirements. An important aspect of the court's reasoning underlying this conclusion seems to have been a comparison between nonresidents such as Zelinsky and similarly situated residents of New York. Noting the common practice of busy professionals to take work home at the end of the day or to sometimes even work from home, the court concluded that it would be unfair to New York residents if their nonresident counterparts were able to avoid New York income taxation of their earnings simply because their homes

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[91] In the Matter of Edward A. Zelinsky et al., Appellants, v. Tax Appeals Tribunal of the State of New York et al., Respondents, 801 N.E.2d 840 (2003).

[92] See N.Y. Comp. Codes R. & Regs. Tit. 20 § 132.18(a) - *Earnings of Nonresident Employees and Officers* ("If a nonresident employee . . . performs services for his employer both within and without New York State, his income derived from New York State sources includes that proportion of his total compensation for services rendered as an employee which the total number of working days employed within New York State bears to the total number of working days employed both within and without New York State."

[93] N.Y. Comp. Codes R. & Regs. Tit. 20 § 132.18(a) - *Earnings of Nonresident Employees and Officers*.

[94] In the Matter of Edward A. Zelinsky, *supra* note 92, at 844 (fn. 2).

were located on the opposite side of the state border. After all, the court seemed to suggest, both employees are essentially doing the same thing – i.e., doing some work from the convenience of their homes – so why shouldn't they be treated the same under New York law? Thus, as a matter of New York law, the Court of Appeals of New York determined that any income attributable to Zelinsky's work undertaken in Connecticut was New York source income.

In addition to this determination regarding the operation of New York law, the court rejected Zelinsky's constitutional objections to the operation of New York's convenience of the employer rule. These objections were chiefly focused on the U.S. Supreme Court's "dormant commerce clause" jurisprudence as applied to state tax statutes. As the court noted in *Zelinsky*, that doctrine is rooted in a 4-prong test from the U.S. Supreme Court decision in *Complete Auto Transit, Inc. v. Brady*, which focuses on (1) substantial nexus, (2) fair apportionment, (3) discrimination against interstate commerce, and (4) a fair relationship to services provided by the state.[95] It was the "fair apportionment" prong that was at issue in the *Zelinsky* case, specifically whether New York's approach satisfied the so-called "external consistency" test which, as Justice Souter wrote on behalf of the U.S. Supreme Court more than a quarter century ago, seeks "to discover whether a State's tax reaches beyond that portion of value that is fairly attributable to economic activity within the taxing state."[96] In a nutshell, then, the question posed was this: in taxing Ed Zelinsky on his entire Cardozo salary, rather than just a portion determined by the percentage of working days he spent in New York, was New York reaching "beyond that portion of value that is fairly attributable to economic activity within" New York? The court answered no, concluding that "the taxpayer has failed to demonstrate by clear and cogent evidence that the income attributed to New York was in fact out of all appropriate proportion to the business transacted here or has led to a grossly distorted result."[97] The court also rejected Zelinsky's claim that New York's "convenience of the employer" rule violates the Due Process Clause, noting that "an ample foundation to justify the tax is provided by the host of tangible and intangible benefits flowing directly and indirectly to petitioner from New York, the location of the law school that supplies his total relevant income."[98]

The *Zelinsky* case and New York's convenience of the employer test have some important lessons for understanding the state income taxation of remote teleworking arrangements. Professor Zelinsky may not have been a full-blow "digital nomad" but he was essentially a pre-pandemic cross-border remote worker, undertaking the responsibilities of his employment, or at least a portion of them, from an out-of-state location. The days he spent working from his home in New Haven were certainly "working days" – but were they properly attributable to Connecticut or New York? At the extreme, we might imagine certain employees who not only spend a portion of their time away from their usual office, but who never actually set foot in the taxing state. Such an arrangement would have been unusual during the years at issue in the *Zelinsky* case, but today in the wake of the COVID pandemic it is becoming much more common and accepted. Unlike in 1994, technology now enables certain employees in certain industries to undertake their work entirely remotely, connecting to other workers only via phone/internet, using Zoom, or other remote working technologies. This naturally raises the question of whether a worker with even more attenuated physical connections to the taxing state—e.g., someone in a distant location completing her work exclusively online—would face the same tax fate as Ed Zelinsky.

The application of New York-style "convenience of the employer" sourcing to pandemic-era remote work arrangements was on full display in the recent *New Hampshire v. Massachusetts* litigation, which the

[95] Id. at 845 (quoting Compete Auto Transit v. Brady, 430 U.S. 274, 279 (1977)).
[96] Id. (quoting Oklahoma Tax Commissioner v. Jefferson Lines, Inc. 514 U.S. 175, 185 (1995)).
[97] Id. at 849.
[98] Id.

Attorney General of New Hampshire filed (asserting original jurisdiction) with the U.S. Supreme Court.[99] In this litigation, New Hampshire challenged the application of a tax rule promulgated by Massachusetts as applied to New Hampshire residents. Significantly, New Hampshire itself is one of the few states in the country without a broad-based personal income tax – a feature the state consistently highlighted in litigation documents as the "New Hampshire Advantage."[100] Even so, when its residents work in other states, ordinarily they must pay income tax as nonresidents to the states where they undertake that work, including Massachusetts. None of this was particularly controversial until the onset of the COVID-19 pandemic, when the Massachusetts Department of Revenue issued an emergency temporary regulation indicating that the income of nonresidents working remotely would continue to be treated as Massachusetts source income, even though they were conducting their work entirely outside of Massachusetts.[101] Lawyers for New Hampshire described this regulation as "a direct attack on the New Hampshire Advantage."[102] The chief factual scenario highlighted in court filings was that of a New Hampshire resident who was obligated by virtue of the Massachusetts COVID-19 stay-at-home order to only work from home (in New Hampshire) and therefore prohibited from entering Massachusetts. Massachusetts took the position not only that these employees could not physically commute into the state but that they nevertheless were obligated to pay tax on the income that they derived from their Massachusetts employers. This action was an egregious violation of state sovereignty and wholly unconstitutional, according to New Hampshire, and could not possibly withstand judicial scrutiny. The Supreme Court refused to hear the case, leaving the issue to be resolved either in future state court litigation or perhaps through federal legislation.

3. *Physical Presence as a Constitutional Requirement?*

Based on the foregoing, what can be said about the current state of the law regarding the sourcing of wage and salary income earned by a nonresident employee who is physically working in one state but for an employer that is in another state? For the sake of clarity, let us assume that (1) the state where the employee is physically located and performing her services as an employee is the employee's state of residence, and (2) there is only one state where the employer is unambiguously located and it is in that state where the firm is doing business and making use of the employee's services. To sharpen the issue further still, it will also be useful to assume that (unlike in the *Zelinsky* litigation) the employee has no physical connection with the latter state other than being employed by a firm doing business in that state. Ed Zelinsky himself has offered a useful hypothetical for considering these questions, not in his own case in New York but rather in his *amicus* brief filed in the *New Hampshire v. Massachusetts* litigation.[103] There Zelinsky posited a hypothetical involving a customer service representative working from her home in Montana for a California call center.[104] Could California require this employee to pay California income tax on the wages that she earns working from her home in Montana, even if she never once sets foot in California?

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[99] Motion for Leave to File Bill of Complaint, State of New Hampshire v. Commonwealth of Massachusetts (October 19, 2020).

[100] New Hampshire does require its residents to pay an income tax that applies only to interest and dividends.

[101] Mass. Dep't of Revenue, Technical Information Release 20-5, Massachusetts Tax Implications of an Employee Working Remotely due to the COVID-19 Pandemic (Apr. 21, 2020), https://bit.ly/3n2BrCp.

[102] Motion for Leave to File Bill of Complaint, State of New Hampshire v. Commonwealth of Massachusetts (October 19, 2020) at page 3.

[103] Brief of Professor Edward A. Zelinsky as *Amicus Curiae in Support of Plaintiff's Motion for Leave to File Bill of Complaint*, New Hampshire v. Massachusetts, Page 2 (December 10, 2020).

[104] Id. at 2.

In his *amicus* brief, Zelinsky himself offered a simple and straightforward answer to this question. *No*, writes Zelinsky, "only Montana can constitutionally tax her salary. California cannot double tax that income earned in Montana."[105] In our view, the matter is substantially more complicated than Zelinsky's conclusion lets on. Two points in particular deserve emphasis. First, as far as we have been able to determine, there are currently no states that have completely abandoned a physical presence standard for sourcing the wage income of employees. Indeed, even in states that have adopted the "convenience of the employer" approach, such as New York, the employee must have at some point a physical connection with the state in order for the rule to apply. One of the most aggressive applications of the New York rule was in the case of *In the Matter of Kenneth Phillips*, a 1999 decision regarding a municipal bond salesperson working for Lehman Brothers.[106] Because of the particular demands of his job, including the need to analyze and monitor markets at any time of day or night, Lehman had provided Phillips with a home office equipped with computers, fax machines, and 25 phone lines. Even so, New York took the view that because Phillips's work *could have* been done in New York, any time he spent working from home in Pennsylvania must still be counted as days working in New York under the convenience test. Significantly, the court took note of the fact that Phillips did in fact spend a "substantial proportion" of his working days in New York and that his activities there were basically the same as his activities in Pennsylvania. In addition, like Zelinsky, Phillips had an established place of employment in New York (an office in a building, etc…). Given that Phillips could have done his work in his usual New York location, the court determined that the days spent he spent working in Pennsylvania were not truly dictated by the needs of his employer.[107]

In other words, even in New York – the state with arguably the most aggressive rules regarding the sourcing of income of nonresident employees – there typically still must be some physical employment connection to the state that warrants claiming the time spent working from home as sourced to the state where that physical connection has been established. It is not as though New York tax officials are scouring the country looking for people who otherwise have absolutely no physical connection with their state and determining that those persons *could have* done their work in New York and therefore must be taxed in New York. Rather, the typical factual scenario implicating the convenience of the employer regulation involves workers who have some physical employment relationship with the state and those individuals are claiming that, despite that connection, some portion of their income should be sourced to their state of residence. We have not reached a point – *yet*, at least – where any states are asserting the taxing powers in Zelinsky's California call center hypothetical.

Second, even though states are not *yet* taking the approach, there is reason to believe that if and when states do take the position that Zelinsky is highlighting – i.e., California seeking to tax the Montana employee simply because she is employed by a California call center – those "source states" likely have the law on their side. Our purpose here is not to provide a robust legal defense of state taxing power in this hypothetical scenario (or any other scenario, for that matter), though a few brief points deserve mention. First, among all the various trends in the evolving jurisprudence of constitutional limitation on state taxing powers, perhaps the most unmistakable is the declining significance of physical presence as the touchstone for determining the scope of a state's power to tax. Indeed, the most significant U.S. Supreme Court decision on state and local taxes in at least a generation—*South Dakota v. Wayfair*[108]—is a lengthy and detailed

[105] Id.

[106] Phillips v. New York State Department of Taxation & Finance, 700 NYS 2d 566 (December 30, 1999), aff'g 1999 N.Y.T.C. T-98 (DTA #815489) (April 15, 1999).

[107] Note that this was also true of the New Hampshire residents who found themselves subject to the emergency application of the convenience of the employer test in Massachusetts. That is, those workers had established places of employment in Massachusetts that fortified the connection between their income and the taxing state.

[108] South Dakota v. Wayfair, 585 U.S. ___ (2018).

repudiation of the very notion that states are constitutionally obligated to rely on physical presence in determining the scope of their taxing powers. To be sure, *Wayfair* concerned different a type of tax (i.e., the retail sales tax) and a different doctrine (i.e., substantial nexus), but it is hard to read Justice Kennedy's opinion in *Wayfair* and come to the conclusion that the Court is on the verge of breathing new life into physical presence as an important limitation on state taxing authority.

Justice Kennedy's repudiation of the physical presence standard in *Wayfair* was not completely out of the blue. For several decades leading up to the Court's 2018 decision in *Wayfair*, both state legislatures, state courts, and even the U.S. Supreme Court had been gradually abandoning physical presence as the touchstone of state taxing power. That trend has been clearest in the context of state corporate income taxes where states have consistently adopted "economic nexus" statutes for determining whether a corporation is doing business in the state. These statutes typically specify that a firm is doing business in the state if it has a certain quantum of sales, property, *or* payroll in the state. The use of the disjunctive "or" in these statutes indicates that sales alone, without any property or employees in the state, is enough to establish that the firm is "doing business" in the state. After *Wayfair*, states have adopted similar statutes regarding the obligation of out-of-state firms to collect retail sales/use taxes. Given the abandonment of the physical presence standard in these contexts, is there any reason to believe that it has any continuing significance in the personal income tax setting?[109]

III. STATE INCOME TAX PROGRESSIVITY AND URBAN AGGLOMERATION

To this point in the analysis, our focus has been on describing structural trends in remote work arrangements both before the COVID pandemic and after, as well as how income from remote work is likely to be treated under the current framework for taxing nonresident labor income. The question remains of how, if at all, these two phenomena will interact. That is, how is the rise of remote work likely to affect state income taxes. Should we expect the growth in remote working arrangements to have influence the degree to which states can rely on personal income taxes as a vehicle for income redistribution? In other words, as the title of this article asks, will the remote work revolution undermine state tax progressivity? To get a better handle on that question, we provide an assessment of the current state of progressivity in state income taxes, as well as how it has changed over time.

A. Measuring State Income Tax Progressivity Over Time

Over the last thirty years, globalization has lowered the costs of mobility, especially for high-income individuals. Declining costs have increased the mobility rates across countries, especially within the European Union, and these increases in mobility due to globalization have influenced tax policy.[110] At the same time, domestic mobility rates in the United States are at some of the lowest levels in recent decades.[111] But

[109] This question has been attracting new attention in a series of cases recently decided in California. See, e.g., *In the Matter of Blair S. Bindley*, OTA Case No. 18032402 (May 30, 2019) (holding that a nonresident sole proprietor engaged in the business of writing screenplays for California studios entirely from his home in Arizona was subject to California tax on income from the sale of those services).

[110] See, Peter H. Egger, Sergey Nigai, and Nora M. Strecker, *The Taxing Deed of Globalization*, 109 AMERICAN ECONOMIC REVIEW 353 (2019).

[111] See, Patrick Coate and Kyle Mangum, *Fast Locations and Slowing Labor Mobility*, FEDERAL RESERVE BANK OF PHILADELPHIA, WORKING PAPER 19-49 (2019).

such declines in the overall mobility rates do not necessarily imply that tax-induced mobility among high income workers is in decline. Has the decline in mobility costs due to globalization influenced the progressivity of the tax system? If not, what does telework pose that is different, which may more substantially threaten progressive redistribution? To address these questions, we need a baseline understanding of how progressive state income tax codes are and how the vertical distribution of tax burdens has changed over time.

We begin with a note on methodology. Following standard definitions, we define a tax system as progressive if the average tax rate—i.e., total income taxes paid as a share of income—increases with income. As noted previously, determining the taxes paid by an individual requires knowing tax brackets and tax rates, but also information on credits, deductions, exemptions, etc. in every state and year. This information is available from the National Bureau of Economic Research (NBER), which maintains a tax simulator (TAXSIM) that calculates tax liabilities for both federal and state income tax laws using information about the individual taxpayer. For state tax codes, NBER TAXSIM contains information about all state tax laws from 1977 to 2021. We use these data to determine the average tax rate at every level of income ranging from no income to a million dollars of income.[112]

This requires entering specific information into TAXSIM that could influence an individual's income tax liability (e.g., marital status, dependents, wages, dividends, charitable contributions, mortgage interest deductions, business income). To make our simulations comparable over incomes and states, we focus on a "representative" taxpayer that ignores some sources of income or deductions, focusing only certain key characteristics most likely to influence state tax liability. Regarding the taxpaying unit, we simulate tax liabilities for each of the following family types: single, married filing jointly, married filing jointly with two dependents, and a single elderly. Our analysis assumes that married households have wage income split equally among the two adults in the household. In case any tax provisions are age specific, except for the elderly, we assume all adults are 50 years old. For the elderly filer, we assume an age of 75. Finally, as eligibility for dependent care credits, the child credit and the EITC depending on the age of the child, we assume one child is less than 13 and another child 18 years old.[113]

To compare tax burdens across the income distribution, we simulate tax liability for taxpayers at $1,000 increments, ranging from $1,000 to $1 million of income. We assume the taxpayer has an income that is 91% wages, 6% dividends, and 3% from taxable interest. The inclusion of dividends and taxable interest allows us to capture variation in how states tax capital income and wage income (particularly relevant in the case of states, such as Tennessee and New Hampshire, that have no taxes on earnings and only tax capital income).[114] To capture the effects of deductions, we assume the taxpayer has deductible items that are $100 plus 2% of income for real estate taxes, $100 plus 2% of income for charitable giving, and $100 plus 6% of income for mortgage interest. These specifications operate to ensure that the dollar value of deductible items increase with household income, an assumption that accords with actual household tax returns. As a result, and consistent with empirical evidence, in our simulations, only higher income households will itemize deductions. The values and ratios for income and deductions are taken from the NBER's guidelines for constructing state taxes for representative taxpayers through time.[115] As noted by the NBER,

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[112] See, Daniel Feenberg and Elisabeth Coutts, *An Introduction to the TAXSIM Model*, 12 J. POL'Y ANALYSIS & MANAGEMENT 189 (1993). NBER TAXSIM can be accessed at https://users.nber.org/~taxsim/taxsim32/.

[113] Children qualify for the EITC if they are typically younger than 19 or if a full-time student, younger than 24. Children under 17 usually qualify for the child credit and children under 13 qualify for the dependent care credit.

[114] We do not include any capital gains, both because most households do not have capital gains and to avoid complex treatment of whether those gains are short-term or long-term capital gains.

[115] Although the NBER releases some statistics across incomes, states, and times, they only do so for a limited range of income values. We simulate the entire tax function from zero income to one million dollars.

"These ratios are not intended to be typical or average, merely not unreasonable."[116] For our purposes, these assumptions are not a major limitation, as we only wish to document the extent of progressivity across states using an identical household at each level of income in each state-year. Moreover, as our interest will be comparing over time and across states, all results should be interpreted as the relative differences for this representative taxpayer. To make tax liabilities comparable over time, we deflate income using the GDP Implicit Price Deflator.[117] We convert all amounts into 2019 dollars, which means that all results should be interpreted as average tax rates for an individual who would have a given level of income in 2019.[118]

Based on these various assumptions, we simulate state tax liability for the fifty states plus the District of Columbia for the four household types noted above (single, married filing jointly, married filing jointly with two dependents, single elderly) and for every income level in $1,000 increments for all levels of income from $1000 to $1,000,000. We repeat this procedure to calculate taxes in every year (and state) from 1977 to 2020. In total, this means we run 8,944,000 simulations of NBER's TAXSIM program, which arguably amounts to the most comprehensive characterization of state tax systems to date. The results of this simulation process are described below.

1. State Income Taxes and How They Change Over Time

To visualize the results of how progressive state income taxes are and how this progressivity over time, we will present graphs of the average tax rate with respect to income for a select group of states. In the text, we will focus on a married household with two children. All other states and household filing statuses are shown in Appendix A. For purposes of showing the temporal variation in progressivity, we will focus on presenting a long-difference of changes over time, by comparing taxes in 1980 and 2019. The year 2019 is selected because is the last year in TAXSIM prior to the pandemic and the year 1980 is the first year we have data on working from home.

The graphs reproduced below show two lines – one blue and one red. The blue line shows average tax rates for 1980, while the red line represents 2019. The vertical axis shows the average tax rate, while the horizontal access shows income levels. Thus, if the blue line (1980) is above the red line (2019), that means that average tax rates were higher for that income level in 1980 as compared to 2019 – i.e., average tax rates have increased over that 39 year period; a red line on top means that average tax rates have declined over those years. The progressivity of the system is illustrated by the slope of the two lines. A steeper upward slope (from left to right) indicates a more progressive tax system, while a downward slope indicates a regressive tax system.

