GROUP EQUITY AND IMPLICIT DISCRIMINATION IN TAX SYSTEMS

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I address some issues in measuring group equity and implicit discrimination and in assessing their role in the evaluation of tax systems, focusing on racial equity in the United States. I argue that group inequity should be judged relative to other accepted objectives of the tax system it may facilitate and stress the importance of having accurate measures of well-being. Finally, I present a decomposition of the difference in groups' average tax rates into measures of the overall progressivity, group differences in average income, and a set of income-group-specific measures of horizontal group tax differences.

I. MOTIVATION

Over the course of history, many governments have engaged in discrimination against disfavored groups according to race, religion, ethnic background, and gender and sexual orientation. At its worst, the discrimination was delivered in the form of the deprivation of basic human rights, deportation, enslavement, or genocide. Compared with the most horrific episodes, discrimination delivered through the tax system may seem trivial. Nevertheless, tax discrimination is worth studying and, where present, addressing.

The American experience with governmental implementation of racial discrimination is broad and deep, beginning with slavery, continuing in the form of Jim Crow laws, housing covenants, segregation of schools, and many other manifestations. Tax has played a supporting role. Following the abolition of slavery and the failures of Reconstruction, most Southern states made use of a poll tax as a way to deny voting rights to Black individuals. The administration of the poll taxes often betrayed their

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intent, as their statutory provisions commonly discouraged rather than encouraged collection. The effect of a poll tax was distributional as well as racial, as it effectively disenfranchised many poor White people. While the 24th Amendment, ratified in 1964, abolished the use of the poll tax (or any other tax) as a precondition for voting in federal elections, controversy continues in the United States over policies such as requiring a citizen to present a state identification card in order to vote. The historical connection between slavery and the tax system is deep. Einhorn (2006) argues persuasively that fundamental aspects of the pre–Civil War US federal tax system, such as its reliance on tariffs and excise taxes, were adopted and maintained so as to avoid having to confront the slavery issue in measuring representation in Congress.

All this history has contributed to the current state of the world and leads us to ask whether, and if so to what extent, the US tax system of today is racially biased. In this paper, I begin by addressing some issues in measuring group tax equity and implicit tax discrimination, relating them to the standard concepts that economists use to evaluate tax systems. I then suggest a set of interrelated measures of group equity in the tax system that can be insightful diagnostics for racial bias.

II. IMPLICIT DISCRIMINATION

A. Justifications for Implicit Discrimination

With very few exceptions, modern tax systems do not base tax liability on the group identity of the taxpayer, be that race, religion,[1] gender, or other characteristic — there is no *explicit* discrimination. But effective differentiation of tax burden by group membership can be achieved without explicit discrimination if tax liability depends on choices or circumstances that are characteristic of group members.[2] Modern taxes are not lump-sum, and, as such, choices drive tax liability. This is obvious in the case of excise taxes, where those who consume relatively more of a taxed good or service bear a higher burden, other things equal.[3] However, it is also true of income tax systems that typically contain scores of provisions that reward or penalize households based on their choices and circumstances.[4]

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[1] In the United States, individual income tax liability does not depend on one's religious beliefs or practices, but churches and religious organizations are generally exempt from income tax and receive other favorable treatment such as exclusion from gross income of the rental value of a home furnished to a "minister of the gospel" as part of compensation or the rental allowance paid as part of compensation (26 U.S. Code § 107).

[2] To be sure, many of the group differences in choices and especially characteristics exist because of past group discrimination. For example, differences in housing choices undoubtedly stem in part from redlining. In this paper, I mostly abstract from the historical determinants of the status quo but see, e.g., Gale (2021), who addresses how this matters for the evaluation of current policies.

[3] How much of a higher burden depends on the incidence of the tax.

[4] Moreover, it is even true for "clean" income and consumption taxes, because the relative burden will be higher for those whose tastes favor goods and services and lower for those who favor leisure, and because the relative lifetime burden under an income tax will be higher for those whose tastes favor

Discrimination can also result from the actions taken to administer and enforce the tax system by auditors and property value assessors and the algorithms they use to guide their choices. Such discrimination is implicit as long as the protocols for the procedures do not mention race, religion, or gender.[5]

Effective but not explicit discrimination is usefully called *implicit* discrimination.[6] The concept has been recognized by the US Supreme Court in *Bray v. Alexandria Women's Health Clinic*,[7] where the court argued that if some activities "happen to be engaged in exclusively or predominantly by a particular class of people, an intent to disfavor that class can readily be presumed"; the example mentioned was that "a tax on wearing yarmulkes is a tax on Jews."[8]

Implicit discrimination by a group arises whenever there is a correlation between tax-disfavored choices or circumstances and group identity; later I will address whether a measure of group equity should depend on this correlation conditional on a measure of well-being. In a complex tax system, it is inevitable that some groups are favored and some are disfavored. In what follows, I address the issues of implicit tax discrimination and group equity and discuss their connection to standard concepts of tax equity.

If someone were looking to effectively but implicitly discriminate against a group, the strategy would be to identify how the choices or characteristics of that group differed from the average and then find a way to penalize those choices or characteristics through the tax system. Supporters of these tax features might offer a range of principled justifications. Taxes on actions that have negative externalities can generate a more efficient amount of the action, even if the burden imposed varies with the personal predilection for the activity.[9] This argument has been invoked

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5   future consumption and lower for those who favor present consumption. This issue is usually ignored in empirical analyses of both vertical and horizontal equity.

5   Bearer-Friend (2022) discusses the conditions under which this can occur even though the tax agency does not inquire about race or ethnicity.

6   I am not at this point presuming that implicit discrimination is intended or even understood by the instigators of policy.

7   *Bray v. Alexandria Women's Health Clinic*, 506 U.S. 263 (1993).

8   But, see Eisenberg (1994, p. 180, fn. 191), who argued that "Actually, a tax on yarmulkes would be a tax on Jewish *men*, just as an impediment to obtaining abortion is an infringement on the rights of women. Justice Scalia failed to see the fallacy in his reasoning. Abortion is an activity unique to women even more than yarmulke-wearing is an activity unique to Jews (since a non-Jew has the ability to wear a yarmulke, but a man cannot obtain an abortion)."

