On the Economic Efficiency of Progressive Taxation

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Abstract

This paper suggests two mechanisms by which a progressive distribution of tax burdens may promote economic efficiency. First, a progressive tax rate structure indexed to the median income may discourage rent seeking by powerful interest groups. Second, progressive taxation favors income streams that are long-sustained over those that pay off over a shorter time span; this bias is likely to favor more socially productive activities. Consistent with these propositions, a marked retreat from progressivity for the top 0.1 percent of earners followed two decades of post-war economic expansion and preceded the productivity slowdown of the 1970s and the serial crises that have followed. The analysis suggests that progressivity is especially important at the top of the income distribution and that a top marginal rate that sets in too low—as would a single rate that applied to the top 0.1 percent of earners—would not achieve the right incentives.

JEL: H2, H21, D3, D31, D6, D62, D63

Keywords: Progressive Taxation, Efficiency, Equity, Rent Seeking, Prisoners’ Dilemma

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This paper explores two mechanisms by which a progressive distribution of tax burdens may improve economic efficiency. First, a progressive tax rate structure indexed to the median income may discourage rent seeking by powerful interest groups. Second, progressive taxation (even without median indexation) favors income streams that are long-sustained over those (of comparable present value before taxes or under proportional taxation) that pay off over a shorter time span; this bias is likely to favor more socially productive activities. The paper develops an index, based on an incentive constraint, of the degree of progressivity faced by individuals at specific income levels. Using this index, the paper examines how the progressivity faced by top earners in the United States has changed over the last century. We find that progressivity for the top 0.01 percent of earners increased from 1913 to 1918, then fell from 1918 to 1925 and remained minimal until 1932. Progressivity for all of the top 0.1 percent was solidly re-established by 1942 and remained robust until the tax cuts of 1964 and 1965 (perhaps surprisingly, it was these and not subsequent tax cuts that brought the greatest reduction in progressivity for the top 0.1 percent and especially the top 0.01 percent). Inflation for which tax brackets were not adjusted (“bracket creep”) further eroded progressivity at the top between 1965 and 1981. Tax cuts in the 1980s removed what little progressivity remained for the top 0.1 percent and did much to dismantle progressivity for the top 10 percent of earners; subsequent changes to the tax structure have done essentially nothing to restore it.\(^1\) Finally, the paper presents an illustrative example of a median-indexed progressive tax rate structure.

Progressivity is understood to be more than simply a high top marginal rate. The degree of progressivity someone faces—in the way that matters for the incentives considered here—depends on how quickly their average tax rate would increase if their taxable income were to increase, especially relative to the median income. Even a high top marginal rate may impose little progressivity on top earners if it sets in at too low an income level. In the United States for example, the top marginal rate sets in at less than one-half million dollars, while the top 0.1 percent of earners make over three times that. The top 0.01 percent of earners make over 14 times that, and the average CEO in the United States makes over 24 times that.\(^2\) Average CEOs (never mind the highest paid

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\(^1\) Piketty and Saez (2007) point out that changes in the personal income tax rate structure since 1960 are only a part of the overall reduction in progressivity at the top of the income distribution in the United States. Reductions in corporate, estate, and gift taxes have also played a role.

\(^2\) Incomes of the top 0.1 and 0.01 percent of U.S. earners exclude capital gains and are from Facundo Alvaredo, Anthony B. Atkinson, Thomas Piketty, and Emmanuel Saez: The World Top Incomes Database, http://topincomes.g-mond.parisschoolofeconomics.eu/. For an overview of average CEO compensation since 1965, see Mishel and Sabadish (2013).
hedge fund managers who can make hundreds of millions in one year\(^3\)) face essentially no progressivity, because average tax rates approach the top marginal rate asymptotically for incomes many times the top bracket.

Why index the tax rate structure to the median income? First, as a practical matter, setting tax brackets at certain multiples of median taxable income would adjust for both inflation and real growth. In the United States, tax brackets have been automatically adjusted for inflation since 1987, but real growth can still increase average tax burdens as a proportion of income. Under median indexation, if the entire income distribution were to experience the same rate of growth, tax revenue would grow at that same rate and average tax burdens would remain constant. But the focus here is on incentives, and especially incentives to shape public policy for the common good.