For context, we first provide information on tax progressivity and tax changes at the federal level over this same 39 year period. As shown in Figure 9A below, the average tax rate at the federal level has decreased across all incomes. This graph reflects a well-known fact about the federal tax system over the past several decades. As the Congressional Budget Office recently noted, "[a]verage federal tax rates fell between 1979 and 2018 across the income distribution, with the sharpest decline in the lowest quintile."[119]

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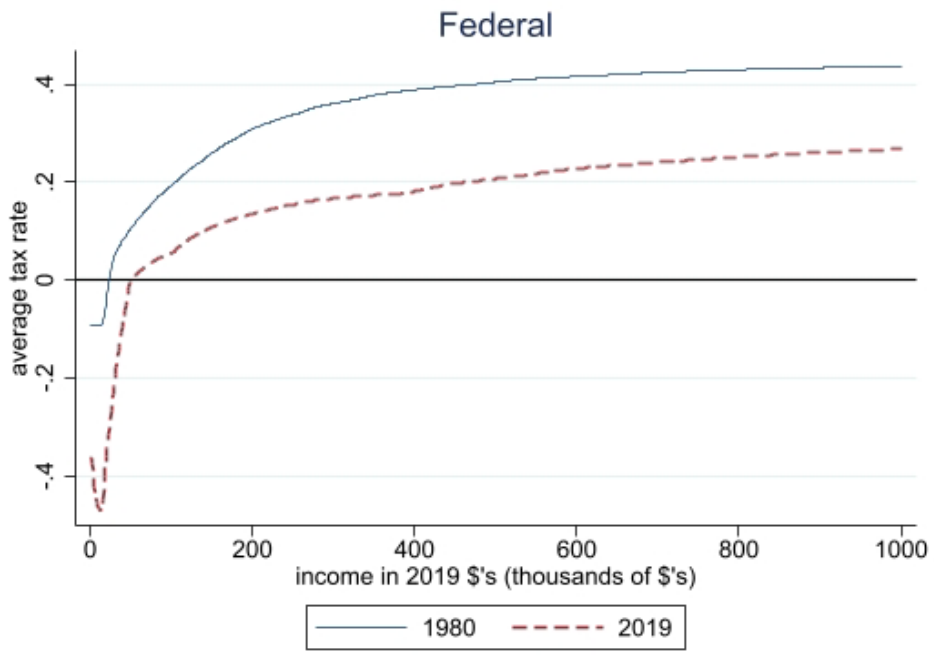
[116] See discussion of TAXSIM on the NBER website, http://users.nber.org/~taxsim/state-tax-rates/

[117] We use the GDP Implicit Price Deflator in United States (USAGDPDEFAISMEI) from the FRED database at the Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/USAGDPDEFAISMEI

[118] For example, an individual who was a millionaire in 2019 would have an income of approximately $400,000 in 1980 that is used in our simulations. These deflated values are used to simulate tax liability, but then are plotted on a common income scale using 2019 income.

[119] Congressional Budget Office, *The Distribution of Household Income, 2018* (August 2021) (available at https://www.cbo.gov/publication/57404) .

Figure 9A: Federal Average Income Tax Rates (1980, 2019)



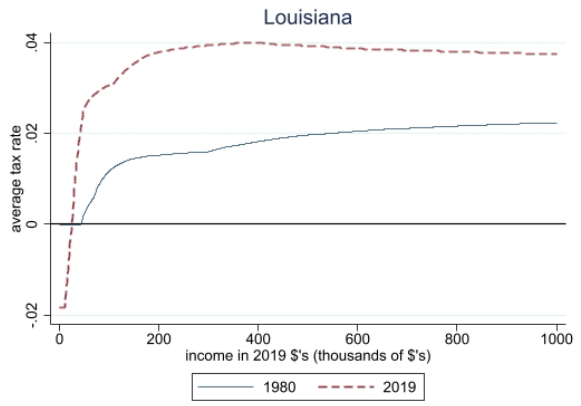
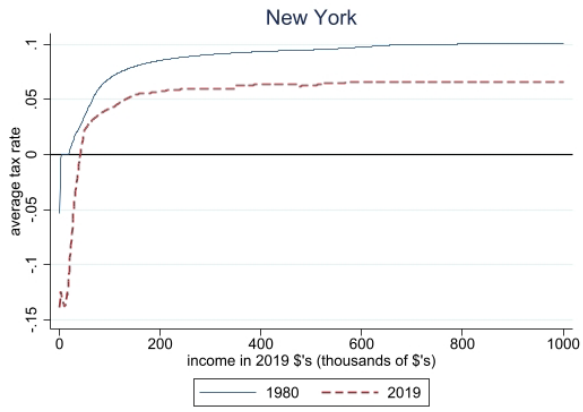
At lower levels of income, the decline in average tax rates is likely due to expansions of the earned income tax credit and other tax credits. At higher income levels, declines in marginal tax rates have driven down tax liability. A large part in the decrease in taxes at the top of the distribution were due to reduction in marginal tax rates in the Tax Reform Act of 1986, tax cuts enacted during the administration of George W. Bush (particularly 2001 and 2003), and the most recent changes from the Tax Cuts and Jobs Act of 2017. Interestingly, the slope of the tax function has become flatter at the "middle class" portion of the distribution, suggesting that tax progressivity increases less rapidly over that range of income. At the highest levels of income, Figure 9A suggests that the federal income tax is nearly a flat tax, with the slope of the two lines increasing only modestly over the range from $500,000 and higher.

Although the federal government has seen across the board decreases in tax rates, many state governments have seen increases in income tax rates due to budgetary pressures to raise revenue. Part of the reason is that over the last several decades, the shift of consumption from goods to services has eroded the state sales tax base. Moreover, due to a Supreme Court ruling,[120] states were prohibited from requiring remote vendors to remit sales taxes unless the vendor had a physical presence in the state. The rise of services combined with pressures from e-commerce meant that starting in 1997, state income taxes surpassed the sales tax as the primary own-source of revenue for state governments. Frequent sales tax rate increases since the 1970s maintained the sales tax share for many years, but the rate increases were not enough to

[120] *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992), which reiterated the physical presence requirement of *National Bellas Hess v. Department of Revenue of Illinois*, 386 U.S. 753 (1967).

offset narrowing of the base.[121] In contrast to the decline of the sales tax, the share of total revenue from state income taxes has nearly doubled over the last fifty years, partially due to its broad base in many states.[122]

Figure 9B shows how revenue pressures can lead to across the board increases in the income tax rate. As the positioning of the two lines reveals (red above blue), Louisiana saw increases in the average tax rate for most taxpayers, except for some credit expansions for low-income households. Interestingly, although the state's income tax is progressive at lower income levels, by 2019, a household with $400,000 of income had a higher average tax rate than a millionaire household. This decline in the average tax rate means the tax is regressive over this range of income.

Figure 9B: A State with an Increasing Average Tax Rate	**Figure 9C: A State with a Decreasing Average Tax Rate**
	

Oher states have followed the federal pattern and lowered tax rates across-the-board. Figure 9C shows the case of New York, which has reduced taxes both at the top and the bottom of the distribution, but with bigger declines for top earners compared to middle income households. At the same time, expansions for low-income credits make New York's system highly progressive over middle- and low-incomes. Some of the decline at the top of the income distribution might be due to concerns about mobility of people and jobs to outside of the New York metro area, but the decline also inevitably reflects political pressures. New York City experienced a severe fiscal crisis in the mid-1970s and nearly declared bankruptcy. In the years following that experience, demands for scaling back government expenditures—what historian Kimberly Phillips-Fein calls "austerity politics"—gained greater prominence in budget debates not only in New York City but also by the state government in [123]

Other than across-the-board increases or decreases, states might lower taxes on one income group and raise taxes on another income group. One popular pattern among (generally) Democratic leaning states is to raise taxes on top incomes and to lower taxes for middle- and low-income households. The recent rise of

[121] See, David R. Agrawal and William F. Fox, *Taxing Goods and Services in a Digital Era*, 74 NATIONAL TAX JOURNAL 257 (2021).
[122] *Id.*
[123] Kimberly Phillips-Fein, FEAR CITY: NEW YORK'S FISCAL CRISIS AND THE RISE OF AUSTERITY POLITICS (2017).

"millionaire" taxes in states such as California and New Jersey are prominent examples.[124] Figure 9D shows a less well-known example: Minnesota. In Minnesota, households with more than $500,000 are now paying more than they were in 1980. At the same time, households earning less than that threshold have seen substantial declines in the average tax rates. Given top earning households contribute a disproportionate share of revenue to state governments, these reforms may even increase revenue depending on the extent of behavioral responses and mobility induced by the tax rate increases on top earners.

Figure 9D: A State with Tax Increases at the Top and Decreases at the Bottom

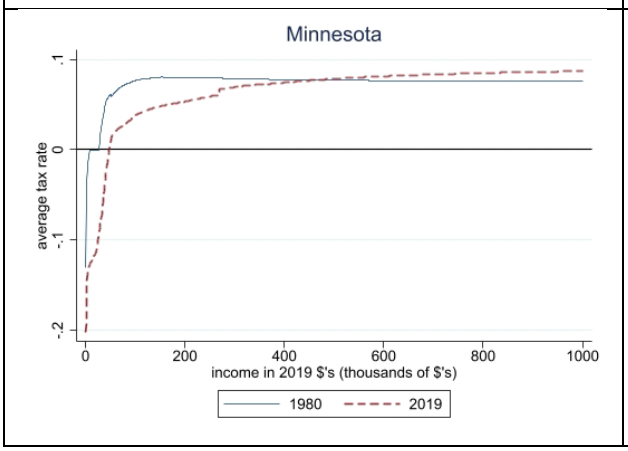
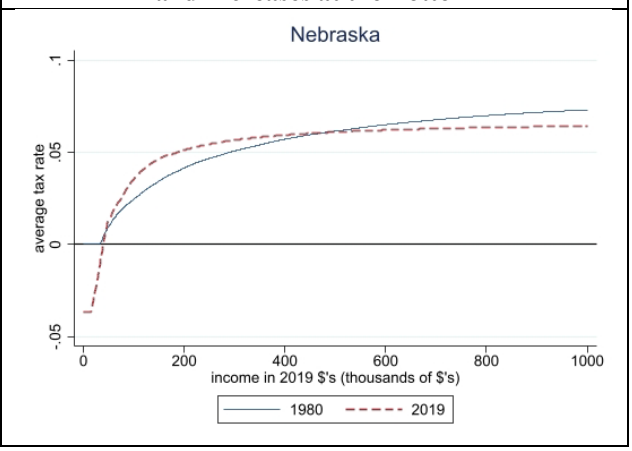


Figure 9E: A State with Tax Decreases at the Top and Increases at the Bottom



At the opposite extreme is Nebraska. Although very low-income households pay less taxes in 2019 than in 1980, middle income households are now paying higher average tax rates. This increase in taxes in the middle of the distribution has been offset with lower taxes on households above $500,000 dollars. As a result, the tax system is much less progressive than it was in 1980. Again, whether the state of Nebraska raises more revenue is an empirical question.

Table A.1 summarizes the results for all states. We identify 15 states with across-the-board increases, 13 states with across-the-board decreases, 9 states that increased taxes but only at the top, and 7 states that increased only at the bottom. As the table reveals, states do not necessarily sort into a classification based on preconceived notions of political changes in the state, suggesting that non-political forces, including economic pressures, play an important role.

2. Assessing Relative Income Tax Progressivity Among the States

While the prior section focused on changes in the level of taxes on a state-by-state basis, in this section we shift our focus to consider the relative progressivity of income taxes among states. One simple way to measure progressivity of the tax code is to analyze how much taxes across different quintiles of the income distribution. To do this, we match 2019 American Community Survey data[125] on the mean income of the

[124] Anna Gorman, *Tax on millionaires boosts California mental health services, study finds*, CNN (March 14, 2018) (available at https://www.cnn.com/2018/03/14/health/california-tax-mental-health-partner/index.html); Janelle Cammenga, *Seventh Time's the Charm: New Jersey Passes Millionaires Tax*, TAX FOUNDATION (September 30, 2020) (available at https://taxfoundation.org/new-jersey-millionaires-tax-fy-2021/).

[125] These data were downloaded from SocialExplorer: https://www.socialexplorer.com/

five quintiles of the income distribution to our tax simulations. The mean household in the bottom quintile earned approximately $15,000 while the mean household in the top quintile earned $238,000. The mean household in the middle quintile earned $66,000. We use federal values, rather than state specific means, so we can easily compare the tax burden of an *identical* household in each state over time. We then visually show, for a married household with two children, the average tax rate faced by the mean individual in each of these quintiles. As telework predominantly benefits high income earners, and because the very top of the income distribution is important for progressivity, we also show the average tax rate of a hypothetical millionaire household. Figure 10 shows the average tax rates for the middle quintile, the top quintile, and for a millionaire household, sorted by average tax rates for the highest income.

Figure 10A: Average Tax Rates in 1980

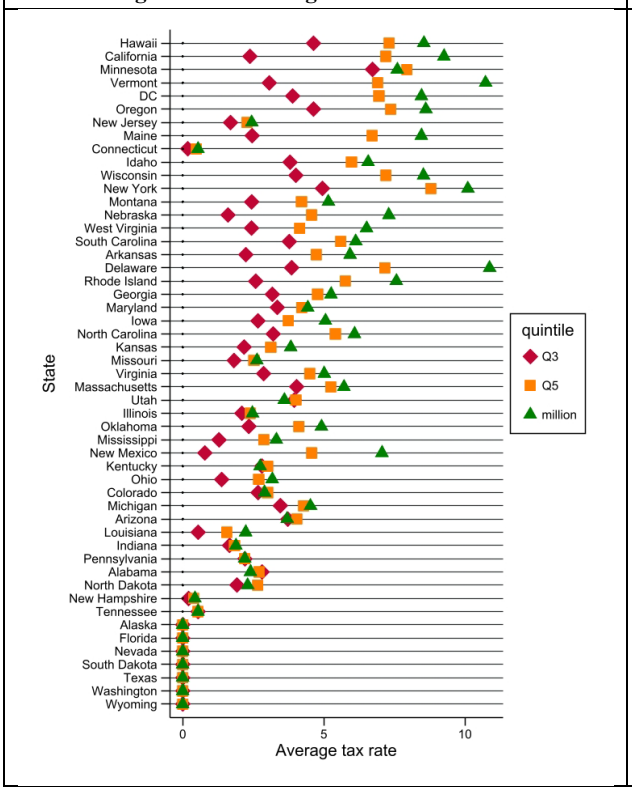
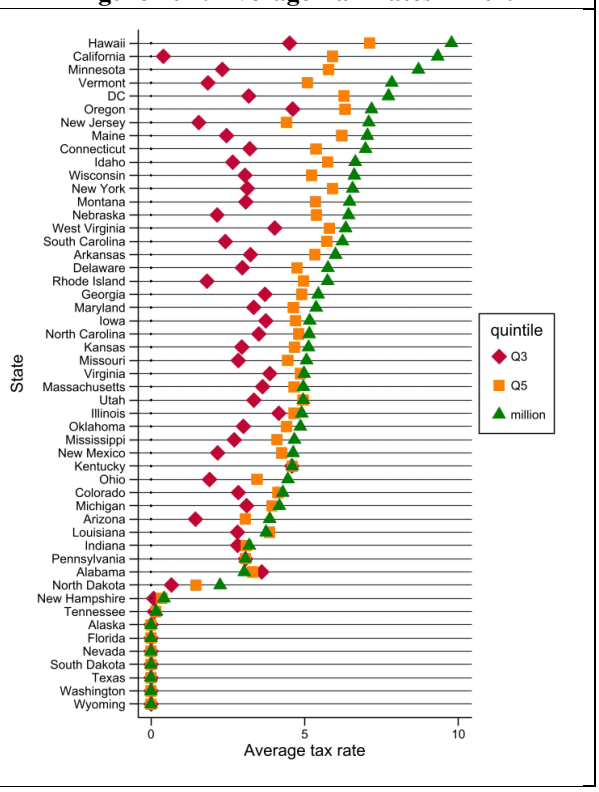


Figure 10B: Average Tax Rates in 2019



In Figures 10A and 10B, we focus on households with incomes of $66,000 (i.e., the average income of taxpayers in the middle quintile), $238,000 (i.e., the average income of taxpayers in the top quintile), and $1,000,000. We focus on these high and middle incomes because as shown previously, remote work opportunities are most plentiful among higher-income households. Moreover, the average tax rates of lower income households are usually a function of state EITC provisions and other credits for low-income households, many of which are common to many states. Therefore, the first-order effect of remote work on progressivity is likely to be on the relative tax burdens of the middle and upper classes. Nonetheless, we realize that researchers may want to study progressivity at various points in the income distribution, and for this reason, Appendix Table A.2 gives the full set of average tax rates across all quintiles so that readers can construct progressivity metrics over their desired income groups.

Figures 10A and 10B reveal several key insights. First, the level of taxes is not always an indication of progressivity across the income distribution. For example, the average tax rate for millionaires is very similar in Hawaii and California, but middle-income households face a much lower income tax burden in California. At another extreme, average tax rates are high in Idaho, but they do not vary as much over the income distribution, because the top tax bracket kicks in at a low-income level.[126] Second, in many states, millionaires face an average tax rate nearly identical to that faced by the average taxpayer in the top quintile. Such an observation indicates that top tax brackets kick in at a low level of income. Some of this may be a result of path dependence, arising from a failure to index breakpoints in the rate structure for inflation. Third, progressivity at the very top is a recent phenomenon in many states, as the states at the highest rates at the top in 2019 are not the same as those in 1980.

Such an ocular analysis of progressivity can be formalized in a difference-based measure that compares the average tax rate at a given point of the income distribution with the average tax rate at other points in the income distribution. For example, we might consider the average tax rate of the top quintile and the middle quintile tells us how much more such an individual pays as a share of his or her income. The larger the number, the more progressive the tax system is over that income range. To get a sense of these differences across states for higher levels of income, we focus on taxpayers earning $1 million relative to the middle quintile.[127] Figure 11 shows the results for all states for 1980 and 2019. The red diamond shows how many percentage points higher a millionaire's average tax rate was compared to a middle class taxpayer for the year 2019, while the blue triangle provides the same information for 1980. For example, note that in 2019, the diamond for California indicates that a millionaire had an average tax rate that was approximately eight percentage points higher than the average household in the middle quintile.

Figure 11: Average Tax Rates for Millionaires Minus Average Tax Rates for Middle Class

[126] Idaho's tax code features five tax brackets with the marginal tax rate in the bottom bracket being 1% and the marginal tax rate in the top bracket being 6.5%. However, for a married household, the top marginal tax rate kicks in at less than $16,000. Given this bracket is so low in the income distribution, even a middle-class household will face a (relatively) high average tax rate that is approximated by the top marginal tax rate.

[127] Again, researchers can construct whatever metric they wish using the data we publish in table A.1.

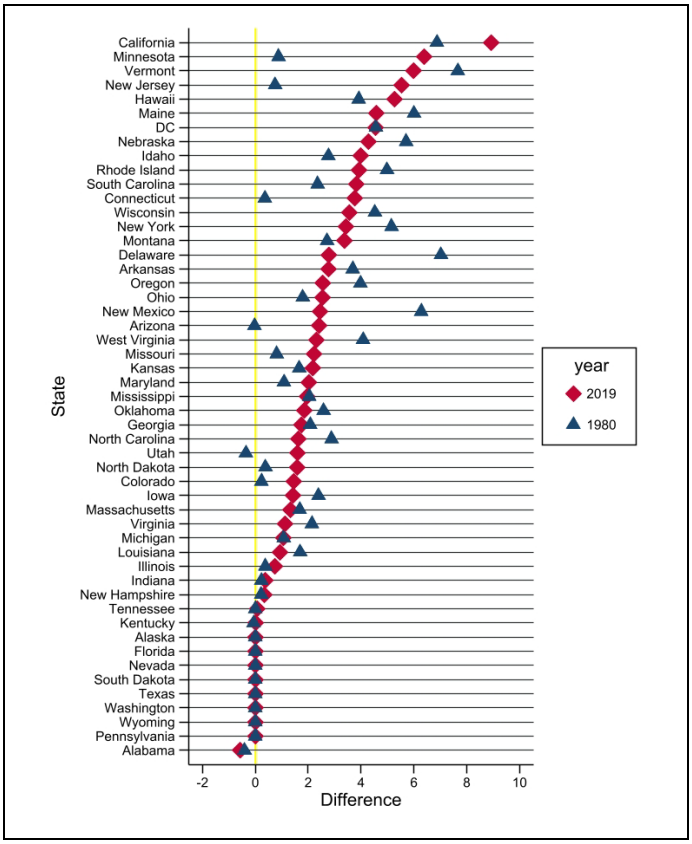


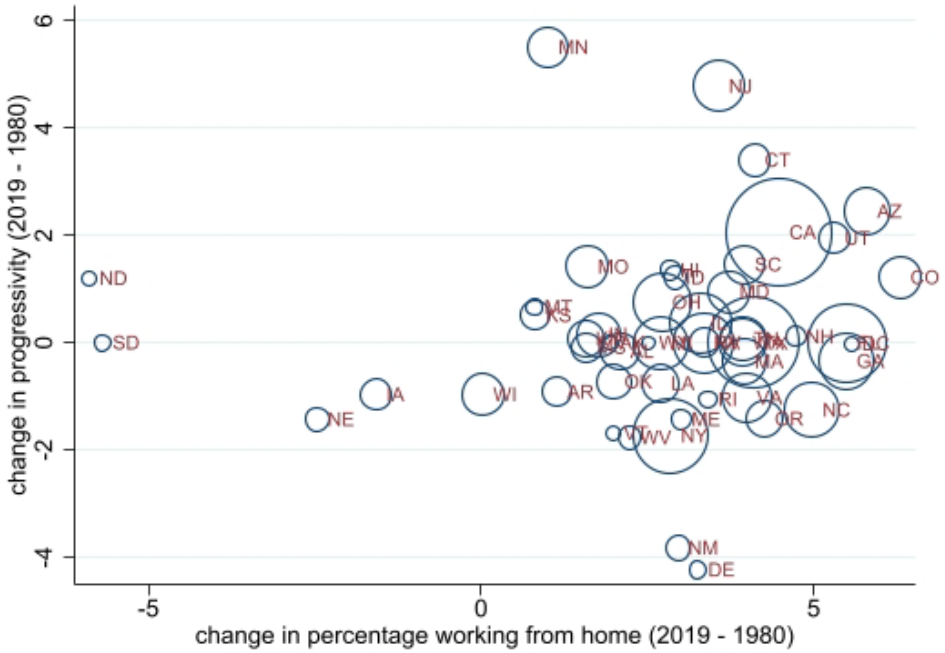
Figure 11 shows that over the period from 1980 to 2019 several states increased taxes at the top relative to the middle class (e.g. California, Minnesota, New Jersey), while other states have seen declines (e.g., Delaware, New Mexico, Vermont). Also noticeable at the bottom of the figure are certain states where there is virtually no difference in average tax rate between middle class taxpayers and those earning $1 million. In Kentucky and Pennsylvania, for example, the difference is approximately zero suggesting the state income tax is essentially flat. The measures of progressivity are obviously sensitive to the income ranges we look at. Even so, we note that at the top half of the distribution, these findings are robust across a range of alternative specifications.