    Very related issues occur in many nontax settings. For example, "disparate impact" is a judicial theory that allows challenges to employment or educational practices that are nondiscriminatory on their face but have a disproportionately negative effect on members of legally protected groups. This theory arose from the 1971 Supreme Court decision in *Griggs v. Duke Power Co.*, a case challenging a company's requirement that employees pass an intelligence test and obtain a high school diploma to transfer out of its lowest-paying department.

9   Also in principle, a Pigouvian tax could be accompanied by a rebate that approximately offsets its distributional consequences, as long as the amount of the rebate is not tied, person by person, to the extent the person engages in the activity. But this is hard to implement, although not impossible.

to justify taxes on, for example, cigarettes and alcohol, and to justify tax preferences for owner-occupied housing, although in all these cases the evidence is very controversial.[10] In some cases, the principled argument rests on the presence of internalities, defined as situations when people lacking self-control make decisions that are not in their own long-term interest. In the context of a model of addictive behavior, Gruber and Köszegi (2001) conclude that due to internalities, the efficient Pigouvian tax on cigarettes could amount to as much as $30 per pack of cigarettes, as much as 100 times the cost of externalities. Allcott, Lockwood, and Taubinsky (2019) argue that, in the presence of internalities, a tax can actually increase the well-being of those with a proclivity for this activity, using taxes on sugary drinks as their example.

Group discrimination could also be justified on efficiency grounds if groups display differential behavioral responsiveness to taxes; in this case, efficiency costs are reduced if marginal taxes are relatively low on the more responsive group. Boskin and Sheshinski (1983) use this logic to argue for higher marginal tax rates on the labor income of men compared with women, as on average the empirical evidence suggests that men supply labor more inelastically, so that taxing their income has less excess burden per dollar raised.

Another type of efficiency argument is that it is simply impractical, or too costly, to eliminate an inequity that is a byproduct of a valuable program. Kaplow (1992) offers the hypothetical example of when the only administratively feasible way to redistribute wealth from the rich to the poor is to omit some of the poor from receiving transfers, perhaps because some individuals live in remote areas.

These are examples where implicit discrimination is a side effect that arguably should be *tolerated* to achieve an efficiency gain. The theory of tagging, introduced by Akerlof (1978), suggests a more direct tradeoff between efficiency and discrimination. It holds that, for efficiency reasons, *any* observable, largely inelastic characteristic — including race, religion, and gender — across which the distribution of marketable abilities, and therefore well-being, differs ought to affect tax schedules. The logic is straightforward. By levying higher taxes based on characteristics more likely shared by high-income individuals, some progressivity is achieved, enabling the government to cut back on distorting (i.e., inefficient) policies such as rising average tax rates to achieve a given degree of progressivity. This is an efficiency argument for discrimination, implicit or explicit. But, as Weinzierl (2014) stresses, these measures are rarely used, which he suggests is consistent with actual policy being driven by a widespread disagreement with a purely utilitarian social objective in favor of some consideration of an equal-sacrifice criterion.

It is certainly a long way between acknowledging that there may be principled reasons for policies that implicitly discriminate against certain groups and saying

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[10] Gravelle and Zimmerman (1994) raise doubts about the social costs of secondhand smoke, and Glaeser and Shapiro (2003) are skeptical that owner-occupied housing provides substantial positive externalities.

that, in a particular case, these arguments outweigh the social costs of the discrimination. I will, though, argue below that these justifications should be acknowledged and, ideally, the benefits and costs of the policies should be quantified so they can be appropriately balanced.

I am not so naïve as to believe that all, most, or even a nontrivial fraction of implicit discrimination is an unintended and perhaps even unwanted side effect of an attempt to achieve legitimate objectives. Some features of the tax system undoubtedly exist because of the political power of the interests they serve, such as the housing lobby. More generally, to the extent that politicians favor the interests of certain races, religions, or genders, then on average these groups' interests will be favored whenever any tax feature — or any policy — is at issue. This may be conscious or unconscious bias on the part of legislators and other politicians. But it behooves us as economists to pursue the economic arguments that underlie evaluation of our tax system and proposals to reform it.

This set of issues overlaps somewhat with the issue of algorithmic bias, where algorithms designed to maximize predictive accuracy of some behavior may exhibit clear bias against some groups.[11] A literature has examined the costs of alleviating such bias in terms of predictive accuracy and other important objectives and notes that some other criteria must be invoked to choose among the algorithms that are on the efficient frontier. This literature notes that, in the big-data era, defining fairness by forbidding the use of certain information has become an infeasible approach because any outcome can be achieved, or nearly achieved, by making use of other, correlated, information. The key difference from the problem at hand is that predictive algorithms are designed explicitly to achieve some objective, while government policy, including tax policy, is rather the result of a complex political process involving both institutions and individuals — those involved in the institutions and voters. Any given individual may have a consistent objective function, but the political process does not have an explicit objective function although, as discussed below, one can be backward-engineered under some conditions and assumptions.

III. EQUITY IN TAXATION

A. Measuring Well-being: A Prerequisite for Assessing Equity

Assessments of equity generally require a measure of an individual's or household's level of well-being, so that the level of well-being can be compared across units and the impact of taxation on welfare can be measured. For practical reasons, the measure is typically based on some concept of annual income, although occasionally on a concept of permanent income or consumption. To the extent the measure of well-being is flawed, it may lead to mismeasuring concepts of equity. If it

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[11] See, e.g., Rambachan et al. (2020).

systematically overstates the well-being of some group, then the analysis will also systematically underestimate the net group bias.[12]

A relatively straightforward example is fringe benefits. A measure of well-being should include the value to the recipient of such benefits.[13] Or consider the matter of medical expenses: Is a better indicator of well-being (some measure of) income net of (some or all) medical expenses, or gross of medical expenses? If it is the latter, a deduction for medical expenses introduces horizontal inequity, defined later. If it is the former, not allowing such a deduction introduces horizontal inequity. A somewhat harder example involves owner-occupied housing. The Haig-Simons concept of economic income (consumption plus changes in net worth) would include the imputed rental value of the housing, as owning one's own dwelling saves that much in expenditure to finance a given level of housing services. The Joint Committee on Taxation (2012) uses in its distributional analyses a concept of "expanded income," which starts from adjusted income but then adds in several items, such as tax-exempt interest and the employer share of payroll tax. It does not, though, add in several other items that are part of Haig-Simons income[14] such as unrealized accrued capital gains, inflation corrections to capital income, and the rental value of owner-occupied housing and other durable goods.