Early in the 1970s, the average taxable incomes of the top 0.1 percent and 0.01 percent of U.S. earners were, respectively, 18 times and 47 times the median. By 2012, these multiples had grown to 91 and 422.\(^4\) That this trend could reflect only differences in productivity is not plausible. Nor is it plausible that the productivity of the median U.S. earner could have increased by only about 0.25 percent per year (the average growth rate of median income) over the last four decades. Rather, these trends point to a growing disconnect between social product and private returns.

One plausible reason for this is that changes in the tax system have strengthened incentives for rent seeking—trying to capture a larger share of the economy’s output without contributing to it, often by influencing public policy making. Indexing a sufficiently progressive tax rate structure to the median income would produce a different incentive, aligning the interests of economic and political elites with the common good. Activities that enriched special interests at the expense of the median earner would carry a penalty in the form of higher taxes. There would be no need for a regulator to identify such activities ex ante: the incentive is there for the interest group itself to weigh the likely impact on the median earner of the policies it may choose to support.

Median indexation may have less bite when considering market conduct. Individuals facing opportunities to engage in privately rewarding but socially unproductive activities, even individuals who command the resources of large corporations, are not as likely to perceive their impact on the median earner: the magnitude of the impact of their individual actions is not comparable to that of public policy. Here it is useful to observe that the burden of progressive taxation does not fall equally on all income streams

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\(^{3}\)Alexandra Stevenson. “Hedge Fund Moguls’ Pay Has the 1% Looking Up.” New York Times DealB%k, May 6, 2014: http://nyti.ms/1iglnr0.

\(^{4}\)Median household incomes are from the U.S. Census Bureau.
of equal present value, as would the burden of proportional taxation. If two income
streams are equally valuable under proportional taxation, then the one with smaller
annual amounts spread over a longer period will be preferred under progressive taxation.

This stylized choice is a reasonable characterization of many economically mean-
ingful decisions, where shifting effort toward more privately rewarding and less socially
productive activities risks long-term losses to increase short-term gains. A bank for in-
stance may make overly risky investments (in some cases circumventing accounting and
financial regulations to do so), thereby capturing a higher return for its shareholders
as long as the gamble pays off and raising its risk of insolvency (passing the resulting
liability on to the deposit insurer) when it does not.

Where there is disparity between private and social returns, the market’s invisible
hand will lead to overproduction when private returns exceed social returns (or social
costs exceed private costs) and underproduction in the opposite case. It is well under-
stood that Pigouvian taxes (or subsidies) can improve efficiency in these situations by
internalizing the negative (or positive) externality. Progressive taxation can improve
efficiency in just this way if the following tends to be true: activities that pay off more
gradually over the long term are of greater social value, relative to their private rewards,
than are activities that generate more immediate, but short-lived, private returns.

This tendency can be seen, as well as in banking, in the allocation of effort between
short-term activities like marketing and long-term activities like research and develop-
ment. A pharmaceutical company for instance may shift investment from drug discovery
and development into marketing, increasing short-term profits while weakening its long-
term prospects. Such a shift would almost certainly benefit the company more than it
would society in the short run by increasing sales of its existing drugs, and harm society
more than it would the company in the long run by slowing the rate of drug discovery
and development. Similar reasoning applies to the allocation of effort over the stages of
drug research and development: a company may choose to invest more intensively in the
development of its own proprietary compounds at the expense of more basic research into
the mechanisms of a disease and the potential efficacy of a broad class of therapeutics.
The returns to proprietary drug development are more immediate, more certain, and
can be appropriated more completely by the company; the returns to precompetitive
research are farther off, and much of the value attaches to knowledge that spills over to
rival companies and the broader scientific community.