3. New Evidence on Remote Work and Income Tax Progressivity

Unfortunately, there is little empirical evidence of the effect of telework (or more generally, working from home) on state tax progressivity. To provide some initial correlations, we correlate our changes in tax progressivity as measured by the (change in) the difference in top income and middle income average tax rates with the change in working from home as measured in the United States Census. For both series we focus on the change from 1980 to 2019. By focusing on *changes*, rather than levels, we exploit temporal variation in working from home and state tax progressivity. This approach also allows us to account for any state level characteristics that are believed to be fixed over this thirty-year period. These results should not be interpreted as a causal relationship. Any observed variable that correlates both with both changes in progressivity and changes in WFH behavior would make this relationship non-causal. Moreover, such a specification assumes that changes in WFH behavior are exogenous and are not driven by reverse causality.

But if increases in progressivity change the residential or employment locations of individuals, inducing them to shift to increased WFH, then reverse causality may be a problem. Figure 12 shows the correlation where the size of each dot indicates the relative population size of the state.

Figure 12: Correlation Between Changes in WFH and Changes in Progressivity



Overall, Figure 12 suggests that, before the pandemic, there was no significant relationship between the share of the population working from home and the extent of state tax progressivity. In other words, states that saw a large increase in the share of households working from home were just as likely to increase tax progressivity as they were to reduce tax progressivity. If anything, the relationship is slightly positive. Numerous explanations for this finding exist. First, this correlation does not control for other factors such as state budgetary pressures or political changes that have occurred over the last thirty years. Second, data on working from home are from the Census, and as a result, includes family farm work and these data may not be a good proxy for telework. Third, the changes over much of this period (until very recently) were quite gradual. Given path dependence in state tax systems, states may not yet have responded by adjusting their tax systems. Finally, the slight positive relationship might indicate that states that have increased progressivity, are also the states with industries that are concentrated in high-skilled sectors where WFH are likely to have increased over this period.

Although the correlation over the last thirty years may be negligible, this does not imply that it will remain zero in the future. As discussed, COVID-19 has fundamentally, and likely permanently, shocked the fiscal policy equilibrium. The large and permanent changes in telework, coupled with the increased satisfaction with working from home that resulted from it, may pose larger challenges for state governments in the coming years. If so, states may respond more aggressively to the resulting mobility of the tax base than they have done previously. In other words, COVID may provide the shock that breaks the path dependence of state tax systems, allowing these institutions to change.

One notable exception provides hope for the future of decentralized progressive redistribution. Critically, the state of California has seen large increases in tax progressivity despite seeing large increases in working from home behavior. In California, the state's workforce is highly educated, highly skilled, and has a high average income: our initial evidence of who teleworks indicates that these individuals are most likely to benefit from teleworking. Moreover, the state has industries concentrated in sectors that can take advantage of teleworking, for example, the tech sector in Silicon Valley. Despite the state being one of the most vulnerable in terms of ensuing mobility from telework, the state has – at least prior to the pandemic – been able to increase income tax rates on top earners relative to lower-income households.

B. Effects of Taxes on Location Decisions

The data and figures we have provided thus far reveal substantial differences across states in average tax rates, especially at higher levels of income. While some states exhibit relatively high levels of progressivity in their income tax systems, other states have what are essentially flat-rate income taxes with no progressivity. Given that households always have the choice of moving from one state to another, the question naturally arises: do taxpayers make location decisions based on tax differentials across states? Does the option to exit effectively neutralize the ability of state and local governments to raise revenue with progressive income taxes?

A central tenet in public finance, commonly attributed to Musgrave and Stigler, is that jurisdictional choice, when coupled with taxpayer mobility, undermines progressive redistribution, and for this reason, redistributive taxing powers should be assigned to central governments.[128] Stigler examines the "tenable range" of local government redistributive policies, concluding that competition among governments -- resulting from mobility of the tax base -- makes local redistribution less effective, perhaps even unsustainable, and that "redistribution is intrinsically a national policy."[129] But then, one might take this insight a step further, given mobility across international borders, to suggest that supranational governments should be charged with redistributive taxation, as with Thomas Piketty's proposal for a global wealth tax.[130]

What does the evidence show about the extent of taxpayer mobility in response to decentralized taxes? Prior to the rise of remote work, numerous empirical studies analyzed the mobility responses of households to taxation. The empirical evidence on the effect of subnational taxes on mobility is mixed.[131] Furthermore, this literature has faced challenges to identifying causal effects because convincingly estimating the effect of taxes on migration requires a dataset that follows the location of taxpayers overtime and must be able to calculate a measure of counterfactual wages and taxes in jurisdictions that are never chosen. Young, Varner, Lurie, and Prisinzano (2016) and Young and Varner (2011) find very small mobility elasticities, even when focusing on millionaires. These authors find elasticities that are approximately 0.10 or smaller. An elasticity gives the percent change in the stock of high-income earners for a one percent change in the net-of-tax rate. The book, *The Myth of Millionaire Tax Flight,* argues that location is still very important for the elite and

[128] George Stigler, *The Tenable Range of Functions of Local Government*, in FEDERAL EXPENDITURE POLICY FOR ECONOMIC GROWTH AND STABILITY, JOINT ECONOMIC COMMITTEE, SUBCOMMITTEE ON FISCAL POLITICS, Washington DC, 213-219 (1957); Richard A. Musgrave. *The Theory of Public Finance.* New York: McGraw-Hill (1959).

[129] For a summary see, David E. Wildasin, *Open Economy Public Finance*, 74 NATIONAL TAX JOURNAL 467 (2021).

[130] Thomas Piketty. *Capital in the 21st Century.* Harvard University Press (2017).

[131] In this article, we focus on the effect of subnational taxes on mobility. We emphasize empirical studies focusing on the United States and exclude studies concerning international migration. For a survey, see Henrik Kleven, Camille Landais, Mathilde Muñoz, and Stefanie Stantcheva, *Taxation and Migration: Evidence and Policy Implications*, 34 JOURNAL OF ECONOMIC PERSPECTIVES 119 (2020).

that these individuals still select where to live based more so on the amenities available in the region than the taxes paid.[132] Other studies of top income earners have found larger effects. For example, Moretti and Wilson[133] study the top 5% of scientists (inventors) and find that the elasticity of the stock of scientists living in the state is approximately 0.5.[134] Although not zero, these estimates are still rather small: they imply that governments are well to the left of the Laffer Curve – a state government can raise taxes and still raise revenue despite this mobility.[135] At the same time, although the effect of taxes on mobility may not be very large, these distortions are important and even though revenue is increasing in the tax rate, the fear of mobility may constrain the level of taxes that policymakers set. In other words, the presence of mobility may result in parasitic tax competition that limits progressivity. As the mobility of high-income earners is what constrains progressivity, most of the literature has focused on high-income households. One reason this literature has focused on high-income earners is that the mobility responses *caused* by taxes are much smaller or even negligible for lower-income individuals because tax increases fund valuable public services for lower-income households.[136]

Much of the literature on tax-induced mobility focuses on the residential relocation decisions of individuals. However, given the state tax treatment of income follows the New York model and has an employment-based component, this assumes that the location where an individual lives is also where he pays taxes. But this is not likely the case for individuals engaging in cross-border work, including interstate remote work. Individuals living in cross-border metropolitan areas such as New York City, D.C., Boston, Philadelphia, St. Louis, Chicago, Cincinnati, and Minneapolis, among others, can select separately their employment location and their residential location in a way to minimize tax liability. Although commuters do not have the same flexibility of teleworkers and cannot live anywhere in the world, they have choice over at least two states in each cross-border metropolitan area. Thus, for example, conditional on choosing the New York City metropolitan area, an individual can select to work in New York and live in Connecticut, or vice versa. If the states in the metropolitan area do not have a reciprocity agreement, then the effective tax rate is determined by the maximum of the employment or residential state – and which of those is higher determines if the individual needs to move homes or move jobs. In this way, studying mobility in metropolitan areas provides the best possible existing evidence on the potential effect of interstate telework on tax-induced mobility.

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[132] Cristobal Young. *The Myth of Millionaire Tax Flight: How Place Still Matters for the Rich.* Stanford University Press (2017).

[133] Enrico Moretti and Daniel J. Wilson, *The Effect of State Taxes on the Geographical Location of Top Earners: Evidence from Star Scientists*, 107 AMERICAN ECONOMIC REVIEW 1858 (2017).

[134] David R. Agrawal and Dirk Foremny, *Relocation of the Rich: Migration in Response to Top Tax Rate Changes from Spanish Reforms*, 101 REVIEW OF ECONOMICS AND STATISTICS 214 (2019) find a slightly larger elasticity in Spain for personal income taxes and David R. Agrawal, Dirk Foremny, and Clara Martínez-Toledano, *Paraísos Fiscales, Wealth Taxation, and Mobility*, Institut d'Economia de Barcelona, Working paper 2020/15 (2020) find a similar elasticity with respect to wealth taxation.

[135] An older study, Martin Feldstein and Marian Vaillant Wrobel. *Can State Taxes Redistribute Income?*, 68 JOURNAL OF PUBLIC ECONOMICS 369 (1998) finds elasticities that are much larger and that threaten progressive redistribution.

[136] In addition to income taxes, other studies have analyzed the role of state estate taxes on mobility. See Jon M. Bakija and Joel Slemrod, *Do the Rich Flee from High State Taxes? Evidence from Federal Estate Tax Returns*, National Bureau of Economic Research, Working Paper 10645 (2004); Enrico Moretti and Daniel J. Wilson, *Taxing Billionaires: Estate Taxes and the Geographical Location of the Ultra-wealthy,* National Bureau of Economic Research, Working Paper 26387 (2019); Karen Smith Conway and Jonathan C. Rork, *No Country for Old Men (or Women)—Do State Tax Policies Drive Away the Elderly?* 65 NATIONAL TAX JOURNAL *313* (2012); Karen Smith Conway and Jonathan C. Rork, *State "Death" Taxes and Elderly Migration—The Chicken or the Egg?*, 59 NATIONAL TAX JOURNAL 97 (2006).

Exploiting tax differentials within metropolitan areas that straddle state lines, Coomes and Hoyt find that taxes matter for location choices.[137] However, these mobility effects are larger in the select metro areas without reciprocity agreements. Recall that under reciprocity agreements, it is the state of residence that determines the employee's tax liability rather than the source state. Although one might imagine that the effects should be larger in reciprocity states, where the residence state entirely determines the individual's tax liability, these authors show that reciprocity also results in smaller tax differentials. Critically, the decision to cooperate on a reciprocity agreement either results in tax-rate convergence or is correlated with states having similar tax systems a priori. Because in-movers to the MSA face much smaller tax differentials in reciprocity states, these authors argue that dampens mobility effects relative to metropolitan areas following the New York model.

While the prior literature focuses on residential locations by implicitly assuming people live and work in the same state, this is not the case for many high-income earners. High-income earners often accept multiple consulting contracts with varying geographic locations or may travel to work in many locations. Noteworthy examples include professional athletes and entertainers, who earn income in many states. And because of the high-profile nature of these taxpayers, states are aggressive at enforcing the sourcing of this income to the appropriate state. Agrawal and Tester study professional golfers who make weekly decisions over what state to play in.[138] Unlike team sports where taxes on the player's salary are apportioned using the number of duty days in a state,[139] golfers are self-employed individuals and earn income that is sourced to the state where the tournament is held. Because many golfers live in zero-tax states such as Florida, the effective tax rate on prize income is based on the location of each week's event. The authors show that following major state tax increases, golfers are less likely to participate in tournaments in higher tax states. The elasticity of working in a state is approximately 0.4, but is higher for top-ranked golfers.

Agrawal and Hoyt take the analysis one step further by studying the joint employment and residential location decisions of individuals.[140] Critically, these authors show individuals can respond to taxes by adjusting both residential and employment decisions. For individuals working in a cross-border metro area with a reciprocity agreement, a relocation of residence is necessary to reduce tax liability. However, for an individual in most metropolitan areas governed by the New York model, changing one's residence will not reduce tax liability on labor income. For example, an individual living in a low-tax state and commuting into a high-tax state can only reduce tax liability by moving her employment to the low-tax state. Because multistate MSAs break the link between residential and job locations, both the elasticity of jobs and the elasticity of residence matter. These authors also show that how people value the benefits of public services is critical. If public services are highly valued, then individuals may find it advantageous to move to a high-tax state following a tax increase because the (valuable) public services increase when tax rates go up.[141] This justifies the focus on top-income earners. The added public services from a $1 increase in taxes is likely to be valued less than $1 for top earners. But a $1 increase in taxes, especially if taxes are progressive,

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[137] See Paul A. Coomes and William H. Hoyt, *Income Taxes and the Destination of Movers to Multistate MSAs*, 63 JOURNAL OF URBAN ECONOMICS 920 (2008).

[138] See David R. Agrawal and Kenneth Tester, The Effect of Taxes on Where Superstars Work, SSRN, Working Paper 3718441 (2021).

[139] See James Alm, William H. Kaempfer, and Edward Batte Sennoga, *Baseball Salaries and Income Taxes: The "Home Field Advantage" of Income Taxes on Free Agent Salaries,* 13 JOURNAL OF SPORTS ECONOMICS 619 (2012).

[140] See David R. Agrawal and William H. Hoyt, *Commuting and Taxes: Theory, Empirics and Welfare Implications,* 128 THE ECONOMIC JOURNAL 2969 (2018).

[141] For a review of the literature on welfare induced migration, see Jan Brueckner, *Welfare Reform and the Race to the Bottom: Theory and Evidence,* 66 SOUTHERN ECONOMIC JOURNAL 505 (2000).

may be worth more than $1 in services to a low-income household.[142] Thus, higher taxes may repel the rich but attract individuals who value public services.

Agrawal and Hoyt use Census data to study the employment and residential decisions of individuals in cross-border MSAs, estimating this effect over the income distribution. Individuals below the 75th percentile of the income distribution do not respond to (person-specific) tax increases. However, noticeable effects of taxes on location choices begin to emerge above the 75th percentile, with economically meaningful effects starting around the 90th percentile of household income. The empirical evidence suggests that in states following the New York model, households shift employment to low-tax states, while in states with reciprocity, households shift their homes to low-tax states. Given that the observed effects rise with income, this provides cautionary evidence with respect to the role of mobility on progressivity.

Given the separate employment and residential decisions for workers in cross-border MSAs, the two studies on mobility within these MSAs provide the best existing empirical evidence to speculate on the effects telework. Consider an individual located in the Kansas City metropolitan area, which has large urban centers on both the Kansas and Missouri side of the border. An individual who is attached to this metro area, perhaps for family reasons, can work in Kansas or Missouri and can live in either state as well.[143] These two states follow the New York model, so for cross-border workers, the prevailing tax rate on labor income depends on the state with the higher tax rate. As between the two states, Kansas has a slightly higher top marginal tax rate. Suppose, however, that Kansas decides to raise its top marginal rate even more. Those who live and work in Missouri are of course unaffected by this change. Meanwhile, those who live and work in Kansas face the usual linked choice: they will need to move to Missouri *and* switch to a job in Missouri to escape the tax increase. For cross-border workers, avoiding the new higher Kansas tax requires changing only one of the two determinants of tax liability, not both. Those who live in Kansas and work in Missouri must change their residence (but needn't change where they work), while those who live in Missouri and work in Kansas must change their place of work (but needn't move).

In each situation, there will be costs associated with the change – and of course it may not be worth incurring those costs simply to avoid higher taxes. But, in general, it is safe to assume that the overall costs of adjusting only one margin (work *or* home) will be lower than the costs of adjusting both margins (work *and* home). The point here is that cross-border MSAs shed light on those instances where individuals can optimize their choice of where to live and where to work separately. Remote work increases the likelihood that more workers will be able to (1) change their state of employment without moving to a new state, or (2) change their state of residence without changing jobs. An extreme way of making this point would be to say that remote work converts the whole country to a large cross-border MSA.

C. Mobility, City Structure, and Urban Agglomeration

1. Remote Work and Mobility

Although the empirical evidence on telework and household mobility is limited due to its relatively recent surge in popularity, Brueckner, Kahn and Lin[144] provide some initial theory and empirical evidence on the

[142] This is one reason why there exists a literature which show that low-income households are likely to move to states with higher welfare benefits.

[143] By assuming the individual is attached to the metro area, we do not need to worry about the individual moving to another metro area because of a tax increase. Attachment to home is common for many individuals, so such an assumption makes sense for a simplified analysis, but we will relax it subsequently.

[144] Jan Brueckner, Matthew E. Kahn, and Gary C. Lin, *A New Spatial Hedonic Equilibrium in the Emerging Work-from-Home Economy?*, National Bureau of Economic Research, Working paper 28526 (2021).

effect of telework. In their model, telework breaks the connection between the place of residence and place of work, allowing individuals to make location and job choices that were not possible previously. The authors focus on how residential location choices may change in response to telework, particularly when workers in expensive high-productivity cities can move to lower-productivity areas with a lower cost of living. Anecdotal evidence in the media concerning the flight out of Silicon Valley during the pandemic supports this theory.[145] At the same time, telework also allows individuals in low-amenity cities to move to high amenities cities without changing jobs.

The authors emphasize two cases: cities differ only in productivity (e.g., Silicon Valley has high firm productivity) and cities differ only in consumer amenity (e.g., Miami has excellent weather and beaches). When cities differ only in productivity, telework induces movement to low-productivity places, without changing high-productivity jobs. Relocation of residences results in capitalization into house prices: as productive cities are less attractive, house prices fall, but as less productive cities become more attractive places to live, house prices rise. This is in contrast to the second case the authors consider, where cities differ only in amenities. In that case, telework allows individuals to move to high amenities cities without changing jobs. The effect on house prices is the exact opposite of the prior scenario.

When individuals can work anywhere, wages must equalize. Moreover, as some individuals switch to telework, those individuals who do not are left in a less congested city. Thus, telework lowers commuting costs for these individuals, which encourages urban sprawl.[146] The authors then exploit information on housing prices across cities during the pandemic to test the theory. They also use variation from Dingel and Neiman on job shares in industries that allow for WFH.[147] Because cities differ in their industry composition and some industries are more amenable to telework, they exploit this variation to compare cities with a higher or lower ability to shift to telework. The authors find that the change in house prices and rent during the pandemic are lower in high productivity places that have a high telework potential. The authors find no evidence that house prices and rents fall in low-amenity cities with high telework potential. The authors conclude that the dominant effect of telework is to allow workers in high-productivity areas to move to cheaper low-productivity areas; at the same time, they find little evidence that individuals keep the same employment location and use telework to move to a higher amenity area.

What are the implications of the foregoing for tax progressivity? Even prior to the advent of telework, taxes were an important factor for the location choices of high-income households, at least at the margin. At the same time, the mobility elasticities were sufficiently small enough that the distortions from migration are no larger than the distortions from taxes affecting other individual behaviors. Although the elasticities are relatively small, an important caveat is that mobility does not affect all portions of the income distribution equally. By affecting the top of the distribution – where most of the tax revenue is raised – mobility of even a small number of households can have important effects on services for lower-income households. At the same time, these effects are not large enough to eliminate decentralized progressivity entirely. Indeed, the fact that many state tax systems have a progressive aspect to them provides us with *prima facie* evidence that decentralized redistributive policy is possible in the presence of mobility.

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[145] See, for example, Katherine Bindley, *Work-from-anywhere Perks Give Silicon Valley a New Edge in Talent War,* WALL STREET JOURNAL (July 27,2021).

[146] This is consistent with William Larson and Weihua Zhao, *Telework: Urban Form, Energy Consumption, and Greenhouse Gas Implications*, 55 ECONOMIC INQUIRY 714 (2017).