A particularly difficult issue, and one highly relevant to the topic at hand, is family structure, both size and the division of family income among its members. Regarding family size, does a family of three with $40,000 of income have the same level of well-being, and therefore "ability to pay" taxes, as a family of nine with the same income, even though they obviously have different consumption needs? A standard approach for adjusting income as a measure of well-being for family size makes use of an equivalence scale, often constructed by calculating a measure equal to family income divided by family size raised to some exponential power less than one that reflects economies to scale in consumption.[15] A commonly used

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[12] Auerbach and Hassett (2002, p. 1123) put it nicely: "A central question that always arises in attempting to define horizontal equity is which adjustments are 'correct,' moving the tax burden closer to equitable, and which cause deviations from an equitable outcome. One could always do away with any measured horizontal inequity simply by assuming that any differences in burden between apparent equals are due to the fact that they really do differ in some respect that is being recognized by the tax system."

[13] In its concept of expanded income, the Joint Committee on Taxation (2012) includes the value of employer contributions for health plans, life insurance, and health flexible spending accounts (valued at cost). The Office of Tax Analysis (2021) includes some employer-provided fringe benefits (primarily health insurance) in its cash income measure.

[14] The Joint Committee on Taxation justifies not adding in these items on other than conceptual grounds, arguing that expanded income "capture[s] the most practically measurable elements of Haig-Simons income" (2012, p. 3).

[15] Hardy, Hokayem, and Ziliak (2022) use a different equivalence scale, dividing household income by 0.67 plus 0.33 if there is a spouse present, plus 0.2 times the number of children 13 or under, plus 0.33 times the number of children age 14 or older. The distributional figures I present later do not make any such adjustment.

power is 0.5, so comparable family income equals $Y / S^{0.5}$, or $Y / \sqrt{S}$, where Y is family income and S is family size.[16] This implies, for example, that a family of nine must have 50 percent more income than a family of four to be considered to have attained the same level of well-being, and a family of four must have twice the income of a family of one. This matters for distributional analyses. Cronin, DeFilippes, and Lin (2012) show that average tax rates for low-income families fall and average tax rates for some high-income families rise when the measured ability to pay is adjusted for family size in this way, because average family size increases with income, from 1.3 for the lowest cash income decile to 2.9 for the highest decile. Furthermore, for the earned income and child credit as of 2013, they show that measuring family well-being with this equivalence scale generates larger tax benefits as a percentage of income for the lowest income classes and smaller benefits as a percentage of income for middle-income families.

B. Vertical and Horizontal Tax Equity

Modern tax analysis holds that, other things equal, a tax system should comport with social standards of fairness, or equity, and distinguishes two kinds of equity — vertical and horizontal. Vertical equity concerns the appropriate tax burden on individuals, or households, who have different levels of well-being, where the conceptual issues that arise in measuring well-being have been discussed above.[17] Vertical equity is usually addressed by positing that the objective of policy is to maximize a social welfare function whose arguments are individuals' (or households') levels of well-being, or utility. In symbols, the social welfare function can be written as $W(U_1, U_2, ... U_i, ... U_N)$, where $\partial W / \partial U_i > 0$ for all i — that is, it is individualistic and satisfies the Pareto principle of always preferring an outcome where no one is worse off and at least one person is better off. The concavity of the social welfare function captures the society's degree of inequality aversion, implying that the marginal social welfare weights ($\partial W / \partial U_i$) are inversely related to the level of well-being. More progressive tax systems reduce inequality but do so generally at some cost of efficiency, due to the greater disincentives to earning income that more progressive tax systems inevitably impart. Thus, the appropriate degree of vertical equity, or progressivity,

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[16] Both the Office of Tax Analysis and the Joint Committee on Taxation use the equivalence scale discussed in the text. See Van de Ven, Hérault, and Azpitarte (2017), who use an inverse-optimum approach, described below, to identify equivalence scales that reflect the value judgments implicit in a tax-and-transfer system.

[17] This approach presumes that tax burden should be set following an "ability to pay" criterion, based on the plausible assumption that those with higher well-being have a higher ability to pay, or will suffer a smaller sacrifice for a given tax liability, compared with those with a higher level of well-being. An alternative criterion is the "benefit principle," in which tax burden is conceived as a quid pro quo for the utility received by taxpayers from government-provided services. As an example, in her paper on gender bias, Stotsky (1996) invokes the benefit principle when she suggests that differences in life expectancy could justify distinguishing between men and women in the tax code, such as applying gender-specific Social Security tax rates.

involves a tradeoff between the extent of inequality and the extent of efficiency cost, which depends both on the consequences of the disincentives and on the social value of equality. This approach is characterized as welfarist, because social welfare depends only on the outcomes of policies for individuals' well-being (i.e., their welfare), not on the process of reaching the outcomes. It is also anonymous (sometimes referred to as impartial), in the sense that the contribution of any person's well-being to social welfare does not depend on who that person is but only on his or her level of well-being: switching well-being between any two persons would not change social welfare.

The principle of horizontal equity holds that the tax burden should be the same among people, or households, of the same level of before-tax well-being. No tax system meets this principle exactly, but the spirit of horizontal equity suggests that, other things equal, a tax system is better the less horizontal inequity there is. To assess this, there have been a few attempts to measure the extent of violation of horizontal equity, sometimes called the degree of horizontal inequity. Notably, King (1983) relies on the extent to which a tax system reranks households, while Auerbach and Hassett (2002) construct a social welfare function that distinguishes between inequality aversion within income groups and inequality aversion across income groups.

Any such attempt runs into three challenges. First, as discussed above, how does one measure equals — is it equal income, utility, or something else? Second, it has been shown by Kaplow and Shavell (2001) that valuing the extent of horizontal inequity per se conflicts with a welfarist framework (i.e., it generally violates the Pareto principle[18]). Both the King (1983) and Auerbach and Hassett (2002) measures do that by implicitly according special welfare status to the status quo, either by according negative welfare to rerankings relative to the status quo or defining horizontally relevant classes by their well-being under the status quo. Kaplow (1989, 1992, 2000) argues that many concerns of horizontal equity are well handled by a concave social welfare function without any need to measure horizontal inequity per se and reduce to an injunction against what personal characteristics should not determine tax liability. Third, how does one balance any violation of horizontal equity against the other desirable outcomes that its violation might enable, such as efficiency?