In a similar vein, a pharmaceutical company may exercise too little diligence in
ensuring that a promising drug candidate is safe before submitting its application for a
new drug approval; an off-shore drilling operation may exert too little effort to minimize
the risk of a spill; a factory or mine may exercise too little care for the safety of its workers. More generally, by shirking in some aspect of an activity that generates a lesser private benefit, an individual may capture a rent—a cost saved or an opportunity gained to pursue more intensively other aspects of the activity that generate greater private benefits—without increasing (and possibly while decreasing) the social value of the activity. The cost to the individual of this rent-seeking behavior is the risk of being eventually discovered and held to some account, either by the market (through insolvency, civil action, or the loss of reputation) or by government regulators.

If, under a given tax rate structure, the individual would be indifferent between these two streams of returns—the stream of larger per-period returns expected to be fewer in number versus the stream of smaller returns expected to persist over the long term—then the longer-term stream of returns would be preferred under a more progressive distribution of tax burdens.

This paper focuses on the incentives under median-indexed progressive taxation to engage in alternative activities. The proposal to index tax brackets to the median income is, to my knowledge, new. Also new is the observation that progressivity should promote efficiency by favoring activities that generate longer-term streams of returns. A number of other recent papers have seized on the idea that progressive taxation may improve efficiency by discouraging rent seeking, generally relying on the fact that rents constitute a larger share of higher incomes. But whereas these papers would suggest that efficiency can be improved simply by imposing higher average tax rates on those higher incomes, I would emphasize the importance of confronting these top earners with a highly progressive rate structure: high as their average rate might be, it would be higher still if they were to increase their annual income.

The paper is organized as follows: Section 1 reviews the related literature. Section 2 shows that median-indexed progressive taxation can solve a simple, two-player prisoners’ dilemma, then offers an illustrative example based on the United States’ income distribution. Section 3 shows that progressive taxation (without indexing) can solve the prisoners’ dilemma if the payoff from defecting (rent seeking, in our telling) is discounted, then draws a connection between discounted and short-term payoffs and draws a distinction between discounting and uncertainty. Section 4 provides an overview of the tax rate structure and income distribution in the United States over the last century, finding nothing to discourage and in fact much to encourage belief in the idea that a

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5 The same (or lower) social benefits are being created with greater private returns going to the individual. The additional private returns thus meet the definition of economic rents: payment greater than what should be required to bring forth the socially productive effort in the absence of any imperfection (the asymmetric information, say, that enables the rent-seeking behavior).
progressive distribution of tax burdens, especially for managers and CEOs, can promote efficiency. Section 5 offers an example of a median-indexed progressive rate structure, examines its incentive effects, and places it in historical context. Section 6 concludes.

1 Related Literature

Peter Diamond and Emmanuel Saez (2011) and N. Gregory Mankiw, Matthew Weinzierl, and Danny Yagan (2009) survey the large literature that has followed Mirrlees’ (1971) path-breaking exploration of optimal tax policy. The assumption, maintained in this literature with few exceptions, that compensation is equal to marginal product leads to the classical tradeoff between equity and efficiency. If progressivity, which promotes equity, is also to promote efficiency (by exploiting regularities in the way compensation and marginal product diverge), it must overcome any such tradeoff that is meaningful. Theory offers ambiguous predictions, as the following numerical example shows.

Consider the utility function \( u(x, y) = \ln[c(ny)] + \alpha[\ln(1 - y)] \), where \( x \) denotes consumption and \( y \) denotes labor effort. The taxable income is \( ny \) for an individual whose marginal product of effort is \( n \), and the disposable income, equal to consumption, is \( c(ny) \).\(^6\) The first-order condition for utility maximization is \( y = 1 - (\alpha/n)[c(ny)/c'(ny)] \). Replacing \( c(ny) \) with \( ny(1 - \tau) \), where \( \tau \) denotes the average tax rate on \( ny \), and replacing \( c'(ny) \) with \( (1 - \dot{\tau}) \), where \( \dot{\tau} \) denotes the marginal tax rate on \( ny \), we can solve for the optimal labor effort: \( y = 1/[1 + \alpha((1 - \tau)/(1 - \dot{\tau}))] \). A property of this utility function is that income and substitution effects exactly offset, so that optimal labor effort is insensitive to the tax rate under proportional taxation, where \( \dot{\tau} = \tau \). But under progressive taxation, where \( \dot{\tau} > \tau \), labor effort is distorted downward from \( 1/(1 + \alpha) \).