[147] Jonathan I. Dingel and Brent Neiman, *How Many Jobs Can Be Done at Home?*, 189 JOURNAL OF PUBLIC ECONOMICS 104235 (2020).

Even though decentralized redistribution appears to have been possible historically, it does not follow from this observation that taxes are efficiently set. The mobility of high-income taxpayers can induce parasitic tax competition.[148] Because attracting a billionaire to a state may increase tax revenues in the state by millions of dollars, states have incentives to set taxes that are too low. In other words, even if California raised its tax rate on millionaires, the increase in the top marginal tax rate may be less than what it would have been in the absence of mobility. The question going forward is: will telework increase these mobility responses? If so, then, progressive taxation may be more constrained than in the prior era for which we have empirical evidence. The evidence from Brueckner, Kahn and Lin suggests that high-productivity cities will lose some of their advantage as teleworkers leave for cheaper areas, placing new pressures on income tax revenues. As high-productivity cities are often large centers of agglomeration in coastal states, the evidence that telework causes residential flight out of these cities – and no movement into high amenity cities – suggests new constraints on progressive redistribution.

2. Congestion Pricing for Public Services

In addition to mobility and wage effects on the level and distribution of taxes, public service provision may also influence state taxes. Policymakers may desire to implicitly link taxes paid to the benefits received. One reason this is particularly important is due to congestion costs. Suppose that a government provides public services at some total cost, $C(n, z)$, that depends on the amount of public services z and the number of beneficiaries of the public services, n . Then, because costs depend on the number of beneficiaries, congestion costs may arise, whereby more beneficiaries raise the cost of providing services. In other words, providing unemployment insurance to more residents raises the total cost of the services.

Efficient local taxation requires taxes that internalize congestion costs, at the margin, with any additional revenue requirements met via taxes on (or subsidies to) immobile resources.[149] Given migration may result from differences in state income taxes, the marginal cost of providing public services may change as more individuals move into a jurisdiction. This creates congestion costs of the public services, and if not addressed, these effects imply that the locational equilibrium will be inefficient. In other words, when migration produces real externalities, in the form of congestion of public facilities, corrective taxes are necessary to internalize the externality. This is a standard justification for corrective taxation in the presence of externalities.

A key point of this discussion is that redistribution means taxing Peter to pay Paul.[150] If we want California to make a public expenditure of $1000 on behalf of every Paul, like a per-head subsidy (for example, a floor level of income under a negative income tax), we need to collect revenue equal to $n * 1000$, where n is the number of "Pauls". If California doesn't spend any money on Peters -- let's suppose the incomes of Peters are too high to qualify -- so that this basic allowance is the totality of public spending. This is a congestible public good: in the notation of costs discussed above, the cost function $C(n, z)$ takes the special form $C(n, z) = C(n, 1000) = n * 1000$. The marginal cost of serving one more Paul at the same level as the others is just $1000. This is the "marginal congestion cost" of the public service.

Then, to internalize the congestion costs from mobility, the ideal tax would be equal to the marginal congestion cost, or in this case, a head tax or a tax equivalent to that in the amount of $1000, to be paid by

[148] David R. Agrawal, William H. Hoyt and John D. Wilson, *Local Policy Choice: Theory and Empirics*, __ JOURNAL OF ECONOMIC LITERATURE __ (2021).

[149] David E. Wildasin, *Locational Efficiency in a Federal System*, 10 REGIONAL SCIENCE AND URBAN ECONOMICS 453 (1980); David E. Wildasin, URBAN PUBLIC FINANCE (2013).

[150] We thank David Wildasin, who provided (in a series of emails to us) the basic framework underlying the analysis in this paragraph and the subsequent paragraph.

all the Pauls on whose behalf the costs are incurred. This means, of course, that what we give Paul with one hand we take right back with the other hand, so that there is no redistributive transfer. In this way, to obtain a locationally efficient equilibrium, redistributive policy is ineffective. This is important in practice because much spending by the modern welfare state is like this example. For instance, most (of course not all) of the benefits of health care accrue to the people who receive the health care. The same is true for social security, for school children, etc., in addition to direct cash transfers to the poor. A key point is that from a purely efficiency perspective, redistributive taxation will not be efficient because the taxes cannot equalize congestion costs because the taxes are paid by non-beneficiaries, higher-income individuals. Of course, efficiency concerns are not the reason for redistributive policies, which stem from equity concerns or concerns about the distribution of income. But as we will see, the example of congestion costs provides a useful benchmark for why we might believe residents and nonresidents should be treated differently.

What are the implications of remote work? If an individual does not ever set foot in a locality, then one might believe that they do not impose much congestion cost on the public services. The same is true to a first approximation for many sojourners, like commuters. This might be why, to a first approximation, many other federations around the world link income taxes to the place of residence. If, as is reasonable, individuals primarily consume public services in their place of residence and not necessarily the place of work, then a residential income tax better links the costs of providing services to the individuals benefiting from those services.

But sometimes nonresidents impose significant costs: If someone travels to Florida for a week at the beach, sojourners (like Spring Breakers at Ft. Lauderdale for a vivid example, but also hunters that go to the North Woods in deer season, and many other similar examples) do impose some costs, and in fact those costs might be a big fraction of local expenditures in some cases. Then, although the ideal congestion toll would be something like a "head tax," we might have access to imperfect instruments such as meal or hotel taxes to address this congestion. The hotel/meal taxes are not perfect head taxes, of course, but they are location-contingent: if a tourist does not spend a night or eat a meal, they do not pay the tax.

Thinking about remote workers, the question is a bit different: what public services are they benefiting from? Are they benefiting from public services that make the business they work for more productive, but not from any services that they consume directly? In other words, do the roads, court system, and other public services that make the business productive also make the worker better off? These are tough questions to answer, but relative to an individual living in the jurisdiction and even relative to a commuter driving into the jurisdiction to work from an office, the congestion cost of a remote worker on public services seems much lower. In this way, efficiency provides an example whereby society may want to discriminate the taxes paid differentially across remote and physical workers. And even if remote workers benefit from services via the business they work for, those congestion costs are better resolved via payroll taxes or other taxes based on the size of the business, rather than personal income taxes.

3. The Effects of Urban Agglomeration on Wages and Tax Progressivity

In many economic models designed to understand the effect of policies in a multijurisdictional setting, it is assumed that people can move freely across localities and states. Given this assumption, in spatial equilibrium,[151] people must be indifferent among all locations in the federation. As a result, high wages in one area must reflect something "bad" about the region: it must have high housing prices, or it must have lower

[151] Sherwin Rosen, *Wages-based Indexes of Urban Quality of Life*, CURRENT ISSUES IN URBAN ECONOMICS, edited by Peter Mieszkowski and Mahlon Straszheim. (1979); Jennifer Roback, *Wages, Rents, and the Quality of Life*, 90 JOURNAL OF POLITICAL ECONOMY 1257 (1982): 1257-1278.

amenities. Otherwise, if this were not true, people would flow into that high-wage area without limit. This mobility channel, which implies high wages are compensation for a "bad" feature of a state, is offset by reasons why firms may be willing to pay high wages. On the firm side, high wages reflect something attractive that makes the firm willing to locate in an area with high wages. In other words, a firm would not locate in an area with high costs to the firm unless it received productive amenities offsetting those high wages.[152] We discuss each of these issues in turn.

a. Wages and the cost of living/commuting.

In the standard spatial equilibrium model that is a workhorse of urban economics, people choose a state or city to live in and each location delivers a bundle of wages, amenities, and prices to the household. In a simple linear model with identical people, wages plus the value of amenities minus house prices must be constant across the U.S. – otherwise individuals would all move to the place that has the highest valuation. The implication is clear. Holding amenities constant, it must be the case that wages are higher if house prices are higher. Holding house prices constant, if amenities are lower, then wages must be higher. This is a theory of compensating differentials. This logic can also be extended to include transportation costs. In this way, one reason why wages may be higher in Los Angeles than Bakersfield is because house prices are higher in Los Angeles. Albouy shows how wages, house prices and quality of life correlate.[153]

Given that wages can act as a compensating differential, should we expect wages to be different for a teleworker than for an in-person worker? Consider the case of commuting costs. To see the intuition, assume that working in the office entails some fixed cost of commuting, but telework does not.[154] If wages were equal and there was no personal preference for one type of work over the other, all individuals would choose at-home work because it allows an individual to avoid commuting costs.[155] However, we know that this is not an equilibrium. To reconcile this, it is likely that demand for home-based work is lower, which places downward pressure on wages from individuals working from home. Demand might be lower for several reasons. First, some jobs may require fixed capital or interactions with customers. Second, the marginal product of working from home may be lower due to a lack of agglomeration economies or a lack of monitoring from supervisors. Edwards and Field-Henry provide some evidence of this, by showing that WFH is more common for people with high fixed costs – living in more remote areas or having small children at home. In this way, working from home may also facilitate household activities, which may raise differential issues by gender.[156] But, time saved in the form of commuting costs can generate productivity gains for employers as employees can work longer hours.

The fact that high wages act as compensation for high house prices or high transportation costs across metropolitan areas implies that firms may pay teleworkers differentially than in-person workers. While this

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[152] This discussion draws on material from Edward Glaeser, *Introduction*, AGGLOMERATION ECONOMICS, edited by Edward Glaeser. (2010).

[153] David Albouy, *Are Big Cities Bad Places to Live? Estimating Quality of Life across Metropolitan Areas*, National Bureau of Economic Research, Working paper 14472 (2011).

[154] See, Linda N. Edwards and Elizabeth Field-Hendrey, *Home-based Work and Women's Labor Force Decisions*, 20 JOURNAL OF LABOR ECONOMICS 170 (2002).

[155] Survey data indicates that WFH saves employees approximately 70 minutes a day on average. Approximately 60 minutes of this is a result of the worker no longer having to commute, and the rest (approximately 10 minutes) from less preparation getting ready for work in the morning! Employees spend 28 minutes getting ready when they travel to work vs 19 minutes when they work from home! These time savings benefit both workers and employers, as half of the time is spent working longer and the other half going to leisure activities. See data from https://wfhresearch.com/

[156] Alexandre Mas and Amanda Pallais, *Alternative Work Arrangements*, 12 ANNUAL REVIEW OF ECONOMICS 631 (2020).

could be due to several factors discussed in the prior paragraph, for purposes of this discussion we focus on the cost-of-living differences across states or metropolitan areas. Several large firms have recently announced that firm wages will be different for teleworkers than for in-person workers. For example, it has been reported that Google will reduce the pay of remote workers living in lower cost of living areas outside of the central cities. Attention to this issue has partially been driven by the pandemic, but Google notes that its policy are not a product of the pandemic: "Our compensation packages have always been determined by location, and we always pay at the top of the local market based on where an employee works from."[157] For example, for Google's New York City office, it is expected that a teleworker from Connecticut would be paid 15% less than an in-person worker in the NYC office or a teleworker from New York City. A worker leaving San Francisco for remote work from Lake Tahoe would face a pay cut of 25%.[158] Facebook made the same warning. According to Mark Zuckerberg, "those who flee to lower-cost cities 'may have their compensation adjusted based on their new locations.' He ominously added, 'We'll adjust salary to your location at that point. There'll be severe ramifications for people who are not honest about this.'"[159] While a salary cut may seem difficult to impose on some workers, the reality is that remote work allows firms to hire workers anywhere. A new worker accepting a job from a low-cost place needs less compensation because wages no longer need to compensate for high prices and commuting costs.

In addition, ignoring cost of living differences discussed in the prior paragraph, if working from home is viewed as an (untaxable) fringe benefit (much like an excellent employer sponsored health plan or an office with a view), then employers may be able to pay lower wages because WFH acts as an amenity that is valuable for workers. Mas and Pallais[160] conduct a field experiment with national scope. The experiment builds in choices into the application process for a national call center. The authors find "the average worker is willing to give up about 8 percent of wages for this option. Twenty-five percent of applicants are willing to pay at least $2.45 per hour, or about 14 percent of wages, to work from home. Yet, approximately 20 percent of applicants choose to work exclusively on-site even when there is no wage penalty for doing so."[161] The authors also show that female workers, especially with children, are willing to take a large wage cut to work from home. Whether the pandemic will change the preferences of workers who previously choose to work on-site remains to be seen, but initial survey evidence indicates that 36% of workers would start looking for a new job if their employer announced he needed to return to full-time in-person work and 6% would just flat out quit.[162] All of this points to WFH being an untaxed amenity for some individuals, while others have a negative view of WFH and thus prefer returning to in-person work.

The rise of teleworking may allow companies to be able to hire better workers – because they are no longer constrained to hire workers willing to live in their (possibly) expensive metropolitan area – and allow them to do so at a cheaper price. In this way, companies can now hire the best and the cheapest workers around the world. But there may also be far reaching consequences: salaries for workers in San Francisco and other large cities may fall as the supply of workers increases, because of a previously local labor market becoming global in scope. The downward pressure on wages in a state (and on the number of workers in

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[157] See, Gabriella Miranda, *Google Employees Could Face Pay Cuts if They Choose to Permanently Work from Home*, USA TODAY (August 11, 2021). Available at: tinyurl.com/yyydyjfb

[158] See, Jack Kelly, *Google May Cut The Pay Of Remote Workers*, FORBES (August 11, 2021). Available at: tinyurl.com/bdd9zbys

[159] See, Jack Kelly, *Facebook CEO Mark Zuckerberg's Power Move May Be The Biggest Game Changer For The Job Market*, FORBES (May 22, 2020). Available at: tinyurl.com/2p93b29u

[160] Alexandre Mas and Amanda Pallais, *Valuing Alternative Work Arrangements*, 107 AMERICAN ECONOMIC REVIEW 3722 (2017).

[161] Id. at 3742.

[162] See, Jose Maria Barrero, Nicholas Bloom, and Steven Davis, *Let Me Work from Home, or I Will Find Another Job*, VoxEU (July 27, 2021). Available at: https://voxeu.org/article/let-me-work-home-or-i-will-find-another-job

the state) resulting from the various mechanisms discussed above may pose challenges for states with progressive tax systems. Superstar cities no longer have as much attractiveness as when work was in-person. As the income distribution becomes more compressed, then taxes raised from the top of the distribution become a smaller share of revenue. Finally, if working from home acts as a form of untaxed compensation, wage differentials across working from home and in-person creates horizontal inequalities between workers in the same job. This is no different than the current tax treatment of compensation such as health insurance and company cars.

b. Wages and Urban Agglomeration

Economists use the term "agglomeration economies" to describe the benefits of people and firms being located close to each other in space. These benefits take the form of lower costs. Physical proximity reduces the costs of transportation, of human interaction, and of producing ideas. These benefits make workers more productive and result in higher wages. The literature on the effect of density (which serves as a proxy for agglomeration benefits) on productivity and wages is large.[163] Here we discuss some key results in the literature relevant for the taxation of incomes. Particularly important for our analysis is that some of the densest "superstar" cities are in coastal states with more progressive tax systems, so erosion of these agglomeration benefits will disproportionately affect progressive tax states.

Ciccone and Hall (1996) and Rosenthal and Strange (2008)[164] estimate the elasticity of productivity with respect to density as approximately 0.04–0.05. These authors write, "To get a sense of magnitude, relocating an individual from a work site with 25,000 workers within five miles to one with 125,000 workers [within five miles]—an amount roughly equal to a move from the 25th to the 75th percentile—would increase a given individual's wage by 2 percent." [165]

The latter article studies heterogeneous impacts and finds that this agglomeration premium is driven by proximity to college educated workers, suggesting that human capital is important. These effects then benefit college-educated workers more than individuals without college degrees. Transforming 100,000 workers in a five-mile radius of one's job from having less-than college education to a college education, raises the wages of these workers by as much as 30%. These percent changes are even larger for workers that already have a college degree. These results suggest that agglomeration forces, especially the presence of high-skilled workers nearby, enhance productivity and increase wages. Moreover, the existing empirical evidence suggests that these agglomeration benefits are highly localized in nature: they come from firms and people within very close proximity to your own job.[166]

Telework is likely to erode these physical benefits from agglomeration economies. Workers are no longer able to benefit from having others physically nearby. This can result in the decline of formal interactions between workers of one firm and workers of another firm. But the decline in productivity may also result from the decline in informal interactions – workers can no longer have lunch with workers from other firms or no longer meet in the elevator ride to the office. Based on the evidence of the economies of density,

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[163] Pierre-Philippe Combes and Laurent Gobillon, *The Empirics of Agglomeration Economies*, 5 HANDBOOK OF URBAN ECONOMICS 247 (2015).

[164] Stuart S. Rosenthal and William C. Strange, *The Attenuation of Human Capital Spillovers*, 64 JOURNAL OF URBAN ECONOMICS 373 (2008); Antonio Ciccone and Robert E. Hall, *Productivity and the Density of Economic Activity*, 86 AMERICAN ECONOMIC REVIEW 54 (1996).

[165] Stuart S. Rosenthal and William C. Strange, *The Attenuation of Human Capital Spillovers*, 64 JOURNAL OF URBAN ECONOMICS 373 (2008). See page 375.

[166] See, Gabriel M. Ahlfeldt, Stephen J. Redding, Daniel M. Strum and Nikolaus Wolf, *The Economics of Density: Evidence from the Berlin Wall*, 83 ECONOMETRICA 2127 (2015).

workers become less productive, which means that firms may lower wages as a result. Given agglomeration disproportionately benefits highly educated workers and given these workers are most likely to be teleworkers, the decline in wages and productivity could be largest at the top of the income distribution. And because many of America's largest cities are in states with progressive taxes, the implications for the tax code are stark.

If agglomeration economies no longer exist because of telework, will firms still locate in expensive urban cores and high-rise buildings? Inevitably, as fewer workers need to drive to a central workplace, the incentives to locate in urban city centers decline, especially when the business need not have a central location for consumers. Ignoring the need to have a central place, the decline of agglomeration benefits also implies that urban cores that promoted agglomeration become less valuable to the firm. As a result, we might expect that firms will relocate to cheaper (more suburban or rural) office locations. This relocation will save on high office rent that resulted from agglomeration benefits. With workers teleworking, firms no longer benefit from being in very dense areas and can save on rental space costs. Whether these rental savings exactly offset the productivity declines is an empirical question and depends on numerous factors, including the extent of rent increases in suburbia resulting from more firms locating there. If moving to the suburb makes the firm better off than staying in a downtown office location,[167] then whether these additional profits accrue to managers, shareholders, or workers, may also influence the effect of telework on progressivity.

At the same time, could telework result in new forms of productivity spillovers? If telework amplifies the ability to connect workers in San Francisco with those workers in Paris, telework could result in new forms of knowledge spillovers that result not from physical connections but from digital connections. While such a result is possible, these digital connections via services like email or skype were available well before the pandemic. The question is whether the pandemic changes the culture of these interactions to provide productivity gains by being able to link workers around the world.

Even if telework reduces the benefits of agglomeration, employers could prohibit telework arrangements. At the same time, if these agglomeration benefits are heterogeneous across industries, then some firms may still offer telework arrangements. If the skill set of workers across these industries are similar, then workers may have a choice between teleworking and non-teleworking jobs. As COVID-19 has made telework more attractive for many individuals, the presence of some industries that do not have agglomeration benefits, may force industries with agglomeration benefits to offer telework options (even though it is bad for worker productivity) to attract the best workers who have outside options in telework jobs. Such a logic is consistent with recent increases in resignations from firms returning to in-person work.

What are the implications of agglomeration for progressive tax policy? Anecdotal evidence suggests that high density areas like California and New York have some of the highest income tax rates. This could partially be a result of these states having a high concentration of high-income workers and of superstar cities. The literature has attempted to study this question by looking at whether places with more agglomeration have higher taxes. Unfortunately, most of this literature addresses business taxes or consumption taxes, but the results can intuitively be extended to the income tax context.

Numerous articles find that places with more agglomeration levy higher business taxes.[168] The basic intuition on the business tax side is simple: agglomeration economies reduce the sensitivity of firms to tax differentials. Intuitively, all else equal, higher agglomeration economies make firms more profitable and

[167] To be clear, this thought experiment is about whether the firm is better off holding fixed the number of teleworkers.