C. Group Tax Equity

In this section, I develop a set of interrelated measures for understanding the magnitude and nature of group inequity that are associated with the public finance literature's standard concepts of horizontal and vertical equity.

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[18] Although this need not be true if individuals' utility depends on their level of well-being relative to some reference group; in this case a policy that raises their income could lower their utility if it delivers an even greater increase in well-being of the reference group.

What aspects of a tax system would indicate that it discriminated against a certain group? By analogy to horizontal equity, one might posit a principle of group equity as holding that the average tax burden should be the same across groups of people, such as racial or gender groups, and consider measuring group inequity by how far a tax system diverges from that standard. I will refer to this as the group average tax rate differential, or GATRD.

The GATRD depends on both vertical and horizontal aspects of a tax system.[19] It depends on vertical aspects because if one group is more heavily represented in the lower-income groups, that is, it has lower average income, then the more progressive the tax system is, the lower will be that group's GATRD. Any tax system reform that increases progressivity will improve the relative tax position of the lower-income group. Indeed, requiring that a group with lower-than-average income have the same average tax liability as a group with higher-than-average income would require a regressive tax system with average tax rates declining with income, a violation of most everyone's notion of vertical equity. Therefore, GATRD depends on the system's average progressivity, or AP.

The GATRD also depends on horizontal aspects of a tax system, that is how, within well-being classes, the average tax rate differs by group. Consider the following construct. Let Y_i be the measure of well-being of the ith individual or household, perhaps some measure of income adjusted for the issues discussed above and certainly not, except by coincidence, any tax system's measure of taxable income. Denote tax liability (and, by assumption, tax burden[20]) of the ith individual or household as $T_i = T(Y_i, c_i)$, where c_i is a vector of choices and characteristics that may affect tax liability. Now assume there are two groups, call them A and B, and denote group membership by μ_A or μ_B, each equal to one or zero for any individual. At any Y (or, practically, within a small band of Y), calculate the average tax liability of members of group A and B. Because the choices and characteristics c_i may vary systematically by group, so may tax liability vary by group for given Y. I define the horizontal group inequity (HGE) as the difference in average tax rate between members of group A and B at income level Y (HGEY, where Y can be H or L) as $T(Y, \mu_A)/Y - T(Y, \mu_B)/Y$. Note that this is not a single-valued measure of horizontal group equity, and in general, it varies across levels of well-being and could even change sign as income varies. This is similar to calculating, for each group, what the counterfactual tax liability would be if a group instead had the average tax-relevant choices and characteristics of the other group at that level of Y, and calculating the implied difference in average tax liability. Note that HGE measures do not rely on rerankings, nor do they otherwise accord special status to the status quo distribution of well-being; instead, they compare the average tax liability of two groups, neither of which is given special status.

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[19] Moran and Whitford (1996) make the point that both horizontal and vertical aspects of the tax system matter for assessing racial equity and address many of the issues I discuss below.

[20] That is, I am abstracting from issues of tax incidence.

In an appendix, I show in a two-income-class example exactly how GATRD is related to AP, the distribution of groups by income, and income-specific HGE measures. In a multi-income-group world, the precise relationship is more complicated, but the insights remain: the average tax differential between two groups depends both on their relative income levels and how that interacts with the system's overall progressivity and the within-income-group difference in group tax liabilities. The same insights apply to tax reforms.

I offer these measures in the hope of clarifying aspects of the tax system that are potentially relevant to welfare, such as racial discrimination. As Kaplow (2000, p. 3) writes, "Identifying instances of apparent unequal treatment of equals may aid the analyst in diagnosing various defects in the tax system." In addition, changes in tax progressivity that do not differentiate among groups of equal income have implications for the relative tax burden of different groups with different average income.

D. Nonanonymous Social Welfare Functions and the Implicit Group Welfare Discount/Increment

A government maximizing an anonymous social welfare function could implement a set of policies that violated horizontal group equity but would do so only coincidentally if, for example, a group happened to make decisions with above-average negative externalities and corrective taxes could not offset the pattern of burdens imposed. Alternatively, a political process motivated either by group animus or political calculation could proceed as if to maximize a nonanonymous social objective function, where the nonanonymity is based on group membership, so that the objective can be expressed as $W(f(\mu_1)U_1, f(\mu_2)U_2, ... f(\mu_i)U_i, ... f(\mu_N)U_N)$. In this expression, $f(\mu_i)$ represents the discount (or premium if $f > 1$) applied to the utility of members of group i. The discount need not be a constant depending only on group membership but could also depend, for example, on the income level, such that poor members of a group have a greater discount than rich members do.

What if a society is both somewhat inequality-averse and also effectively averse to some groups? What social welfare discount on the discriminated-against group's well-being would be consistent with a society's observed degree of tax progressivity and its observed systematic group bias (and behavioral response parameters)? Estimating the implied discount requires that there be at least one policy that effectively discriminates by group within income classes. Without this, there is no way to tell, for example, if a policy that is biased against a group with lower-than-average income is a result of (a lack of) inequality aversion or is a result of group bias.[21] For a given degree of inequality aversion, the group bias would decrease the extent of tax progressivity, because progressivity unavoidably helps this group's members.

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[21]   For example, for a decision maker with group animus, the ability to horizontally discriminate may be a precondition for a progressive (for the favored group) policy.

Note that a comprehensive analysis of this kind would take seriously that principled reasons for horizontally differentiating policy, such as externalities and internalities, might exist. From this perspective, the observed extent of progressivity depends not only on society's inequality aversion but also on its group bias and the favored and disfavored groups' placement in the income distribution. Variation in progressivity across jurisdictions would depend on variation in effective group bias.