The ratio of optimal labor effort to the undistorted level is \( (1 + \alpha)/(1 + \alpha((1 - \tau)/(1 - \dot{\tau})))] \). Under the 2013 U.S. tax rate schedule, this distortion would have been greatest just above \$450,000 taxable income, where the top marginal rate of 39.6 percent set in and where the average rate would have been around 28 percent. The labor effort actually exerted to generate \$450,000 taxable income would have been either 91, 94, 96, or 98 percent of the undistorted level, corresponding to \( \alpha \) values of 1, 0.5, 0.25, or 0.1. Thus even if one is willing to accept that compensation is equal to marginal social product, so that any distortion in an individual’s choice of effort is inefficient, theory is agnostic on the magnitude of the distortion, and so it becomes an empirical question.\(^7\)

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\(^6\) The notation and functional form are from Mirrlees (1971, p.193).

\(^7\) On the sensitivity of optimal tax rates to the specification of a utility function, see Diamond (1998) and Dahan and Strawczynski (2000).
Evidence is generally consistent with labor supply elasticities close to zero at the top of the income distribution. Higher elasticities of taxable income are more likely to reflect avoidance than labor-supply and savings responses. On these issues, see Saez, Slemrod, and Giertz (2012) and Slemrod (2000). Greater avoidance behavior motivated by higher tax rates is certainly a source of inefficiency, but this is not the classic equity-efficiency tradeoff and does not present a compelling case for lowering tax rates or reducing the amount of progressivity. Rather, “if behavioral responses to taxation are large in the current tax system, the best policy response would not be to lower tax rates, but instead to broaden the tax base and eliminate avoidance opportunities to lower the size of the behavioral response” (Saez, Slemrod, and Giertz, 2012, p. 42).

Recent evidence from macroeconomic data suggests that equity—even equity achieved by income redistribution—does not impede long-term growth. Berg and Ostry (2011) find a robust association between equity and the duration of periods of growth. Ostry, Berg, and Tsangerides (2014) find that equity continues to predict sustainable growth after controlling for the extent of redistribution, and that redistribution does not itself appear to have adverse effects on growth.

Bivens and Mishel (2013), and sources reviewed therein, find evidence that economic rents contribute disproportionately to the incomes of the top 1 percent. The case seems especially strong not for incomes that just slip into the top 1 percent—incomes of between $400,000 and $500,000 that might be expected for successful entrepreneurs, say—but for the top 0.1 percent where we find the managers and CEOs of large corporations. Rents are payment in excess of what is necessary to bring forth a given level of productive effort, and can therefore be taxed at high rates—and subjected to highly progressive rate structures—without creating any inefficiency. In this light, the United States rate structure seems particularly misguided—imposing the least amount of progressivity on incomes that are most likely to comprise rents. The argument of Bivens and Mishel (2013) and others is that if rents are concentrated at the top of the income distribution then higher tax rates on these incomes can ameliorate equity with little cost to efficiency.

Three recent papers go a step further by arguing that taxing at higher rates incomes that are disproportionately comprised of rents can improve efficiency by discouraging rent seeking. In these papers, higher tax rates on rent-intensive income strata work like Pigouvian taxes to discourage the production of negative externalities. Piketty, Saez, and Stantcheva (2014) decompose the elasticity of taxable income into the real labor supply elasticity, a tax avoidance elasticity, and a compensation bargaining (rent-seeking) elasticity. They add to the standard formula for the revenue-maximizing top marginal rate a Pigouvian correction term to internalize the rent-seeking externality.
Rothschild and Scheuer (2014) consider the case where externalities generated by rent seeking operate only through the marginal products of productive and rent-seeking effort. They show that when externalities are more concentrated in the rent-seeking activities, the optimal correction is less than the Pigouvian correction, so as not to discourage too much the effort of inframarginal rent-seekers (those individuals who will not be steered toward socially productive activity by the tax regime), which is helpful in deterring entry into the rent-seeking sector by individuals who are otherwise productively employed. Lockwood, Nathanson, and Weyl (2014) explore how higher tax rates can blunt material incentives and so elevate the less tangible private benefits of pursuing a calling, which is likely to be socially productive.