[168] See, Hyun-Ju Koh, Nadine Riede, and Tobias Böhm, *Do Governments Tax Agglomeration Rents?*, 75 JOURNAL OF URBAN ECONOMICS 92 (2013); Jordi Jofre-Monseny, *Is Agglomeration Taxable?,* 13 JOURNAL OF ECONOMIC GEOGRAPHY 177 (2013); Marius Brülhart, Mario Jametti, and Kurt Schmidheiny, *DO AGGLOMERATION ECONOMIES REDUCE THE SENSITIVITY OF FIRM LOCATION TO TAX DIFFERENTIALS?*, 122 THE ECONOMIC JOURNAL 1069 (2012).

make these firms more willing to pay a higher tax rate. Another way of saying this is that agglomeration economies generate rents that are taxable by the jurisdiction. As telework lowers the benefits of agglomeration, the ability of governments to levy higher taxes declines and we might expect tax rate convergence between big/dense jurisdictions and smaller/rural jurisdictions. The implications for progressive personal income taxes are slightly different. Even if workers remain taxed by the same state (in other words, if teleworkers do not leave the state, but simply WFH in the suburbs surrounding the city center they previously worked in), wages may fall as productivity declines. The decline in wages – likely at the top of the distribution – means that high density states see a more compressed income distribution. This compression of the income distribution means the state can raise less revenue from the very top of the distribution, which in turn, may place downward pressure on tax rates. Even if tax rates do not adjust, if high income earners see lower wages, the existing tax system will be able to redistribute less.

c. Wages and Productivity from Home

An open question, for which we do not have empirical evidence during the pandemic specifically, is the effect of working from home on productivity. Of course, agglomeration economies may weaken when individuals WFH – individuals may not have meaningful interactions with workers at nearby forms resulting from informal conversations over lunch or in riding an elevator. Ignoring these issues of agglomeration economies discussed above, are workers simply less productive when working from home than working from the office? If so, why are firms willing to allow workers to work from home?

Some empirical evidence from prior to the pandemic suggests that workers are less productive from home. First, the education literature, which allows researchers to randomize pupils into different learning modalities, indicates that virtual learning results in worse outcomes for students.[169] In terms of the mechanism underlying this result, survey evidence indicates that students assigned to online classes perceive a lower ability to concentrate or focus. Online students also felt less connected to their peers. At the same time, online students felt much less connected to their instructors and felt their instructors cared less about them than in-person students. But, the link between education and WFH productivity is not clear. While the first two mechanisms explaining the lower grades of online students (lack of concentration, less connection to peers) may apply to WFH arrangements (less monitoring/focus, less connection to coworkers), the latter two reasons (less connection/care with instructor) are not clearly linked to WFH. Moreover, college students might represent a different population of individuals. Nonetheless, the negative effects of online education on learning, suggest a similar mechanism could arise for telework. If these lower the productivity of workers, then wages may fall.

In the pre-pandemic world, an article in the *Quarterly Journal of Economics*, randomized Chinese call center workers into WFH or in-person work.[170] Home working led to a 13% performance increase. In terms of the mechanisms of this increase, the first 9% was from working more minutes per shift: workers took fewer/shorter breaks and had fewer sick days. And the remaining 4% was attributed to more calls per minute, perhaps due to a quieter and more convenient working environment. Obviously, this latter effect might be very different for families with children at home. Of course, the external validity of this study can be debated – call center workers might be viewed as different from the sectors we think telework will influence in the United States.

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[169] Michael Kofoed, Lucas Gebhart, Dallas Gilmore, and Ryan Moschitto, *Zooming to Class?: Experimental Evidence on College Students' Online Learning During Covid-19*, IZA, Discussion Paper 14356 (2021).

[170] See, Nicholas A. Bloom, James Liang, John Roberts, and Zhichun Jenny Ying, Does *Working from Home Work? Evidence from a Chinese Experiment*, 130 THE QUARTERLY JOURNAL OF ECONOMICS 165 (2015).

As we discussed previously, working from home saves commute times, and survey evidence suggests that some of these time savings result in workers working longer from home. These can be viewed as productivity gains that benefit the employer. The effect of whether working from home lowers productivity remains understudied, but the literature above suggests that it is possible that wages could also fall because of productivity losses. But, then if WFH is productivity losing, employers may ban such work arrangements. But pressures from workers, who have resigned due to a lack of flexibility, provide a countervailing force.

IV. TAX POLICY RESPONSES TO THE REMOTE WORK REVOLUTION

The analysis in Part III suggests several insights, some already familiar and others more tentative in nature. We first provided state-level tax data over the past four decades to illustrate the degree of income tax progressivity and the state level, as well as comparisons across states. We then considered both theoretical considerations and empirical data on the question of the extent to which taxpayers respond to these interjurisdictional tax differences. Finally, we considered how remote work is likely to alter these dynamics, not only by reducing the costs of taxpayer mobility but also, potentially, through more fundamental changes in the structure of cities, the distribution of wages, the nature of compensation. We now turn to the effect that alternative legal interventions might have on these developments. Section A below returns to the question raised in Part II – i.e., the income tax sourcing rules for cross-border remote and the legal controversy underlying the recent *New Hampshire v. Massachusetts* litigation.

A. Alternative Sourcing Rules for Income from Remote Work

We consider three possible sourcing rules that policymakers could adopt to address the issue of remote teleworking. In each case, the rule could be either allowed or required. Of course, operationalizing any sourcing rule through nationwide mandate would require either a definitive statement of the law from the U.S. Supreme Court or federal legislation enacted by Congress, both of which we consider unlikely. However the rule comes about, whether by mandate or otherwise, our chief interest here is in exploring the consequences for taxpayer mobility and, by extension, the continued viability of progressive state income taxes.

(1) *Source to the Employee's Physical Workplace*—i.e., sourcing the income to the state where the employee physically performs services. We will refer to this as the Employee State and in the WFH setting would ordinarily (but not necessarily) be the employee's state of residence.

(2) *Source to the Employer's Location* – i.e., sourcing the income to the state where the benefit of the employee's services is received. We will refer to this as the Employer State. In most (but not necessarily all) cases, this would be the location of the employer. It might also be thought of as the location where the benefit of the employee's services is received.

(3) *Apportionment Between/Among States* – i.e., apportioning the income of remote workers between (or among) states with a claim under either of the first two approaches.

In addition to these three approaches, we consider a fourth alternative, which might be thought of as a variation on an apportionment approach – i.e., subjecting remote teleworkers (or some other category of "interstate" employees) to a single, uniform federal income tax, the proceeds of which would be shared among the states according to some formula.

1. Sourcing Remote Worker Income by Employee's Physical Workplace

As described above, sourcing an employee's wage income to the state where she physically performs the services is the most common approach that states currently follow. In most cases, this approach also likely accords with ordinary intuition regarding where income is earned. An Apple, Inc. employee who lives and works full time in Chicago most likely assumes that Illinois has exclusive jurisdiction to tax her wage income. The notion that some other state—whether it is California where Apple, Inc. is headquartered or another state that is home to the division in which the worker is employed—would likely surprise this worker, particularly if she never "sets foot" in that state. There is something to be said for legal rules that are consonant with ordinary intuitions. In addition, the case for a physical presence rule is bolstered by the fact that this worker is a member of only one political community (Illinois) and most of the public services she consumes are provided by Illinois.[171] Recall the argument advanced by T.S. Adams in support of the Wisconsin rule that the taxpayer owes "fiscal allegiance to the jurisdiction in which their persons are protected and their children are educated."[172] If the public services from which the taxpayer benefits are indeed provided chiefly by her state of residence, then this approach (mostly) aligns taxes and benefits. All of these factors caution against wholesale abandonment of a physical presence rule as the touchstone for sourcing wage income.

Nevertheless, there are countervailing considerations that weigh against an overly rigid adherence to a physical presence sourcing rule. In a world where work can be undertaken from anywhere, strict adherence to a physical presence rule enables taxpayers to structure their work/living arrangements in such a manner to avoid sharing in the cost of public services that make possible the economic opportunities from which they are benefitting via their job. This is of course a modern version of the argument that Seligman and others made in favor of applying the New York income tax to commuters. Viewing the matter this way points to the possibility that taxpayers may have a fiscal obligation not only to the state where they live but also the state from which they derive their earnings. The physical presence rule prioritizes the former obligation while allowing the employee to escape the latter. Arguments for that ordering of fiscal obligations are not without merit; but neither are they obvious and definitive.

Perhaps the most crucial factor counseling against a priority for the state of residence is the shift in incentives such a rule would engender. In any decentralized multijurisdictional setting, taxpayers can exercise the exit option, leaving one state in favor of (presumably) greener fiscal pastures elsewhere. Such choices are of course a core feature—indeed, many would say a first order benefit—of fiscal federalism. But ordinarily exit entails departure in the important sense of forgoing the benefits of association with the exited jurisdiction. In the context of physical commuting, change of residence alone does not relieve the employee from her income tax obligation to the source state; she must also give up her job there in order to avoid the source state's income tax burden. Remote work arrangements allow parties to straddle two jurisdictions, with an employment relationship in one (home to the employer) and residence in the other (where

[171] One might respond to this point by noting that public services consumed by nonresidents are not likely to be markedly different as between those who physically commute into a state and those who work remotely for a firm located in another state. The relative amount of public services consumed by the nonresident in these two situations is of course an empirical question, but whatever the answer is the point in the text begs the question: why should the nonresident's income tax liability be a function of the public services she consumes? There may well be valid reasons for linking nonresidents' tax liabilities to the public services they consume, but if so that would also seem to argue in favor a more explicit accounting of taxes versus benefits not just for remote workers but also for those who physically commute into a state.

[172] Id. at 569.

the employee works). To the extent that WFH trends persist or accelerate, we should expect continued reliance on physical presence sourcing to intensify the progressivity-limiting dynamics of federalism.

These new pressures derive chiefly from two separate but related forces. First, current residents of high-tax states would be able to change their residence to a low-tax state without changing their jobs. Under a rule that sources remote worker income to the physical location of the employee's workplace, this change in residence would result in an erosion of the tax base in the (former) state of employment in favor of the employee's new lower-tax state of residence. The biggest difference tax-wise would be in moving from a state with a high level of progressive taxes (e.g., New York, California) to a non-income tax state (e.g., Nevada, Texas, Florida). Second, current residents of low-tax states could change jobs by working remotely for a firm in a high-tax state. Here again the fiscal shift is the same. A job that previously may have been undertaken in person in a high-tax state (generating personal income tax revenue for the source state under the New York model) is now undertaken remotely in a low-tax state. Once again, the tax base shifts from the high-tax jurisdiction to the low-tax jurisdiction. It is impossible to say *ex ante* what the magnitude of the fiscal effects would be from these types of cross-border remote work arrangements. Whatever the magnitude, however, it is the high-tax states that are home to country's major urban agglomerations that are likely most vulnerable to an erosion of the income tax base.

To summarize, the chief benefits of sourcing the income of employees derived from out-of-state employers to the physical location where the labor is performed are that this approach: (1) accords with current practice as well as ordinary intuitions about where income is earned, and (2) aligns taxing rights with benefits received, at least in cases where the employee works from her state of residence. On the other hand, this sourcing approach would likely (1) facilitate tax-motivated migration by shielding employees from fiscal obligations to the employer state, and (2) intensify the progressivity-limiting dynamics of federalism. In short, rigid adherence to a rule sourcing income to the employee's physical workplace renders vulnerable the tax base in high-tax coastal states that are most reliant on progressive income taxes.

2. Sourcing Remote Worker Income by Employer Location

The chief alternative to sourcing wage income according to the physical presence of the employee is to base taxing rights on the location of the employer. Under this approach, if a remote employee relocates her residence to a low-tax state but maintains an employment relationship with a firm located in a high tax state, or if a current resident of low-tax state takes a new job with a firm in a high-tax state, it would be the state of the employer that determines the worker's income tax obligations. We might think of this approach as a version of New York's controversial "convenience of the employer" but on steroids. It is also the rule that Professor Ed Zelinsky warned of in his *amicus* brief example of California (hypothetically) attempting to tax a Montana resident simply because she works for a call center located in California.

Like any legal rule that gives taxing rights to the "source" state, the strongest argument in favor of this approach is that it is the state of employment that makes possible the economic opportunity from which the employee is benefitting. The economic success of America's large centers of agglomeration (e.g., New York City, Silicon Valley) is a function not only of private enterprise but also massive public investment over many decades. In the more conventional case involving a nonresident employee who physically commutes into another state for work, the imposition of an income tax by the source state might be justified on two separate rationales: (1) the employee is imposing public service costs on the source state that it is entitled to recoup, and (2) she is availing herself of an economic opportunity in the state, access to which it can condition on payment of an income tax. While the absence of physical presence in the state may reduce certain costs in rationale (1), there is nothing about rationale (2) that turns on physical presence. In addition, it is difficult to regard as wholly irrelevant the fact that, as we explained earlier, the whole concept of

"physical presence" has faded in legal significance over the years. For some time now physical presence has been considered irrelevant to the question of whether a state can impose a corporate income tax on firms doing business in the state. And in the context of retail sales taxes, the U.S. Supreme Court has now definitively repudiated physical presence as a constitutional requirement for the imposition of a tax collection obligation on out of state firms. If physical presence is now irrelevant in the context of corporate income taxes and retail sales taxes, it is difficult to see why it should continue to have any sway in the case of personal income taxes.

In our view, the chief difficulty associated with sourcing remote worker income to the location of the employer is not the legal obstacle. Constitutional doctrines concerning state taxing authority generally favor the taxing states, and we believe that, on balance, those rules would favor states that seek to tax the personal income of nonresidents employed by in-state firms. The problem derives instead from the ability of firms to restructure cross-border employment arrangements to avoid exposing their nonresident remote workers to taxation in high-tax states. In some cases, there may be practical obstacles to that restructuring. For example, Professor Ed Zelinsky is employed as a full-time faculty member at Cardozo and the law school is unambiguously located in New York. That basic fact makes it relatively easy to conclude that his income is New York source income, even if he chooses to work at home. But other firms may be better positioned to establish more attenuated employment relationships so that remote workers are only working for, say, a Nevada LLC, and only indirectly for a firm that has an unambiguous business relationship with a high-tax state. At the extreme, the phenomenon of "virtual firms" with no fixed location anywhere could become more widespread, frustrating the efforts of tax administrators in high tax states to finding any connection with nonresident remote workers.

As an alternative to sourcing employee income to the employer state, another approach would be to rely on payroll taxes imposed at the firm level. Shifting the tax burden from the employee to the employer arguably strengthens the argument in favor of the source state's taxing power. In part, this also can be viewed as the business paying the state for any business public services it received from locating in the state. Thus, an alternative solution would be to convert taxes on individual earnings paid by the worker into payroll taxes paid by the employer. Given the distinction between which side of a market pays the tax is often immaterial to its incidence, more reliance on a payroll tax has the advantage of avoiding the complex debate over where earnings should be sourced. On the other hand, remote work could even pose challenges for payroll taxes: in the case of multi-state firms, if a worker conducts all work remotely without ever setting foot into a state, is that worker on the payroll of the branch in high-tax California or low-tax Florida? Presumably the answer to this question is that the employer will shift entirely remote workers to branches in the states with the lowest payroll taxes. Thus, remote work allows for the mobility of payroll by firms adjusting the branch that its workers officially are on payroll for.

It also bears noting that payroll taxes are usually levied at a flat rate on the total payroll of the company, rather than at progressive rates based on the employee's total income. Because paid by the employer, the payroll tax is usually not taxpayer-specific, in part because employers do not have access to the wealth of information necessary to personalize a tax like the individual income tax. This is not to suggest that it is impossible to introduce some progressivity into an employer-based payroll tax, but doing so would be a heavier lift from an administrative perspective. In sum, the chief benefit of sourcing remote worker wages to the employer state, rather than to the state of the employee's physical workplace, is that such an approach is more likely to preserve the ability of states currently hosting large urban agglomerations to rely on nonresident employees as part of their progressive income tax systems. However, this point is subject to two important caveats. First, it is not self-evident (and certainly not universally agreed) that this is necessarily a "benefit" of this sourcing rule. Indeed, some readers may bristle at the notion that nonresidents with no physical connection to these states should be roped into these state's progressive tax systems. Second, any rule that turns on "employer location" is likely vulnerable to planning strategies that shift the sourcing of

nonresident remote worker income to states with friendlier. Although it is difficult to predict precise effects, our sense is that this sourcing approach may best preserve the taxing rights of source states only in the short to medium term.

3. Apportionment Between/Among States

A third option for sourcing the income of cross-border workers would split the baby—i.e., a sharing of the tax base between the employee's physical workplace and the location of her employer. It is hard not to be drawn to this approach as a compromise solution to the problem.[173] After all, both the employee's state of residence and the source state have legitimate claims to tax the worker's income. In theory at least, an apportionment approach has the potential of respecting the legitimacy of both states' claims, seeking not to prioritize one over the other but rather requiring both to partially cede taxing authority in the interests of comity and (hopefully) administrative simplicity. Moreover, apportionment is the standard approach for dividing the income tax base of multistate businesses, whereby states tax only a portion of each taxpayer's income determined by reference to a formula based on the taxpayer's property, payroll, and/or sales.[174] A similar approach could be used to apportion the personal income of remote workers between physical workplace and the location of the employer.

One difficulty with an apportionment approach is that, in the absence of some mandatory apportionment regime, it merely repackages the states' competing claims into a debate over *how* to apportion the income of remote workers. For example, one "apportionment" approach would be to divide up each remote worker's personal income based on her physical working days in the two states. Thus, if the worker never sets foot in the state where her employer is located, instead completing the entirety of her work remotely in her state of residence, then this apportionment approach would result in 100 percent of the income being apportioned to the state of the worker's physical workplace. An alternative apportionment approach would be to divide the remote worker's income between the states based on where the benefit of her services is received. Such an approach would result in 100 percent of the income being apportioned to the state of the employer's location. Clearly neither of these "apportionment" solutions has the effect of dividing up the tax base. Indeed, if the state where a remote employee works from home adopts the first approach, while the state where her employer is located adopts the second, then the employee would be taxed on 200 percent of her income. This is not division at all but rather multiplication.

If the aim of apportionment is to ensure a *division* of the tax base between or among states with competing taxing claims, it would require agreement and coordination among the states, whether via interstate compacts or federal legislation. Nothing is impossible, but the prospects of such an agreement seems sufficiently remote to make it a non-starter. In the 111 years since Wisconsin enacted the first modern income tax, there has been little effort to coordinate the taxation of cross-border workers, except for a handful of reciprocity, agreements among select states, chiefly in the Midwest. Moreover, unlike bilateral reciprocity agreements, which have historically been designed for dealing with cross-border commuters, remote workers need not locate in adjacent states, but rather may be spread across many far-flung states, necessitating even more politically challenging interstate compacts. In our view, it is a worthy project to consider the role that reciprocity agreements (as well as interstate compacts or federal legislation) might play in addressing the tax

[173] For a discussion of this approach, see Darien Shanske, *Agglomeration and State Personal Income Taxes: Time to Apportion*, 48 FORDHAM URBAN LAW JOURNAL 949 (2021).

[174] See, Uniform Division of Income for Tax Purposes Act, Article IV of the Multistate Tax Compact. See https://www.mtc.gov/Uniformity/Article-IV.

treatment of remote workers, but given the strong emphasis in the U.S. context on state fiscal autonomy, coordinated mandatory apportionment seems the least likely of the three.

A variation on an "apportionment" approach would be for Congress to prohibit the imposition of a state income tax on remote workers (or cross-border workers more generally) and instead impose a special federal tax, perhaps at a blended rate of the state income taxes, coupled with an allocation of the revenues from this federal tax between the two states. More generally, one could imagine a wholly different income tax regime that features (1) a prohibition on state personal income taxes, (2) a special supplemental federal income tax that applies nationwide, and (3) a system of federal grants allocating the revenue derived from the new special federal tax among the states. One benefit of this approach is that the new special supplemental federal income tax could be made to apply regardless of the physical workplace of the employee or the location of her employer. In other words, the behavioral distortions arising from efforts to exploit cross-border labor income tax differentials could be eliminated. Because it would apply on a nationwide basis, the employee's tax burden would remain constant regardless of where she lives or where she works. However, even such an approach comes with some distortions: a worker currently living and working in high-tax California may then be induced to seek out remote work to pay the lower blended rate. Such a distortion could only be eliminated with a federal tax apportioned to the states on all workers, but such an approach eliminates the possibility of decentralized redistributive policy tailored to meet the preferences of different states. This federal system raises questions over how to divide revenue from this tax among the states. Here again, from a policy perspective this is an attractive solution, but as a practical matter, we are skeptical that such a solution is likely to materialize in the U.S. setting, given longstanding political and institutional pressures in favor of state fiscal autonomy.

B. Reforms to Address the Deglomeration Effects of Remote Work

The sourcing rules discussed above address one challenge posed by remote work – i.e., the ability of workers to exploit cross-border labor income tax differentials more easily. But this is not the only challenge telework poses for progressive income taxes. As discussed in Part III above, remote work also has the potential of changing the basic economics of city structure by eroding the wages of high-income workers, especially in sectors with agglomeration benefits and in urban centers with a higher cost of living. Such changes, should they materialize, are not likely to be influenced by reliance on one type of sourcing rule or another. The sourcing rules we discussed above relate to the taxing rights of states as to cross-border remote workers – e.g., can Massachusetts impose an income tax on New Hampshire residents working remotely from home for Boston firms even if those workers never set foot in Massachusetts? That is an important legal question, to be sure, but if remote work trends accelerate over time, undercutting the very logic of urban spatial clustering, then no sourcing rule of any variety will preserve the taxing power of states that host today's superstar cities. Put differently, even if deglomeration is a wholly *intrastate* phenomenon (e.g., workers abandoning San Francisco to work remotely from Vacaville) the economic effects for superstar cities could still be significant, as firms may be expected to reduce the wages of employees working remotely from low-cost exurbs. And just as agglomeration enhances the taxing power of governments home to urban powerhouses, so too would deglomeration diminish that power. In short, remote work poses challenges to income tax progressivity that go beyond the state's power to tax nonresident remote workers.