Some research, going back at least to Mera (1969) and more recently to Kopczuk, Slemrod, and Yitzhaki (2005); Bourguignon and Spadaro (2012); and Lockwood and Weinzierl (2016), has attempted a very similar exercise, sometimes called an "inverse-optimum" approach. It uses analytical results from optimal tax theory and assumptions on economic parameters to infer the marginal social welfare weights that govern policy choices. These are the weights that would give rise to the observed tax system if a policy maker or policy process embracing these weights and assuming a set of behavioral response elasticities had selected a tax schedule. Usually, the approach seeks to infer how the marginal social welfare weights vary by level of well-being and thus estimates the implicit social aversion to inequality. But one could extend this exercise by estimating the combination of inequality aversion and group discount that would yield the extent of observed progressivity and effective discrimination. Kopczuk, Slemrod, and Yitzhaki (2005) perform such an exercise, calculating what the observed level of foreign aid implies about the implicit relative welfare weight placed on domestic versus foreign residents, concluding that it is consistent with US policy on average valuing the well-being of foreigners only 1/6 as much as an American citizen, and less than 1/2000 as much for the residents of the poorest of the developing economies.

This kind of exercise is backward-looking, but it can be forward-looking as well. Imagine that the United States decided to redress past group bias.[22] This suggests, as an exercise, evaluating current and proposed policies with a social welfare function that has a group-specific marginal social welfare *increment* for groups historically discriminated against. This framing seems better than adding an argument to the social welfare function equal to the relative average income of historically disadvantaged group members relative to nonmembers, which would potentially favor policies that violate the Pareto principle. But it is certainly a very reductivist exercise, because any effective increment in the marginal social welfare weight is a crude stand-in for the objective of a society that values undoing past transgressions and their effects.

Intuitively, either a group increment or discount would exacerbate horizontal inequity, as two people with the same income or well-being would get different social

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[22] The case for and against a program of reparations for Black Americans raises many important and difficult issues and is beyond the scope of this essay. See Darity and Mullen (2020) for a comprehensive treatment of the case for reparations.

welfare weights, inviting optimal policy to favor or disfavor them. Following the logic of Kaplow (1989, 2000), the social cost of this would be reflected in social welfare depending on the concavity of the social welfare function and the group discount/increment function.

IV. EMPIRICAL STUDIES OF GROUP BIAS

A. Some Issues in Gender Bias in Taxation

In what follows, I look more closely at one important example of group bias — racial bias in the United States — applying the insights of the previous sections.[23] However, before turning to that issue, I briefly address gender bias.[24] Legal scholars such as Blumberg (1971), Alstott (1996), Moran and Whitford (1996), and Mc-Caffery (1997) have contributed insightful discussions, focusing on the implications of joint versus individual filing and the tax treatment of household work, among other issues. Important contributions from economists include those of Stotsky (1996, 1997) and Grown (2005, 2010).

The issue of individual versus joint income taxation raises important efficiency and equity issues related to gender bias. Regarding efficiency, under joint taxation the marginal tax rate of each worker in a household depends on the total income of the family; thus, a secondary worker — often the woman[25] — may face a strong disincentive to enter the labor force and to earn taxable income. The nontaxation of household work provides an inefficient incentive for that activity versus market work, putting aside any positive externality that might be associated with child rearing.

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[23] I put aside the nontrivial issues of what data allow this type of analysis. Tax administration data, now available in deidentified form to researchers on a limited basis, do not indicate the race of the taxpayer and have very little demographic information of any kind; these data can be merged with Social Security Administration data to get some demographics. Indeed, the Internal Revenue Service (IRS) and Treasury Department have resolutely resisted allowing researchers to link/merge tax data with other demographics-rich data.

One could use a method such as Bayesian Improved Surname First Name Geocoding (BISFG), as explained and implemented by Fremont et al. (2016) or Voicu (2018), to predict race or impute race based on the racial composition of the taxpayer's neighborhood. Two methodological challenges are how to address mixed-race families, and how to address income tax nonfilers, which are disproportionately Black households. The main household surveys, such as the Current Population Survey, Survey of Income and Program Participation, American Community Survey, and the Panel Study of Income Dynamics, all have good data on race and other demographics, but they do not have detailed tax-relevant information, although some of these variables can be (imperfectly) imputed.

[24] For gender, a big issue is that most — but not all — two-adult families have one adult of each gender. A similar issue arises for mixed-race families. In addition, tracing the effect of tax policy to the well-being of each adult, as well as to the children, must address who controls the family expenditure patterns.

[25] What makes someone the secondary worker is often not precisely defined, so the statement that women are often secondary is also not precisely defined. If it means lower-earning, that is still true, on average, although not as true as it once was.

The equity issues concern how to compare well-being across households that vary by the number of adults, their marital status, the division of earnings between the household members, and the number of children in the household. Lurking in the background is a well-known impossibility theorem: no progressive tax system with graduated rates can simultaneously be neutral between single and married households with the same income and be neutral among married households with a different division of earnings. In the US income tax system, which shifted from individual to joint filing in 1948, the resolution of these tradeoffs plays out in the creation of marriage penalties and bonuses. The policy instruments are the separate tax rate schedules that apply to households of different marital status and also the level and form of dependent exemption allowances, child-related credits, and such. Couples in which one adult earns most or all of the family's income are less likely to face marriage penalties, and almost always now receive a marriage bonus. Because, as I discuss below, there are racial differences in family structure even at a given income, these tax features also have implications for racial equity. How this set of tax features causes gender bias is not, however, straightforward.

Caren Grown and collaborators have sought to quantitatively assess the extent of gender bias in tax systems around the world. Barnett and Grown (2004) and Grown (2010) note four aspects of gender differences in economic activity that may affect gender equity in taxation: women (1) are more likely to enter and exit the labor force; (2) are more likely to work in the informal economy; (3) are more likely to do unpaid (and untaxed) care work; and (4) have different consumption patterns. Regarding indirect taxes, Stotsky (1996) notes that, due to distinct consumption patterns, taxes on alcohol and tobacco are likely to burden women less, while taxes on medical services are likely to burden women more. In recent years, the excise tax status of feminine hygiene products has become a contentious issue, and several countries and US states have changed their policies to ensure that these products receive the same preferential tax status as other "necessity" goods (i.e., with a low-income elasticity) such as food.