This paper joins these three in exploring mechanisms through which the income tax system can promote efficiency by discouraging socially unproductive activity. The focus here is on progressivity, rather than on the average or marginal rate at a given level of income. A tax system may impose a high top marginal rate and yet fail to achieve progressivity at the top of the income distribution if that top rate sets in too low. Discounting of private returns, which I will argue is characteristic of socially unproductive activities, will play a central role in the present arguments. Discounting may be seen as a reduced-form representation of a Lockwood-Nathanson-Weyl utility function in which the private returns to effort comprise both psychic payoffs and consumption. Seen this way, their insights apply equally well to choices of how to apply oneself within a given profession as they do to choices of profession—not only whether to apply a law school education to scholarship or to litigation, say, but also how to wield one’s litigious spear once having chosen that profession.

We will see that exploiting the discounting of rent-seeking returns has still broader application and appeal, as it can selectively discourage socially costly aspects of otherwise productive activities. Neglecting environmental safeguards, or testing the limits of antitrust or banking regulations, for instance, may generate private returns that are discounted due to the risk of future liability. This risk may internalize part of the social cost of the bad behavior, but in many cases it can be argued that this is insufficient to produce the socially optimal level of care or prudence. Enforcement effort is costly, and the size of penalties may be constrained by limited liability or for other reasons.8 A progressive distribution of tax burdens (faced by managers and owners of companies) can leverage the deterrent effect of a given regulatory regime.

8Prosecutors may be hesitant to indict large banks for instance for fear of the economic fallout if a guilty verdict were to cause the bank’s regulator to revoke its charter. Without the credible threat of indictment, settlements are unlikely to impose meaningful penalties on banks.
This paper also shows that progressive taxation can exploit the short-term bias characteristic of less productive activities. Shifting effort from socially productive research and development into privately rewarding but socially wasteful marketing, for example, may increase profits in the short-term while incurring greater risk of succumbing to creative destruction wrought by rival firms. This risk causes the returns to the short-term strategy to be discounted, and progressive taxation therefore favors the socially more productive long-term strategy. This paper also points out an important benefit of indexing tax brackets to the median income: to discourage lobbying for policies that would harm average citizens. It is this mechanism that we will examine first.

2 Solving the Prisoners’ Dilemma

The intuition we are after begins with the observation that progressive taxation can solve the prisoners’ dilemma, perhaps the simplest useful model of a situation in which individuals’ maximizing behavior can leave everyone worse off. To see this, consider the following version of the prisoners’ dilemma with two players, who can choose to engage in either productive work or privately rewarding but socially wasteful activities we will call rent seeking (Figure 1). If both players work, each gets a payoff of 10. If both engage in rent seeking, each gets 8. If one engages in rent seeking while the other works, the rent-seeker gets 12 and the worker gets 6.

![Figure 1: Prisoners’ Dilemma.](image)

Rent seeking is a dominant strategy for each player, meaning that it provides the highest payoff regardless of what the other player chooses to do. The equilibrium of the game therefore involves both players choosing rent seeking, the outcome with the lowest sum of players’ payoffs. Consider the effect of taxing payoffs at the rate of 70 percent and redistributing the revenue in equal lump sums. The symmetrical outcomes

Rent seeking serves as a concise label for economic activity that generates private returns and social losses. Think of lobbying, high-frequency trading, and predatory lending. The economics definition of rent is payment in excess of what is required for a good or service to be produced—essentially overpayment that does not elicit greater productive activity. Rent seeking then is activity that wastes resources in trying to appropriate a larger share of rents.
are unchanged, since the players pay equal taxes and therefore receive equal subsidies. But the asymmetrical outcome is altered in a way that changes the structure of the game. After-tax payoffs will be $(0.3)(12) + (0.7)(12 + 6)/2 = 9.9$ for the rent-seeker and $(0.3)(6) + (0.7)(12 + 6)/2 = 8.1$ for the worker (Figure 2). Work is now the dominant strategy for each player, and the equilibrium of the game therefore involves both players choosing to work.