1. *Technology and Tax Reform: A Parallel in the Experience with Retail Sales Taxes*

This is not the first time that technological change has threatened state tax systems in a way that could not entirely be fixed by sourcing rules. The recent rise of e-commerce and mail order houses raised similar

questions by severing the link between the place of consumption and the place of purchase. Prior to e-commerce and mail order catalogs, absent a small amount of cross-border shopping that could occur in metropolitan areas, individuals purchased goods in the same state that they lived. Then, internet sales allowed individuals to buy goods from any state or even country in the world. Supreme Court rulings, codified in *Quill*, created tensions over the taxing rights of these out-of-state transactions by declaring states could only require vendors to remit taxes when the vendor has a physical presence in the state. While this did not preclude the destination state from taxing out-of-state sales, as states could still compel consumers to remit use taxes, the difficulty of enforcing such taxes meant the destination state effectively had no taxing ability over those transactions. The recent *Wayfair* decision abolished this physical presence requirement for states that meet certain conditions, effectively results in destination-sourcing of online sales from vendors with economic presence.

But, resolving the sourcing rules has not solved the new challenges created by e-commerce and remote transactions. The presence of online marketplaces and large online vendors that can acquire and ship goods cheaply means that the retail market has intensified competition relative to the days of only brick-and-mortar stores. This intense competition has likely lowered the prices of some goods in ways that reduce the taxable base, shrinking the revenue raising capability of the sales tax. These price reductions are analogous to the wage effects we might expect to arise from remote work. In addition to these price effects, e-commerce and the digital revolution have recast consumption patterns toward new forms of consumption related to digital services (social media, two-sided platforms). Because these new forms of consumption are not monetized to the consumer, taxing them under the retail sales tax base is increasingly difficult absent more fundamental reforms to the retail sales tax base.[175] This also requires creative ways to determine the value of consumption when there is no price to that consumption. Again, this links to remote work as a form of untaxable fringe benefits. These are all challenges to our system of retail sales tax system that cannot be fixed by *Wayfair* and the sourcing rules that come with it. Instead, these challenges involve a necessary broadening of the retail sales tax base to include both tangible and intangible consumption.

2. Remote Work and Fundamental Tax Reform

Telework raises fundamental issues about the taxation of income as a means of progressive redistribution. What is income? Are special taxes on top earners such as a surcharge on the rich or wealth taxes necessary? Should we follow a model where although the overall tax burden may not be progressive, the public spending system is highly progressive due to sharp progressivity in government spending?

a. Defining Income

Economics focuses on the "Haig-Simons" definition of comprehensive income as an ideal tax base.[176] Under this definition, comprehensive income includes all sources of real income net of the costs of earning that income. Whether the income is cash or in-kind, earned or transfer income, or realized or accrued does not matter. Income is anything that increases the ability of an individual to consume. Two important concepts arise from this comprehensive definition of income. First, income must be net of any expense to earning that income – only net income can increase private consumption. Second, income must reflect

[175] See, David R. Agrawal and William F. Fox, *Taxing Goods and Services in a Digital Era*, 74 NAT'L TAX J. 257 (2021).

[176] Although Haig did eventually settle on accretion income as the best feasible tax base, he believed that consumption expenditures was a better measure of income. But he ruled out this approach because of measurement challenges. See David E. Wildasin, *R. M. Haig: Pioneer Advocate of Expenditure Taxation?* 28 JOURNAL OF ECONOMIC LITERATURE 649 (1990).

changes in prices because changes in prices holding constant nominal income change the ability to consume. Thus, income should be taxed on a real basis.

Under the current system, as taxes are based on nominal incomes, workers with the same real income pay higher taxes in high-cost areas than in low-cost areas. The recent trend of tech companies to adjust wages based on the cost of living of the worker may move the tax system closer to a real income tax. But at the same time, is WFH an in-kind source of income much like a nice health insurance plan? Work from home may have some in-kind benefits if remote work allows individuals to become more effective at home production, saving on what would have been involuntary childcare costs.[177] At the same time, commuting expenses treat different workers differently. Teleworkers do not incur commuting costs while physical workers incur these costs. Under a comprehensive definition of income, all else equal, the tax system should treat these individuals differently.

Telework will force state laws to grapple with whether real or nominal income is the best definition of income, along with whether some forms of compensation are in-kind payments to workers. But it also raises an important question: should our tax base be determined using income as a base or consumption? Although Haig is often attributed as a supporter of taxing income, he writes: "Money income should, perhaps, refer to the value of the goods consumed and the services enjoyed, although in popular speech and by many economists the word is used in the literal sense of the net amount of money that comes in, whether it is spent for enjoyable things or is saved."[178] Haig believed the best tax base would be utility, but because it is unobservable, the best base would be necessary to resort to a monetary measure of utility and this would ideally be the value of the flow of current consumption.[179]

This raises the question of whether progressivity is better achieved via a progressive consumption tax rather than a tax on labor income. Although the progressive movement was originally steeped in taxing wage income, its decline in recent years has been a result of the concern that income taxation induces severe inefficiency consequences. This narrative has been used effectively by conservatives in a way that even progressives admit to the efficiency consequences of taxing income. As argued in a law article, these arguments of Ronald Reagan and others pertain to the use of income as a tax base and not the use of consumption as a tax base: "Here is where inertia plays its pivotal role: by failing to rethink initial premises regarding the appropriate tax base, we have doomed the prospects for more progressive tax rates. In this Article, we argue that switching to a spending tax base holds out the possibility for a new analysis and a return to more steeply progressive marginal tax rates".[180] While such an argument may seem surprising to some who view consumption taxes as regressive, consumption taxes can tax windfall gains from capital income if those gains are consumed. Moreover, while most retail and value added taxes around the world involve flat rates, there is no restriction per se that a consumption tax cannot be implemented with progressive tax rates.[181]

b. Alternative Taxes on Wealth and Capital Income

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[177] Any expense that represents an involuntary consumption expenditure should not be included in Haig-Simon income. See James Alm, *Is the Haig–Simons Standard Dead? The Uneasy Case for a Comprehensive Income Tax* 71 NATIONAL TAX JOURNAL 379 (2018).

[178] Robert M. Haig, *The Concept of Income - Economic and Legal Aspects*, in THE FEDERAL INCOME TAX, edited by Robert M. Haig (1921).

[179] See David E. Wildasin, *R. M. Haig: Pioneer Advocate of Expenditure Taxation?* 28 JOURNAL OF ECONOMIC LITERATURE 649 (1990).

[180] Edward J. McCaffery and James R. Hines, Jr., *The Last Best Hope for Progressivity in Tax*, 83 S. CAL L. REV. 1031 (2010).

[181] See, for example, Senator Cardin's webpage on "What Is the Progressive Consumption Tax?" available at: https://www.cardin.senate.gov/pct-what-is (accessed: December 23, 2021).

If telework compresses the (labor) income distribution across individuals, but leaves inequalities in capital income unchanged, then capital income may become a more important part of progressive redistribution. The 2020 Presidential election raised numerous questions on this topic, resulting in wealth tax proposals by presidential candidates Bernie Sanders and Elizabeth Warren. But the political decline of these candidates, coupled with constitutional questions about the ability of a federal wealth tax, has led to some state governments proposing wealth taxes or taxes on extreme wealth.[182] One argument in favor of a wealth tax is that the personal income tax, although progressive over realized income, is not amazingly effective at taxing the ultra-wealthy who do not necessarily *realize* their capital incomes: the ultra-wealthy hold many unrealized long term capital gains.

If telework condenses the wage distribution by lowering wages in sectors best suited for remote work – high-income sectors – then capital income and potentially unrealized income will play an even more prominent role in inequality. This is especially the case if any added profits resulting from telework are passed on to shareholders. In this way, wealth taxes could become more important in the states where telework erodes their historical agglomeration advantages. But wealth taxes come with their own controversies, including issues of valuation of wealth, enforceability of wealth and mobility across state borders when an exit tax cannot be used.

Other similar proposals involve eliminating the preferential tax treatment of capital gains income and the step-up-in-basis provision of capital gains. Although most states tax capital income under the same schedule as labor income, capital income has preferential treatment because it is taxed on a realization basis rather than an accrual basis. This allows individuals to defer tax liability on that income into the future. Furthermore, step-up-in-basis adds to the preferential treatment.

While taxation of capital gains raises efficiency issues like a wealth tax, an argument has been that this source of income has accrued to top individuals and thus can be justified on equity grounds. Taxing top capital income can be a very efficient way of raising tax revenue, especially when removing any retiming effects of the tax and focusing on the medium-term consequences.[183] If widening inequality is due to increases in disparities in capital rather than labor income, designing progressive taxes around this stylized fact may better achieve progressivity. For capital income taxes, states also have clear sourcing rules that tax capital income in the residence state regardless of where it is earned. If telework makes individuals more footloose, then state with high concentrations of individuals with realized capital gains may see a loss in revenue as these individuals now reside in cheaper and potentially lower tax states.

c. Progressivity Through Spending

One of the reasons that progressive policy has changed in the last several decades is the disconnect between the beneficiaries of progressive policies and voters who support these policies, partially a result of sociocultural political issues. A forthcoming article in the *Quarterly Journal of Economics*, writes: "In the 1950s and 1960s, the vote for social democratic, socialist, and affiliated parties was associated with lower-educated and low-income voters. It has gradually become associated with higher-educated voters, giving rise in the 2010s to a remarkable disconnection between the effects of income and education on the vote:

[182] Brian Galle, David Gamage, Emmanuel Saez and Darien Shanske, The California Tax on Extreme Wealth: Revenue, Economic, and Constitutional Analysis, (March 23, 2021). Available at https://eml.berkeley.edu/~saez/galle-gamage-saez-shanskeCAwealthtaxMarch21.pdf

[183] Emmanuel Saez, *Taxing the Rich More: Preliminary Evidence from the 2013 Tax Increase*, 31 TAX POLICY AND THE ECONOMY 71 (2017).

higher-educated voters now vote for the "left," while high-income voters continue to vote for the "right." ... we provide evidence that the reversal of the education cleavage is strongly linked to the emergence of a new "sociocultural" axis of political conflict."[184] In the United States, these shifts in voting patterns may also be partially a result of the decline in progressive spending policies, which perhaps peaked during the creation of Great Society and anti-poverty programs of the 1960s.

When viewing the totality of the tax and transfer system, is the European system more progressive than the U.S. system? In a forthcoming article, the authors note: "we find that Europeans are indeed more generous at the very bottom of the distribution: the bottom 20% receives 2.6% of national income in net redistribution compared to only 1.8% in the US. At the top of the distribution, a symmetrical effect is at play: the net share of national income flowing out of the top 10% group is significantly larger in the US than in Europe given that the group's average income is significantly higher than in Europe."[185] This confirms that although the US tax system is more progressive, the spending system is not progressive. Moreover, the types of things that the US spending system prioritizes are very different than in many European countries, where large scale investments are made in programs that are complementary to labor, such as childcare.[186]

The question is why do we care about progressivity in the first place? Is it because we think that Bill Gates should have half of the income that he currently does? Or is it because we want to help low-income households move to a higher standard of living? If the answer is more towards the latter question, then progressivity can better be viewed as a spending concept rather than a revenue concept. Of course, vertical equity would say that those with a higher ability to pay should pay more for these programs, but tax progressivity is simply a means to an end. If the distribution of income becomes more compact due to telework, then perhaps progressivity is better viewed as a comprehensive tax plus transfer design. In such a world, the transfer system can offset declines in progressivity because of the remote revolution.

C. Implications for Federal Tax Progressivity?

To this point in the analysis, our focus has been on the implications of remote work for state income taxes. If an increased reliance on remote work results in an erosion of agglomeration benefits in superstar cities, the compression of the urban wage distribution, and a shift to untaxed fringe benefits, states hosting these metropolitan areas will find it more difficult to rely on progressive personal income taxes. It bears noting, however, that these same dynamics also pose challenges for federal tax progressivity. Indeed, it could be the case that these concerns are more problematic for the federal tax code because the federal tax system is even more progressive than state tax systems.

On the one hand, one may wonder whether a compression of the wage system is necessarily bad. Could remote work simply achieve the same reduction in inequality that our fiscal system achieves? If so, would we care that state and federal tax systems are less progressive? We appreciate this view and agree that it has merits. If the tax system is designed to reduce top incomes, then remote work may inevitably achieve some of this by disproportionately affecting high-income workers and eroding the agglomeration benefits they receive. On the other hand, if the tax system is designed to reduce top incomes and to redistribute those incomes to low-income households, then remote work's compression of the wage distribution will not achieve this goal.

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[184] Amory Gethin, Clara Martínez-Toledano, and Thomas Piketty, *Brahmin Left versus Merchant Right: Changing Political Cleavages in 21 Western Democracies, 1948-2020*, __ QUARTERLY JOURNAL OF ECONOMICS __ (2021).

[185] Thomas Blanchet, Lucas Chancel, and Amory Gethin, *Why Is Europe More Equal Than the United States?*, __ AMERICAN ECONOMIC JOURNAL: APPLIED ECONOMICS __ (2021).

[186] Henrik Jacobsen Kleven, *How Can Scandinavians Tax So Much?*, 28 JOURNAL OF ECONOMIC PERSPECTIVES 77 (2014).

To see this, suppose that the federal government must finance a fixed amount of services such as national defense or Medicare spending. Focusing on this extreme case of fixed spending helps illustrate our point, but may also be consistent with reality where politicians are not eager to reduce popular spending programs. If top-earner wages fall but WFH does not affect the wages of lower income households, then the income tax will overall raise less revenue and it will raise a smaller share of income tax revenue from top earning households. Then, because in our example, the government must finance a given amount of services, additional taxes need to be raised elsewhere -- perhaps on middle class households, perhaps by reducing tax credits to low-income households, or perhaps by shifting toward other more regressive taxes. Thus, even though remote work may reduce inequality by compressing the income distribution, it still makes our overall fiscal system – viewed in its entirety – less progressive and many of the issues discussed in this section still apply.

D. The Future: Taxing Digital Nomads Who Work for Virtual Firms

The sourcing rules and policy reforms we discuss inevitably are aimed at solving the effect of remote work on tax progressivity as we currently know it. But technology will continue to evolve at a rate that outpaces institutions. In this section, we want to speculate about a world fifty – or perhaps only ten – years in the future where people and firms have no permanent physical presence anywhere. In such a virtual world, what should our tax system look like?

Let us first define what such a world looks like. On the employer side, one could easily imagine firms that have no physical office space, plants, or buildings in any state. Such companies would rely entirely on remote workers to produce their product, a service rather than a physical good. With workers connected through the internet, these companies might not need any in-person meetings and their employees may not need any capital to produce their services, other than a computer work-station shipped to their home by the employer. Even today, companies such as Automatic or DuckDuckGo have either no or almost no physical presence in any state.[187] On the employee side, digital nomads might spend a couple weeks living in each state or different countries around the world, never staying in one place long enough to call it a permanent home. We already have seen increases the number of ”extreme” digital nomads who work as they travel the world. Each of these two forces might come together to form a perfect storm for state tax systems: digital nomads without a physical home are likely to be young tech-savvy workers, making them a perfect fit for service and technology driven firms that are unlikely to have office space.

Such a future may have great appeal, but do the tax reforms we propose address them or does thinking about this future necessitate we abandon the current way we think about taxing income in a federal system? Where is the employer located if it has no office? Where is the employee located if she has no home? If no source or residence state can be identified, should the taxes on income be apportioned to the states based on sales (the location of the consumers)?

CONCLUSION

This Article raises many questions about the future of income tax progressivity, while providing answers to some challenges posed by the remote work revolution. As noted at the outset, the defining feature of subnational governments is *geography* – the scope of their legal authority is determined by reference to their geographic boundaries. But technological changes such as remote work erode the significance of these

[187] Felicity Hannah. *The Firm with 900 Staff and No Office*. BBC (July 5, 2019).

borders by allowing people to live and work on opposite sides of the globe. As taxpayers find themselves with a broader array of low-cost options for how to structure their lives, including the possibility of severing their place of residence from their place of work, it will become more difficult for governments, especially those defined by reference to geographic boundaries, to carry off a progressive redistribution of economic resources. At bottom, remote work is about flexibility and choice for firms and their employees, dynamics that typically constrain the taxing power of governments.

We have not taken a position in this article as to whether progressive redistribution is "good" or "bad." The degree of progressivity in any tax system is a function of several different factors, but depends most of all on collective value judgments arrived at through democratic processes. We have not sought to supplant these judgments with our own. Rather, in this article, we have proceeded from the premise that society wishes to have some amount of progressivity (or regressivity, even) through its tax laws and that these preferences for redistributive policy differ across taxing jurisdictions. Taking these facts as given, what challenges does the law face to sustain progressive redistribution in the presence of threats by a new culture of remote work that enables high-income earners to more easily exploit those differences?

In some sense, the most widely observed effect of remote work – increased mobility of households who no longer feel tied to a job location – is not a difficult issue to solve. Technological change resulting from e-commerce raised questions about how online sales should be sourced, and new court rulings and changes to state law settled this matter in a way that minimized inefficiencies. As we discuss, states and even federal interventions in the presence of remote work can assign taxing rights for remote workers in a way that is efficient and equitable. But just as e-commerce raised challenges about the taxation of new digital products and how competition from online vendors lowers prices eroding the sales tax base, so too will remote work raise additional challenges in the form of lower wages at the top of the income distribution and a shift in compensation to unmeasurable and untaxable sources of income.

The compression of the labor income distribution raises more fundamental questions about state taxation of income, which due to reduced rates on capital income, has tended more toward a wage income tax than a comprehensive income tax. These concerns that we highlight threaten state redistributive policy, but also by extension – because they influence the federal income tax base – they also pose challenges for federal redistributive policy. In some sense, these more fundamental concerns are even more problematic for the federal government, because the federal tax system – unencumbered by interstate mobility – is even more progressive than even the most progressive state tax systems. In this way, mobility via remote work that compresses the wage distribution places a new constraint on federal redistributive tax policy. Although the income tax base has been resilient and dynamic, and the income tax has risen to prominence as the dominant taxing instrument at the state level, and the federal income tax system has been the workhorse of progressivity, remote work places its future in a less optimistic perspective. Now is the time to evaluate not just sourcing rules, but what the best tax base is to implement progressive redistribution.

Beyond providing a roadmap for policymakers, this Article also raises questions for future research. What is the measurable effect of remote work on wages and agglomeration? What are the inequities created by telework? What is income and where does economic activity take place? Does someone who works for a company, but never sets foot in that company's state, benefit from public services provided to that business and make it successful? Why do we care about progressivity: because of the policies it helps or because of its effect on the income distribution?

With respect to sourcing rules, our policy proposals are focused on the taxation of remote work. But the continued rise of "digital nomads" may pose new and unpredictable challenges to our tax systems. How should the taxation of cross-border income of a United States citizen working abroad be treated? Is the answer different than or the same as the solution to the taxation of cross-state income from remote workers? And more fundamentally, does the rise of digital nomads imply the existence of a new type of taxpayer that has no physical place of work and no physical permanent residence? For other federations around the world

that operate a purely residence-based tax system, such as Switzerland or Canada, how will a citizen who backpacks around the country with no permanent domicile be treated for tax purposes? Do these same questions apply to firms that have no physical office space? Technological change will continue to provoke new challenges for our tax systems; we hope this article stimulates practical policy solutions.

PUBLICATION

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Appendix A

This online appendix first shows how states have changed their tax code over the last several decades: across-the-board increase/decreases or increases at the top/bottom at the expense of the other end of the distribution. The results are presented in Table A.1, with caveats when there are subtle differences. For purposes of this summary table, unlike the figures presented in the paper, we use a single taxpayer as the benchmark because less comprehensive credits create simpler tax changes for these households.

Then, we show the state-specific average tax rates by year. Table A.2 shows the average tax rates at all five quintiles of the income distribution in 2019 and 1980. The mean income values of each quintile are, respectively, $15,000, $39,000, $66,000, $104,000, and $238,000.

Then, this online appendix shows the tax schedules for every state in 1980 and 2019 by the four households types that we consider: single, married, married with kids, and elderly. All state figures are presented on the same axis scale to facilitate comparability across states. Because many states have exceptionally large credits for low-income households with kids, we truncate any negative average tax rate at 12%. In other words, when the average tax rate is more negative than -12%, we set it to -12%. Not doing this would result in a vertical axis scale that would not allow the reader to see variation in tax rates. Note that the common scale across states facilitates comparisons across states, but it also masks (relative) large tax changes that occur in low-tax states. Figure A.1 shows the federal tax schedules by household type, while Figure A.2, A.3, A.4, and A.5, shows the state schedules for single, elderly, married, and married with kids. The state tax schedules for each type contain four sub-figures so that the individual state graphs remain legible.