B. Some Studies of Racial Bias in Taxation

I turn now to racial equity, and in particular whether Black households face a discriminatory tax penalty. Many scholars, with Brown (2021) a notable recent example, claim that several aspects of the US income tax system do just that as a result of the way, for example, it treats housing, family structure, and labor versus capital income.

It is well known that the US income tax system (federal and state) provides a substantial tax preference to owner-occupied housing, relative to rental housing and most other kinds of capital. The preference stems from the exemption from the tax base of the rental value of that housing, while at the same time allowing a (limited) deduction for mortgage interest and property tax payments. Poterba and Sinai

(2008) document how the value of these tax preferences increases sharply with income. According to the Current Population Survey, there is a large disparity in the homeownership rate between White and Black households — as of the second quarter of 2021, it is 74.2 percent for non-Hispanic White households and 44.6 percent for Black households. But the homeownership rate is also strongly related to income, in the same period being 78.9 percent for households with above-median income and 51.9 percent for households with below-median income.[26]

Is this a case where it is the tax feature's regressivity, with benefits disproportionately accruing to higher-income households, that on average disfavors relatively low-income Black households as well as low-income White households? Apparently not, as homeownership rates are much higher for White families compared with Black families even within broad income categories, according to data from the Current Population Survey. These data patterns suggest that redirecting some of the tax preference away from owner-occupied housing toward rental housing would be both progressive and would reduce the group tax inequity imposed on Black families.

Black joint filers are more likely to have two earners, and a more equal split of income, and this is true within income groups (except in the lowest quintile regarding the number of earners). Nontaxation of imputed income from household work thus benefits White families relatively more. In addition, the fraction of adults married is substantially higher among Whites compared to Blacks, 58 percent versus 37 percent, and there is a substantial gap among all income groups.[27]

Another set of concerns raised by Brown (2021) is that, on average, Black households do not save as much and have less wealth for given income, and so do not benefit from capital income tax preferences. In addition, they are especially unlikely to invest in stocks and are not as widely covered by pension plans and, if covered, more likely to withdraw early and be subject to withdrawal penalties. It is true that, overall and within income classes, White families have substantially more investment income (dividends, capital gains, interest, and rental income) than do Black families and contribute more to retirement accounts. At given income levels, Blacks are at least as likely as Whites to be covered by pension or other retirement plans, but overall are not as likely because plan membership increases with income.[28] But note that tax preferences given to capital income are highly regressive, given the skewness of the wealth distribution.

Excise taxes can be a source of implicit discrimination if consumption of relatively highly taxed goods varies by group. The likely suspects in the United States are alcohol, tobacco, and (implicitly) legal gambling. All are also known to have a relatively low-income elasticity and so burden Black households relatively more

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[26]   See Tables 16 and 17 at https://www.census.gov/housing/hvs/data/histtabs.html.
[27]   Source: Current Population Survey, 2019.
[28]   Source: Current Population Survey, 2019.

for that reason. But, for given income, Black individuals are less likely to be everyday smokers and spend less on cigarettes and spend substantially less on alcohol.[29]

This *National Tax Journal* Forum features three careful studies of racial bias in taxation. In what follows, I briefly discuss each in the context of the framework I've laid out above.

1. The Child Tax Credit

Goldin and Michelmore (2022) document what they refer to as "disparities by . . . race" in the US Child Tax Credit (CTC) as of March 2018.[30] For example, three-quarters of White and Asian children who do qualify are eligible for the full CTC benefit, but only about half of Black and Hispanic children are. Of those children who do qualify, more than three-quarters fail the earnings test, which states that the refundable portion of the credit is limited to 15 percent of the amount by which the taxpayer's earned income exceeds $2,500.[31] Because Black households are more likely to have earned income below the $2,500 threshold, children in these households are more likely to be ineligible for a refundable CTC, in part because Black children are less likely to live with their fathers. What the paper does not establish is whether, within an income group, Black households are more likely to have ineligible children. This would depend on the CTC's other eligibility criteria.

The paper does not address the principled reasons for the CTC's design features. Upon its introduction (as part of the Taxpayer Relief Act of 1997), it was defended by saying that the personal exemptions for dependents did not "reduce tax liability by enough to reflect a family's reduced ability to pay taxes as family size increases" (Joint Committee on Taxation, 1997, p. 6). This is an argument that taxable income fails to reflect how well-being varies with family size. According to the Current Population Survey, as of 2019 Black families on average have more children living at home than White families, overall and within income classes, reflecting largely the fact that White families are more likely to have no children living at home. This does not, however, justify the earned-income-based limit. That would have to rest on the same kind of argument that supported "workfare" over "welfare" — that it reduces the tax disincentive to work by effectively providing a subsidy of 15 percent for earned income above the $2,500 threshold until the maximum refundable amount is reached. A CTC schedule with no earned income limit would provide no

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[29] The claim about everyday cigarette smoking comes from the May 2019 Tobacco Use Supplement Survey of the CPS, and the claims about spending on cigarettes and alcohol are based on quarterly interview data from the 2019 Consumer Expenditure Survey.

[30] The authors also examine the overall distribution of the CTC by income group and find it to be starkly regressive — 87 percent of those in the bottom decile of the national adjusted gross income (AGI) distribution are completely ineligible for the CTC, while in the top half of the AGI distribution, virtually all children are eligible for the full credit.

[31] The temporary change in the CTC for 2021 removes these limitations and, as a result, increases the amount of the credit for taxpayers with low and moderate incomes.

subsidy to earning income, with the tradeoff of providing a more progressive refundable CTC distribution. This is the classic tradeoff in delivering progressivity: a more progressive tax-and-benefit schedule requires on average higher marginal tax rates (or, in this case, less subsidy) and therefore more disincentive to earn income.

2. The Earned Income Tax Credit

Like the CTC, the Earned Income Tax Credit (EITC) is targeted toward low-income families, so its progressivity makes it likely that it disproportionately benefits Black families. Two other features matter. First, because it is proportional to earned income at the lowest income levels, it does not benefit the poorest of the poor as much as, say, a flat credit would. This raises the incentive-progressivity tradeoff discussed above for the CTC. Second, for given income (and like the CTC), the amount of the credit increases with the number of children in the household. In 2020, the maximum tax credit ranges from $3,584 for those with one child to $6,660 for those with three children. Taxpayers who might qualify for the EITC can face large marriage penalties if one spouse's income disqualifies the couple. However, marriage can increase the EITC if a nonworking parent files jointly with a low-earning worker.

Hardy, Hokayem, and Ziliak (2022) assess the relationship between the EITC and Black-White income inequality. Their focus on income rather than tax liability (or, in this case, tax credit) distinguishes it from the framework I have laid out. In particular, to the extent that the EITC encourages more work, they will count this as an increase in income and implicitly in well-being, not netting the income gain against the utility loss from the reduction in leisure. In a sense, though, the focus on income addresses my suggestion that evaluation of group equity and implicit discrimination take account of the principled justifications for policy design; by allowing for labor supply response, their approach gives some positive recognition of tax systems that provide more incentive to earn income.

To assess how the EITC has affected income inequality overall, Hardy, Hokayem, and Ziliak (2022) compare the 1980–2020 time series of the ratio of within-Black and within-White inequality measures, with and without the EITC.[32] The authors conclude that the EITC reduced Black-White inequality, but not at the lowest income levels, consistent with its work-based nature not providing income support for the poorest of the poor. They investigate some of the sources of group differences in the impact of the EITC. For example, the average number of EITC-qualifying children was higher for Black families than for White families, but the difference gradually declined until it disappeared around 2014; this calculation is not done within given income classes, however.

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[32] Because they compare within-group income percentiles, they are not comparing the income of Black and White families at the same level of income.

The enforcement of the EITC potentially raises group equity issues. While the overall audit rate is generally increasing with income, it is about the same for EITC recipients, who are at the bottom of the income distribution, as it is for the top 1 percent of income earners (1.41 percent versus 1.56 percent in 2019[33]). According to Bloomquist (2019), largely because of the IRS's enforcement focus on the EITC, audit rates tend to be highest in low-income, predominantly Black communities; strikingly, the 10 counties in the country with the highest audit rates were all predominantly Black. Whether Blacks are more likely to be targeted for audit among low-income EITC filers has not yet been demonstrated.

These two Forum papers shed light on how apparently race-blind aspects of tax policy can affect Black and White families differentially. The CTC and EITC raise many similar issues, first in terms of their contribution to the overall progressivity of the tax system.[34] Both programs are restricted to taxpayers below a certain income level, so they are at least somewhat progressive, but the caps are at very different levels. The pre-2021 CTC begins to be phased out for married taxpayers with AGI above $400,000, but for the EITC the maximum AGI to receive any credit in tax year 2021 is $57,414 for taxpayers filing jointly with three or more qualifying children, and less for other filing types and less-claimed children. So, in terms of average progressivity, the EITC is much more progressive and so will benefit Black families relatively more because they have lower average income. However, both programs restrict the benefits offered to the poorest of the poor, and so the progressivity does not well target the lowest income class where Black families are especially predominant. The papers in this Forum also provide evidence of what in this paper I have labeled horizontal group tax inequity, in that due to differing average characteristics, Black families receive fewer monetary benefits at a given level of well-being, measured by income or family-size-equivalized income.[35] The total effect on racial equity of a tax feature, or a change in tax feature, depends on its implications for average progressivity and for horizontal group equity, interacted with the divergence in the groups' distribution of income.

3. Property Tax Assessment

Overall, property taxation is probably progressive, so the average burden on Black households is lower than on White households. But its administration and

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[33] These figures come from Kiel (2019).

[34] Recall that I've ignored the ultimate incidence of these programs. But others haven't. See, e.g., Rodgers (2018), who estimates the extent to which the CTC induces the before-subsidy price of child care to rise; and Leigh (2010), who measures how much the EITC depresses the presubsidy wages of low-skilled workers.

[35] However, as I note above, the Hardy, Hokayem, and Ziliak (2022) paper compares Black and White families at the same percentile of their group's income distribution, rather than at the same level of income.

enforcement could have racial equity implications, and several studies document bias against Black families (see, e.g., Kahrl [2018]).

Avenancio-Leon and Howard (2019) demonstrate that the average assessment ratio for a Black resident in their sample is 12.7 percent higher than for a White resident. This is not a byproduct of racial wealth differences and the previously documented propensity for assessment ratios to be regressive (Paglin and Fogarty, 1972; Sirmans, Gatzlaff, and Macpherson, 2008; Weber and McMillen, 2010; McMillen and Singh, 2020). If assessment models were to somehow generate price-regressive assessment ratios in a way entirely unrelated to race or ethnicity, this regressivity — combined with racial wealth gaps and a correlation between wealth and home value — would mechanically induce racial inequality in property taxes. The authors show that about half of this differential reflects across-neighborhood differences in market value not captured by assessments, and about half arises within neighborhoods — an average minority homeowner has an assessment 5–6 percent higher relative to market price than her nonminority neighbor does. This occurs even though most assessors do not observe individual homeowners' race and the authors ascribe some of it to minority homeowners being less successful in appeals (not conditional on house value). They find no evidence that assessors exercise overt racial animus. "Insufficient responsiveness to neighborhood features is what generates spatial inequality in assessments, but the fact that minorities live in neighborhoods with different average characteristics is what causes inequality to land along racial and ethnic lines" (p. 23). Avenancio-León and Howard (2022) find that property tax caps restricting the growth of tax assessments reduce the difference in average assessment ratios for Black and White homeowners they documented in their earlier paper. This occurs for two reasons. First, in neighborhoods with home price growth in excess of the statutory cap, Black homeowners have higher-than-average home price growth and so benefit relatively more from the cap. Second, and relatively more important, the caps effectively discipline the assessor errors that are the main cause of the average assessment ratio disparities because, the authors speculate, the cap removes the assessors' reliance on complicated (and implicitly discriminating) valuation methods.

I cannot conceive of any efficiency reason for these biases other than that "it cost money to get it right," which is not very compelling. To the extent that the bias is vertically regressive, it arguably decreases the disincentive cost of effecting progressivity, but it is hard to see how this is an efficient way to achieve that objective.