Table A.1: Classifying State Income Tax Changes Over Time (1980 to 2019)

Across-the-board Increases	Across-the-board Decreases
Alabama	Delaware
Colorado[188]	District of Columbia
Connecticut	Maine
Georgia	Massachusetts
Illinois	Michigan[192]
Indiana	New Hampshire
Kansas	New York[193]
Louisiana	North Carolina[194]
Maryland	Oregon
Mississippi	Rhode Island
Missouri	Tennessee
Montana	Vermont
Ohio[189]	Wisconsin[195]

[188] The state had some decreases at the very bottom of the income distribution.
[189] Low-income households saw decreases through an increase in the exemption from tax.
[192] The state saw some very minor decreases at middle incomes, but it is better perhaps to classify the state as showing no change.
[193] The state had some minor tax increases around the median income.
[194] The state had some minor tax increases around the median income.
[195] The state saw some very minor tax increases at the bottom of the income distribution.

Pennsylvania[190] Utah[191]	
Increase at Top, Decrease at Bottom	**Decrease at Top, Increase at Bottom**
Arizona California Hawaii Idaho[196] Kentucky[197] Minnesota New Jersey North Dakota South Carolina	Arkansas[198] Iowa Nebraska New Mexico Oklahoma Virginia[199] West Virginia

[190] Pennsylvania is unique in that its tax code is basically flat above the exemption threshold.
[191] The tax code decreased at the very bottom due to an increase in the exemption.
[196] In this state, at the very top of the income distribution, there was not much of a change because the top tax bracket remained the same.
[197] In this state, the decrease at the bottom is driven mainly by an exemption for very low incomes.
[198] In Arkansas, the decrease at the top was marginal.
[199] In this state, the decrease at the top was very minor.

Table A.2: Average State Income Tax Rates by Quintile

	2019						1980					
state	Q1	Q2	Q3	Q4	Q5	1 mil	Q1	Q2	Q3	Q4	Q5	1 mil
US	-45.73	-10.55	2.47	5.81	15.05	26.8	-8.85	7.83	13.68	19.85	33.18	43.72
AL	.73	3.41	3.6	3.6	3.31	3.03	.48	2.3	2.81	2.96	2.7	2.4
AK	0	0	0	0	0	0	0	0	0	0	0	0
AZ	-.67	.65	1.44	2.05	3.07	3.86	.08	2.5	3.73	4.21	4.04	3.7
AR	0	1.53	3.23	4.11	5.33	6	.01	1.33	2.24	3.09	4.73	5.93
CA	-3.2	0	.4	2.22	5.9	9.33	0	.91	2.39	3.91	7.19	9.26
CO	-3.64	.96	2.84	3.44	4.13	4.29	0	1.5	2.68	2.88	3.01	2.91
CT	-8.37	-1.45	3.22	4.59	5.37	6.98	0	0	.18	.36	.48	.54
DE	0	.29	2.97	3.61	4.75	5.76	.56	2.05	3.85	5.14	7.16	10.87
DC	-14.56	-1.42	3.18	4.21	6.28	7.73	-.42	3.05	3.89	4.96	6.95	8.46
FL	0	0	0	0	0	0	0	0	0	0	0	0
GA	0	2.29	3.7	4.45	4.9	5.44	-.53	1.66	3.17	3.99	4.78	5.25
HI	-1.56	1.7	4.51	5.22	7.11	9.78	-1.32	2.94	4.63	5.73	7.32	8.55
ID	-2.6	-.21	2.66	4.22	5.74	6.64	-.89	1.5	3.8	4.99	5.98	6.57
IL	-4.74	2.37	4.16	4.41	4.66	4.9	.73	1.82	2.1	2.24	2.39	2.47
IN	-1.63	2.2	2.82	2.94	3.1	3.2	.82	1.49	1.66	1.74	1.83	1.88
IA	-5.46	1.47	3.73	4.37	4.71	5.16	0	1.66	2.67	3.3	3.74	5.06
KS	-7.19	.55	2.96	3.92	4.67	5.13	-2.51	1.3	2.17	2.52	3.12	3.83
KY	0	4.34	4.58	4.59	4.6	4.6	.94	1.95	2.81	3.15	3.01	2.74
LA	-1.29	1.79	2.81	3.08	3.86	3.75	0	0	.54	1.21	1.56	2.24
ME	-3.32	-.79	2.46	3.93	6.21	7.04	0	.85	2.45	4.16	6.71	8.46
MD	-10.19	0	3.34	3.85	4.64	5.37	0	2.21	3.35	3.85	4.22	4.43
MA	-10.92	.62	3.63	4.15	4.66	4.96	0	2.98	4.03	4.59	5.25	5.71
MI	-4.67	1.89	3.12	3.53	3.94	4.18	-2.21	2.66	3.45	3.87	4.28	4.52
MN	-12.08	-3.63	2.32	3.92	5.77	8.71	0	4.79	6.73	7.72	7.94	7.61
MS	0	1.43	2.7	3.36	4.1	4.66	0	.06	1.28	2.11	2.87	3.32
MO	0	1.12	2.83	3.77	4.45	5.06	0	.97	1.82	2.21	2.52	2.63
MT	-1.04	1.15	3.09	3.99	5.35	6.47	0	1.56	2.45	3.3	4.21	5.16
NE	-3.64	-.04	2.15	3.68	5.38	6.43	0	.41	1.6	2.55	4.57	7.31
NV	0	0	0	0	0	0	0	0	0	0	0	0
NH	0	0	.09	.22	.35	.43	0	.04	.21	.3	.38	.43
NJ	-14.2	-1.62	1.55	2.48	4.41	7.09	.58	1.46	1.7	1.99	2.28	2.45
NM	-6.79	-1.06	2.17	3.17	4.25	4.62	-3.67	-.66	.79	2.14	4.57	7.06
NY	-12.68	-.83	3.14	4.26	5.9	6.56	0	2.41	4.95	7.06	8.79	10.11
NC	0	2.22	3.51	4.19	4.81	5.14	.27	1.98	3.2	4.26	5.41	6.09
ND	0	.39	.67	.84	1.46	2.25	.01	1.03	1.92	2.24	2.66	2.3
OH	0	0	1.91	2.51	3.45	4.45	.2	.63	1.38	1.92	2.69	3.17
OK	-1.07	.85	3.01	3.86	4.41	4.86	.15	.82	2.34	3.08	4.12	4.92
OR	-3.59	2.83	4.62	5.07	6.31	7.18	.28	3.24	4.63	5.27	7.37	8.61
PA	0	3.07	3.07	3.07	3.07	3.07	0	2.2	2.2	2.2	2.2	2.2
RI	-5.46	-.6	1.82	2.59	4.96	5.75	0	1.49	2.59	3.52	5.76	7.57
SC	0	0	2.41	4.05	5.72	6.23	.5	2.13	3.77	4.7	5.6	6.13
SD	0	0	0	0	0	0	0	0	0	0	0	0
TN	0	.05	.1	.13	.16	.18	.54	.54	.54	.54	.54	.54
TX	0	0	0	0	0	0	0	0	0	0	0	0
UT	0	1.34	3.35	4.41	4.95	4.95	.56	2.87	3.95	4.29	4.01	3.6
VT	-13.84	-1.8	1.86	2.67	5.09	7.84	0	1.73	3.07	4.19	6.91	10.73
VA	0	1.25	3.86	4.55	4.86	4.98	0	1.66	2.87	3.63	4.5	5.01
WA	0	0	0	0	0	0	0	0	0	0	0	0
WV	0	3	4.02	4.92	5.81	6.34	.93	1.79	2.44	2.71	4.15	6.52
WI	-4	-.28	3.06	4.38	5.22	6.62	-2	2.25	4.01	5.6	7.2	8.53
WY	0	0	0	0	0	0	0	0	0	0	0	0

Figure A.1: Federal Tax Schedules by Filing Status

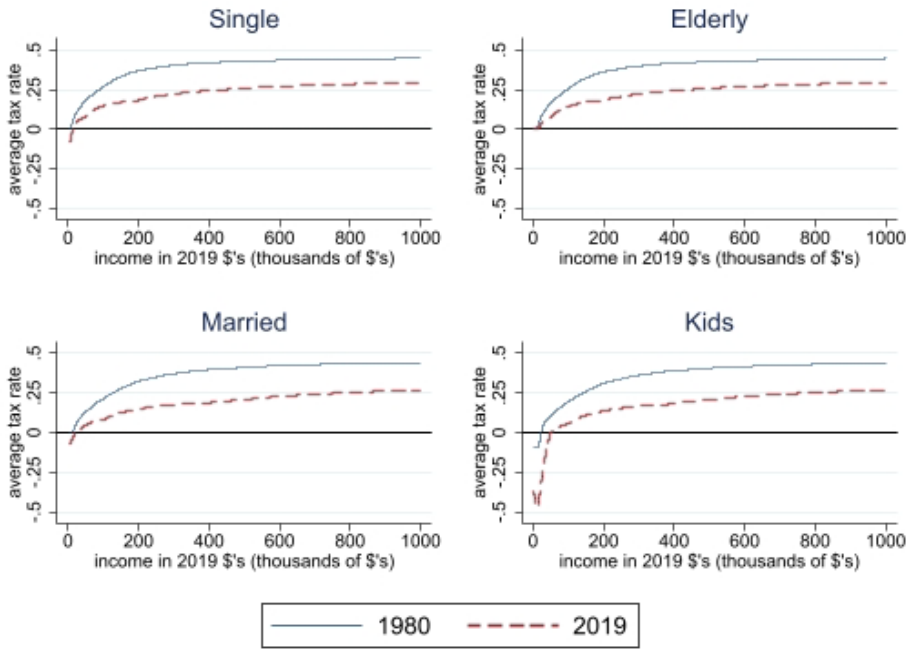
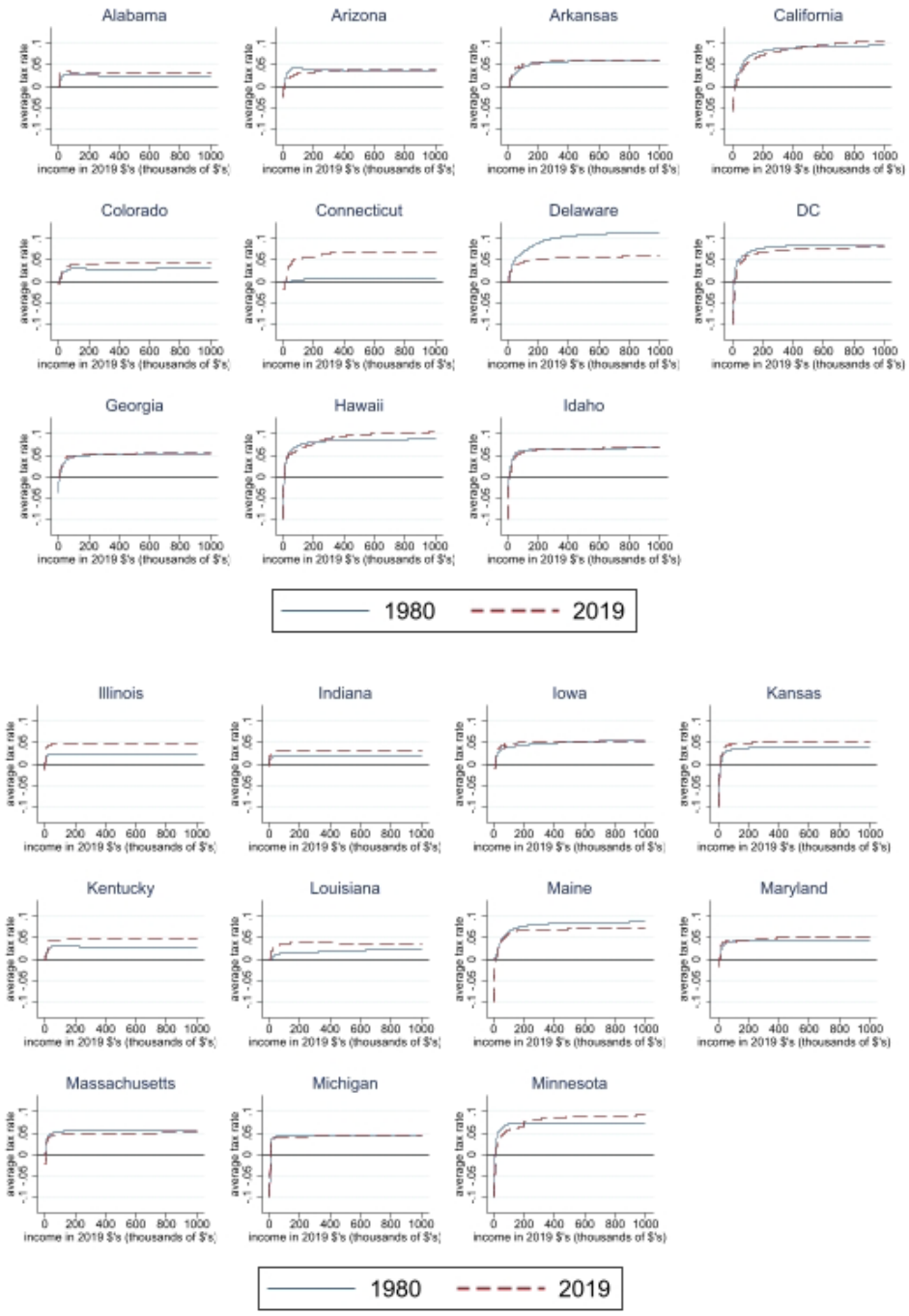
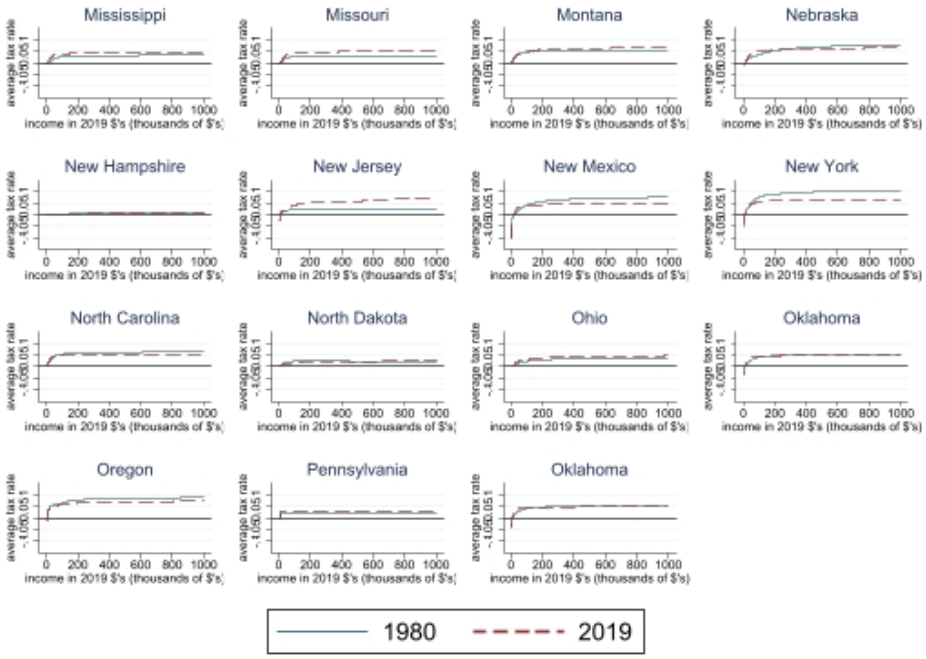


Figure A.2: State Tax Schedules for Single Households

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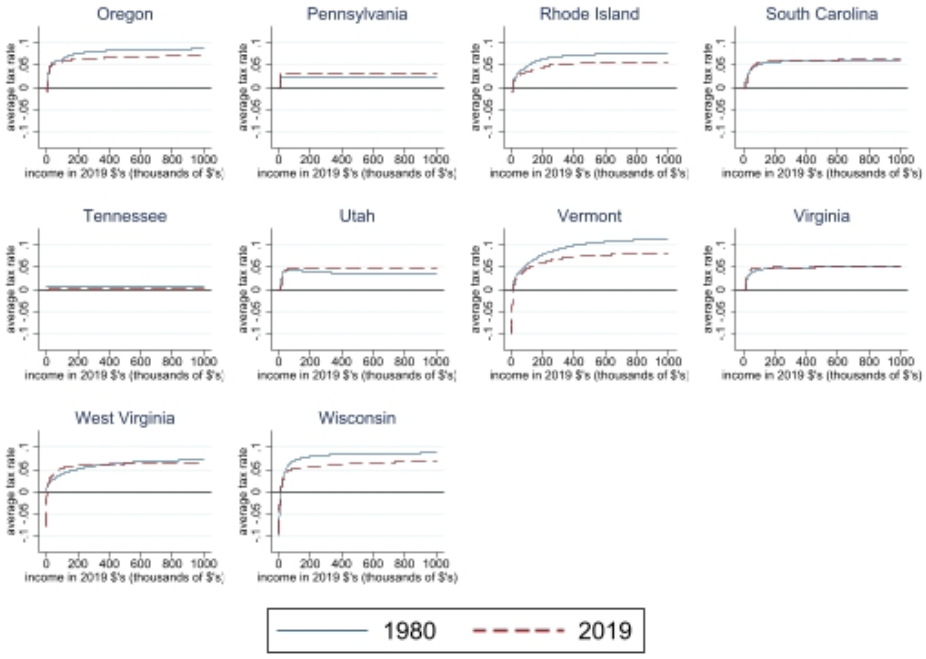
Pennsylvania
Oklahoma
average tax rate
income in 2019 $'s (thousands of $'s)
1980
2019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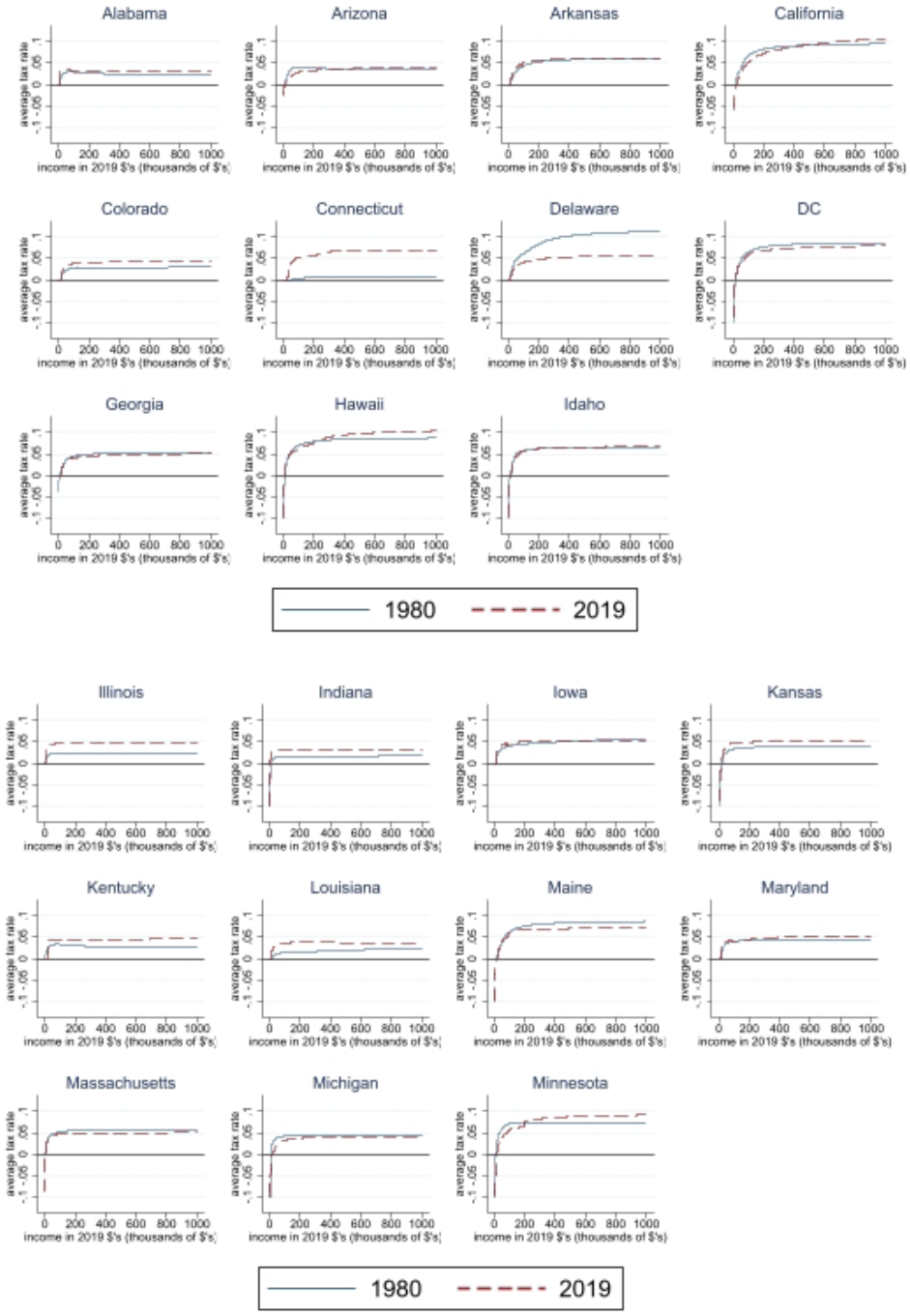
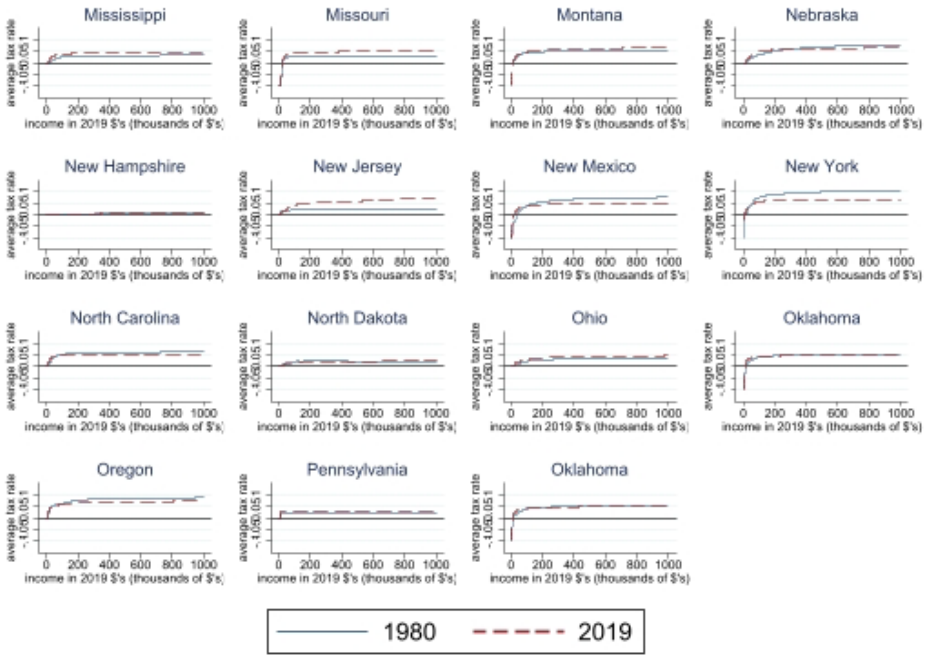
South Carolina
Tennessee
Utah
Vermont
Virginia
West Virginia
Wisconsin
average tax rate
income in 2019 $'s (thousands of $'s)
1980
2019

Figure A.3: State Tax Schedules for Elderly Households

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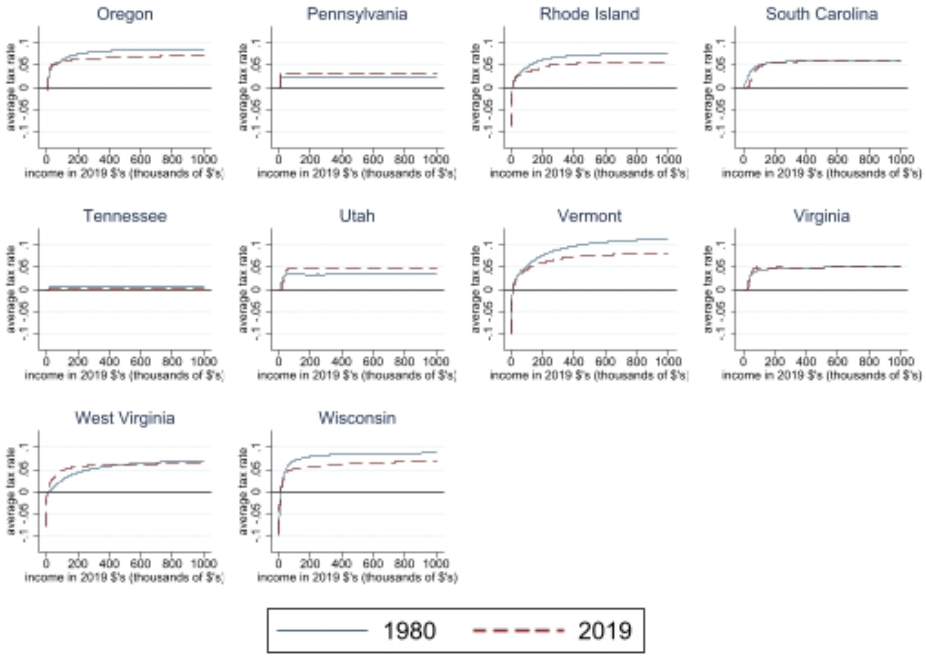
average tax rate
income in 2019 $'s (thousands of $'s)
1980
2019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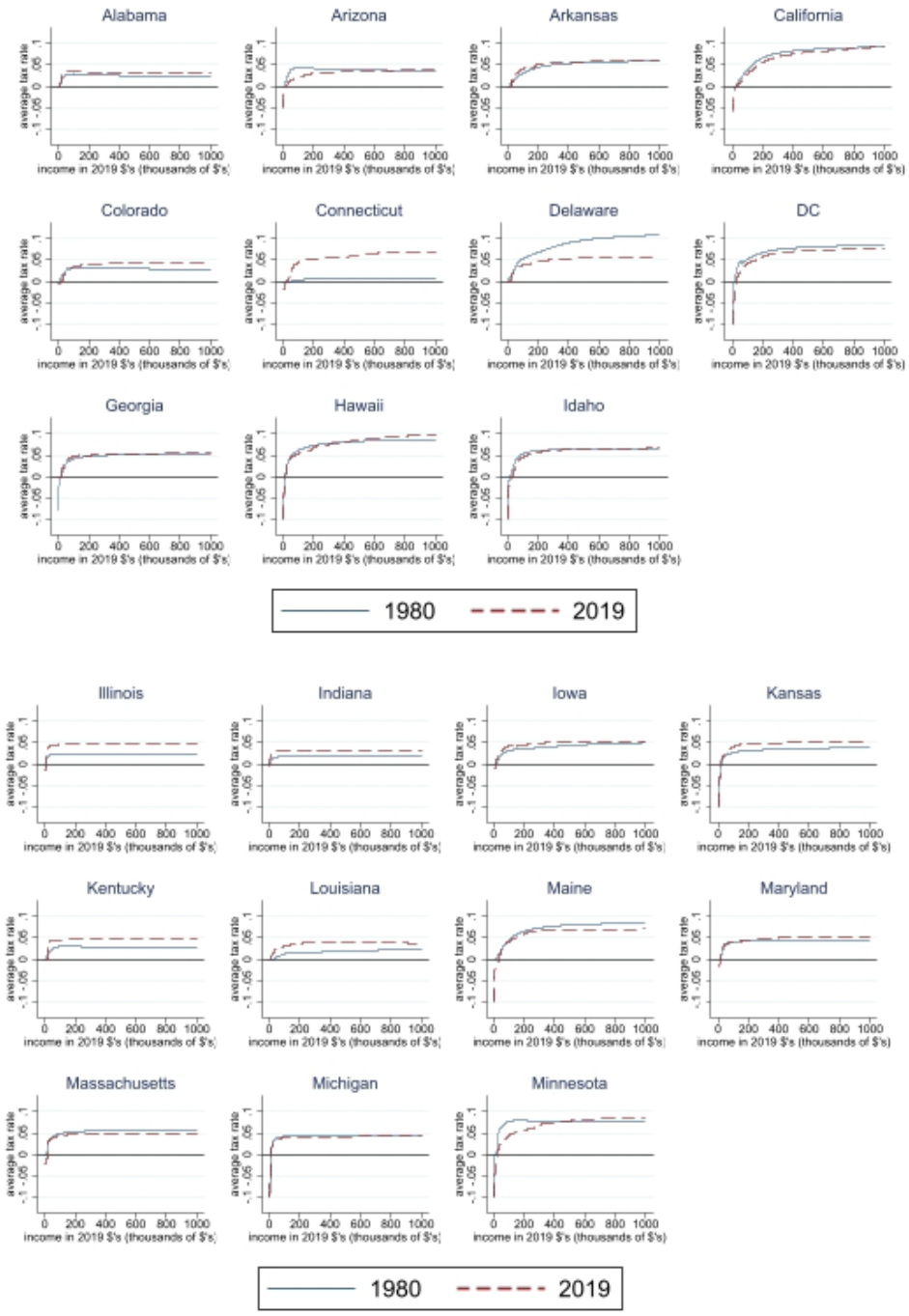
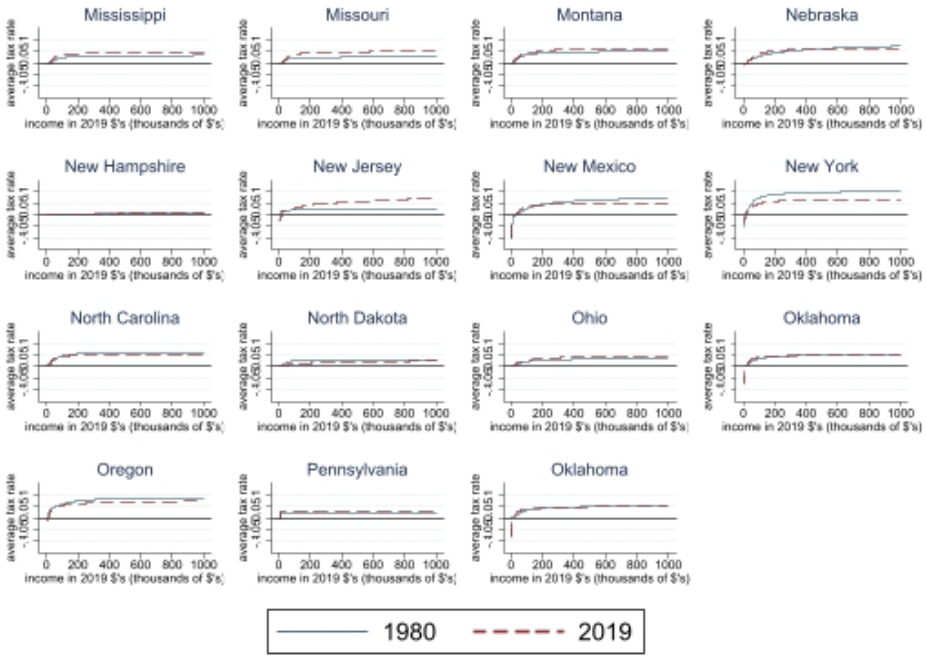
Wisconsin
average tax rate
income in 2019 $'s (thousands of $'s)
1980
2019

Figure A.4: State Tax Schedules for Married Households

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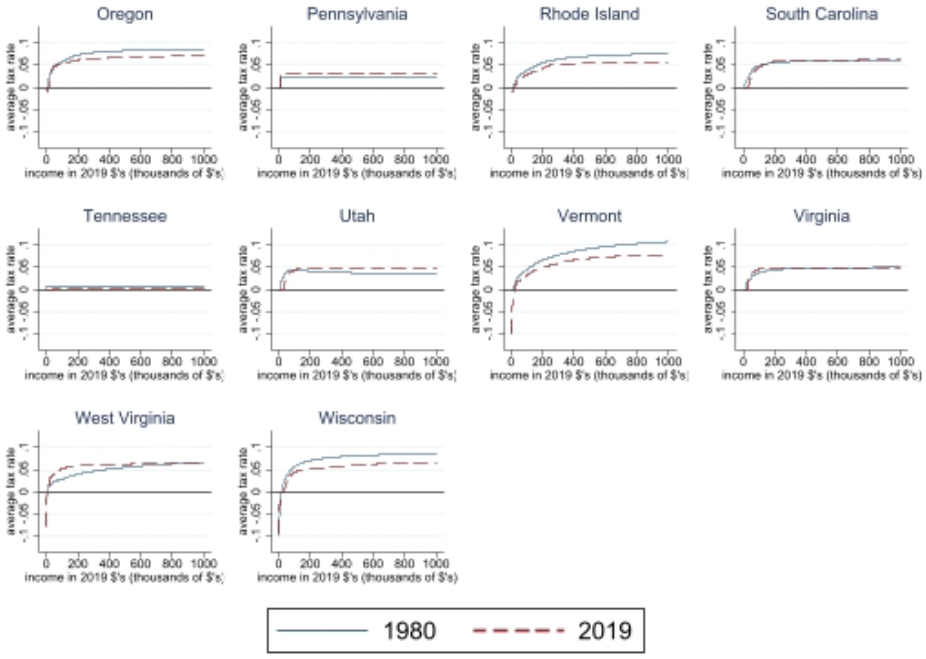
Oklahoma
average tax rate
income in 2019 $'s (thousands of $'s)
1980
2019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Vermont
Virginia
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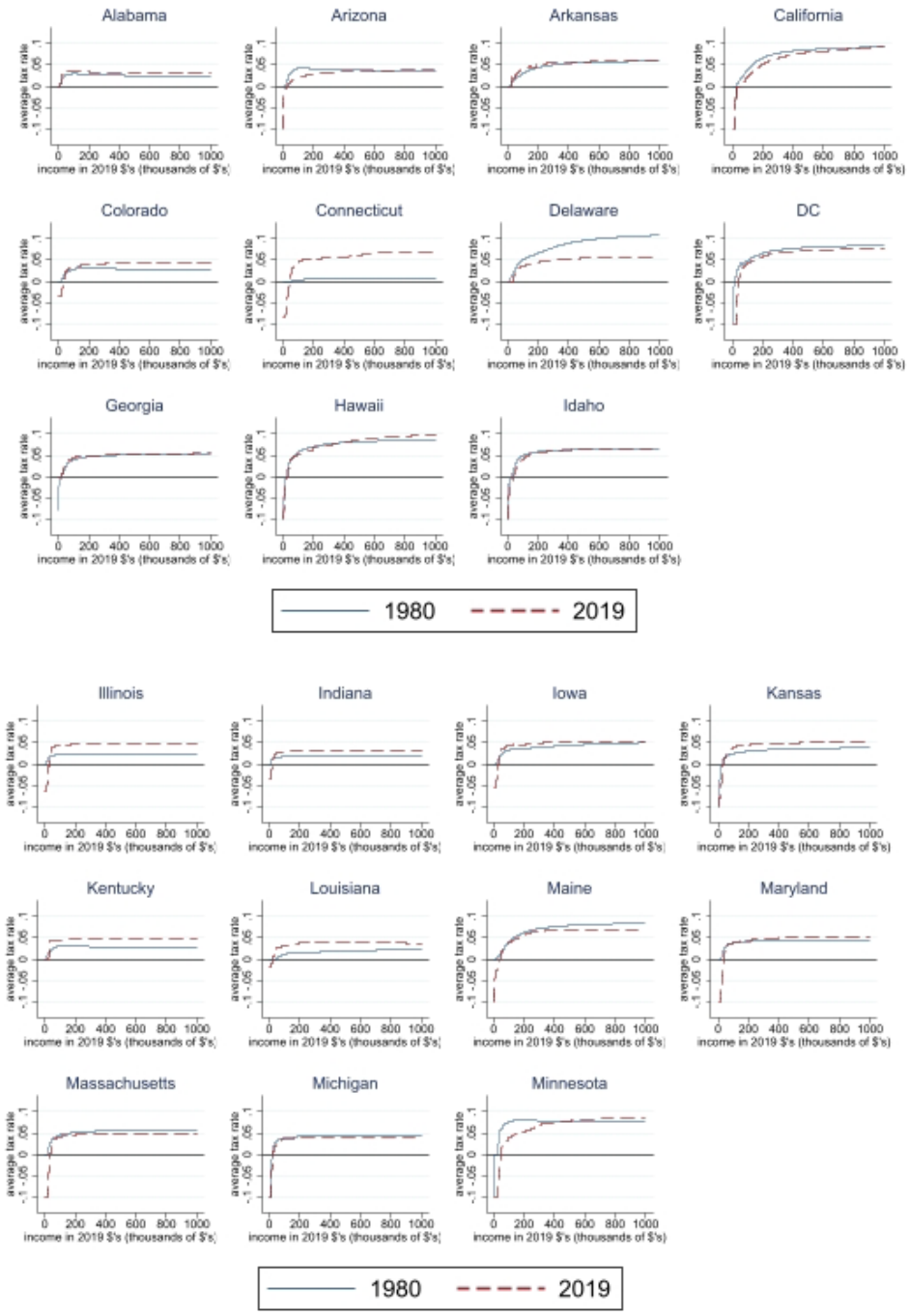
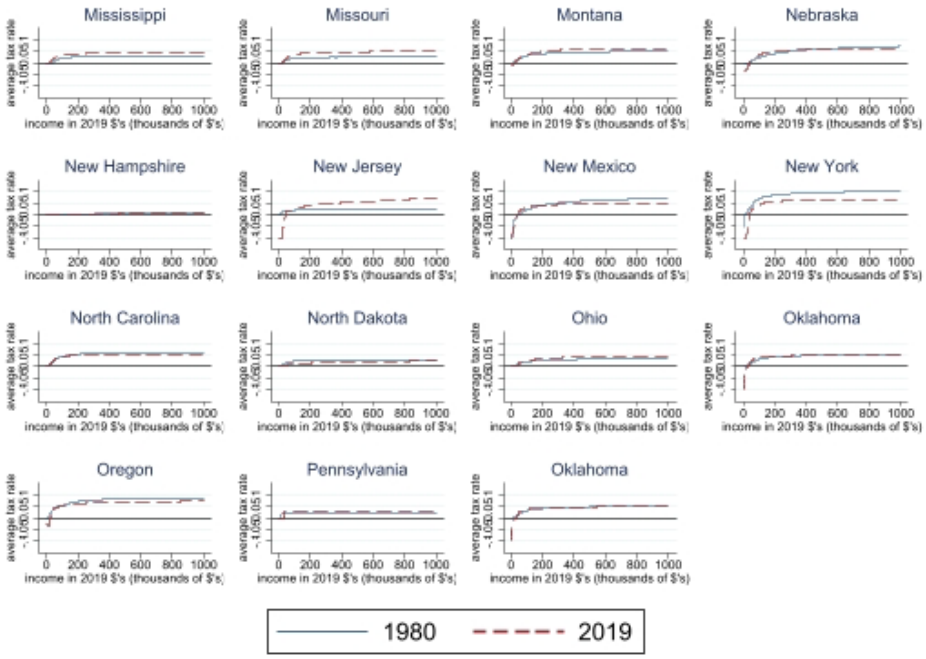
Wisconsin
average tax rate
income in 2019 $'s (thousands of $'s)
1980
2019

Figure A.5: State Tax Schedules for Married Households with Children

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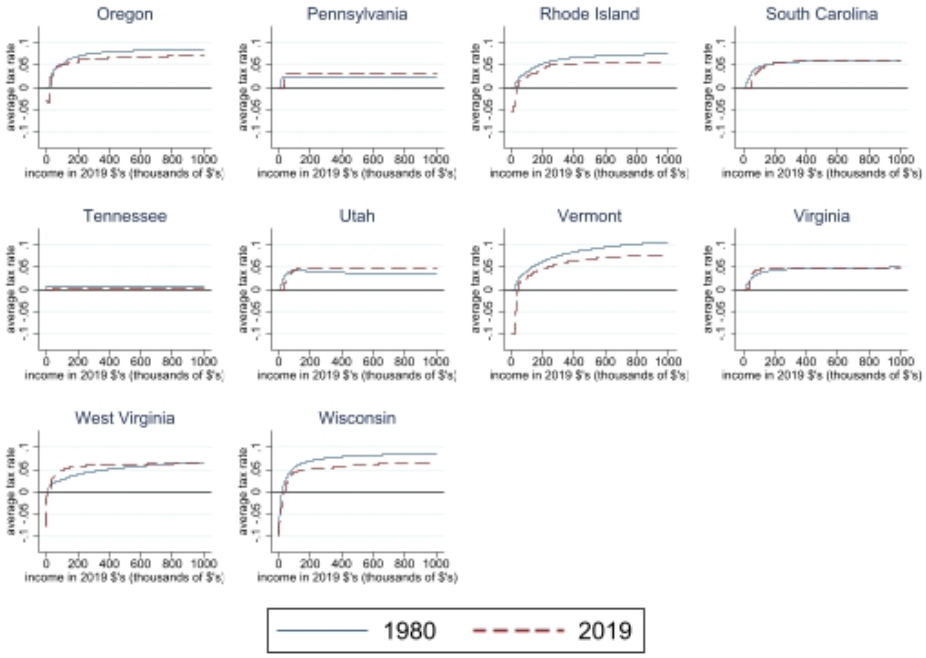
Oklahoma
Oregon
Pennsylvania
Oklahoma
average tax rate
income in 2019 $'s (thousands of $'s)
1980
2019


Oregon
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Tennessee
Utah
Vermont
Virginia
West Virginia
Wisconsin
average tax rate
income in 2019 $'s (thousands of $'s)
1980
2019