V. CONCLUSIONS

Given the pervasive racial discrimination in US history and across a wide range of current government policies, it would be surprising, perhaps even shocking, if the tax system was devoid of racial discrimination. The papers in this Forum are examples of careful attempts to document the extent and nature of such bias and are part of a recent wave of similar studies. They alert us to the real possibility that key

elements of the US tax system may implicitly discriminate against Black families. The analysis of group equity has not received enough attention within the public finance community, and this Forum is a step toward addressing that state of affairs. In this paper, I have offered some thoughts as to how the issue can be integrated with the existing constructs economists use to measure and evaluate equity in taxation, with the goal of clarifying how a tax system, or reform, affects the volume and nature of group bias.

I emphasize three issues. First, group equity should be judged relative to other accepted objectives of the tax system, such as correcting the inefficiency consequences of externalities or the administrative cost of achieving universal delivery of transfer programs. Group inequity can be part of an optimal tax system if it facilitates achieving these objectives and no superior method is feasible, but the social value of these objectives should be made explicit.

Second, evaluations of both vertical and horizontal equity rely on having measures of well-being, generally based on some concept of annual income and occasionally on a concept of permanent income or consumption. If the measure of well-being systematically overstates well-being of some group, then the analysis will also systematically underestimate the net group bias.

Finally, and in my view most important, I recommend that such studies distinguish to what extent measured bias reflects (changes in) the progressivity of the overall tax system or tax system feature being studied. Because Black households have lower-than-average income, they will on average be relatively hurt by reductions in the progressivity of the tax system and relatively helped by increases in progressivity. But changes in progressivity, appropriately defined, will have the same impact on families of a given income regardless of their race. I offer a decomposition of the difference in groups' average tax rates — and the effect of reforms on this measure — into measures of (changes in) the overall progressivity, group differences in average income, and a set of income-group-specific measures of horizontal group differences, and suggest that this decomposition can sharpen the diagnosis of racial equity in the tax system.

APPENDIX

Consider two income/well-being classes, $Y = L$ or H, and two groups, $G = A$ or B, with respect to which we are trying to assess implicit tax discrimination. Let n_{GY} be the number of people who are in group G and income/well-being class Y, while n_Y and n_G are defined as the number of people in income/well-being class Y and group G, respectively. T_{GY} is the tax burden on a member of that class/group, and Y_{GY} is the income of that member.

In a two-group, two-income example, the key expressions for group average tax rate differential (GATRD), average progressivity (AP), and horizontal group equity at income Y (HGEY) are defined as:

$$GATRD \equiv \frac{1}{n_A}\left(n_{AH} \times \frac{T_{AH}}{Y_H} + n_{AL} \times \frac{T_{AL}}{Y_L}\right) - \frac{1}{n_B}\left(n_{BH} \times \frac{T_{BH}}{Y_H} + n_{BL} \times \frac{T_{BL}}{Y_L}\right)$$

$$AP \equiv \left\{\frac{n_{AH}}{n_H} \times \frac{T_{AH}}{Y_H} + \frac{n_{BH}}{n_H} \times \frac{T_{BH}}{Y_H}\right\} - \left\{\frac{n_{AL}}{n_L} \times \frac{T_{AL}}{Y_L} + \frac{n_{BL}}{n_L} \times \frac{T_{BL}}{Y_L}\right\}$$

$$HGEL \equiv \frac{T_{AL}}{Y_L} - \frac{T_{BL}}{Y_L}$$

$$HGEH \equiv \frac{T_{AH}}{Y_H} - \frac{T_{BH}}{Y_H}$$

Substituting $n_{AH} = n_H - n_{BH}$ and $n_{AL} = n_L - n_{BL}$ into the expression for AP and using the definitions of horizontal group equity of low-income households (HGEL) and horizontal group equity of high-income households (HGEH) yields:

$$AP = \frac{T_{AH}}{Y_H} - \frac{n_{BH}}{n_H}HGEH - \left\{\frac{T_{AL}}{Y_L} - \frac{n_{BL}}{n_L}HGEL\right\}$$

Substituting $n_{AH} = n_A - n_{AL}$ and $n_{BH} = n_B - n_{BL}$ into the expression for GATRD yields:

$$GATRD = HGEH - \frac{n_{AL}}{n_A}\left(\frac{T_{AH}}{Y_H} - \frac{T_{AL}}{Y_L}\right) + \frac{n_{BL}}{n_B}\left(\frac{T_{BH}}{Y_H} - \frac{T_{BL}}{Y_L}\right)$$

Combining these two expressions and rearranging yields:

$$GATRD = \left(\frac{n_{BL}}{n_B} - \frac{n_{AL}}{n_A}\right)AP + \left(1 - \frac{n_{AL}}{n_A} \times \frac{n_{BH}}{n_H} - \frac{n_{BL}}{n_B} \times \frac{n_{AH}}{n_H}\right)HGEH$$

$$+ \left(\frac{n_{AL}}{n_A} \times \frac{n_{BL}}{n_L} + \frac{n_{BL}}{n_B} \times \frac{n_{AL}}{n_L}\right)HGEL$$

$$GATRD = X^*AP + Y^*HGEH + Z^*HGEL$$

Each of the terms in parentheses, denoted X, Y, and Z above, depend on measures of the distribution of income and how the distribution of income varies between groups. If the A group is relatively low income, then X is negative. Thus, holding horizontal group equity

constant, the higher is average progressivity, and the lower is the average tax rate on members of group A relative to members of the B group. Increases in either $HGEH$ or $HGEL$ raise $GATRD$, with positive weights Y and Z as long as both groups are represented in both income/well-being classes. If there's no horizontal group equity, the only source of a group average tax differential is the average progressivity of the tax system.

In the special case where $HGEH = HGEL \equiv HGE$, this reduces to

$$GATRD = DID1^*AP + (1 - DID1^*DID2)^*HGE,$$

where both $DI1$ and $DID2$ are measures of relative income inequality between group A and B, and are negative if group A members have relatively low income and are more negative the greater is the disparity; in particular

$$DID1 = \frac{n_{BL}}{n_B} - \frac{n_{AL}}{n_A} \text{ and } DID2 = \frac{n_{AH}}{n_H} - \frac{n_{AL}}{n_L}$$

If there is no relative income inequality, that is, $DID1 = DID2 = 0$, then average progressivity is irrelevant, and the only source of a group average tax rate differential is the horizontal group inequity; indeed, $GATRD = HGE$.

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