Figure 2: A Prisoners’ Dilemma No Longer.

<table>
<thead>
<tr>
<th>Player 2</th>
<th>work</th>
<th>rent seeking</th>
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<tbody>
<tr>
<td>Player 1</td>
<td>work</td>
<td>rent seeking</td>
</tr>
<tr>
<td>work</td>
<td>10, 10</td>
<td>8.1, 9.9</td>
</tr>
<tr>
<td>rent seeking</td>
<td>9.9, 8.1</td>
<td>8, 8</td>
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With such a simple model, what have we really shown? First, observe that our tax scheme is progressive with respect to the average payoff, not in absolute terms. The tax rate is the same (zero) for payoffs of 10 in the working equilibrium as it is for payoffs of 8 in the rent-seeking equilibrium. It is progressive in the sense that payoffs that are higher relative to the average are taxed at higher rates (17.5 percent of 12 and negative 35 percent of 6 in the asymmetrical outcome). This suggests that a progressive tax rate structure indexed to the median income (in the sense that the brackets are fixed multiples of median income) may be able to discourage activities that enrich small numbers of individuals at the expense of most others. Consider for example the activities of interest groups that seek rents for their members through the exercise of political clout. Gilens and Page (2014) offer evidence that in the United States the preferences of the most influential interest groups are not aligned with the preferences of ordinary citizens. Might this be different under median-indexed progressive taxation?

Certainly the social cost of an activity must be very large for it to have an appreciable impact on the median income, which is necessary for this device to have any practical impact. Taking an example of a median-indexed progressive tax structure, we can make a start at understanding the relevant orders of magnitude. Under the structure presented as an example in Section 5, the average tax rate is a function of taxable income over median income, $w/w_m$, and can be approximated by $1 - \beta e^{\alpha[1-(w/w_m)\gamma]}$, with $\beta = 0.9$, $\alpha = 0.23$, and $\gamma = 0.31$. Disposable income under this scheme is $w\beta e^{\alpha[1-(w/w_m)\gamma]}$.

Figure 3 shows several indifference curves, assuming that utility is identified with disposable income, in a space with one’s own taxable income on the horizontal and the median income on the vertical. Under any tax structure not indexed to the median
income, no matter how progressive, these indifference curves would of course be vertical lines: the median income would not enter into one’s preferences. The lighter, steeper set of indifference curves describe the preferences of someone with annual taxable income of $7 million; the darker, flatter set describe the preferences of someone with annual taxable income of $12 million. Each set describes the preferences of someone contemplating supporting policies that would increase his taxable income by roughly $100,000, $1,000,000, $2,500,000, or $5,000,000. The given increase can be achieved without any effect on the median income (of $51,000) or, as we move along an indifference curve, a greater increase can be achieved at the expense of the median earner or a lesser increase can be achieved while enriching the median earner.

Figure 3: Indifference Curves under Median-Indexed Progressive Taxation.

Suppose that an individual has annual taxable income of around $7 million and is contemplating supporting policies that would increase this amount by roughly $2.5 million.\textsuperscript{10} If an increase of $2.5 million could be achieved without any effect on the median earner, this individual would be willing to forgo a 10 percent greater increase (of $2.75 million instead of $2.5) if such an increase would come at a cost to the median earner of more than 4.3 percent of his income. The individual would be satisfied with a 10 percent lesser increase (of only $2.25 million) if such sacrifice would enrich the

\textsuperscript{10}To be exact, the indifference curves are drawn for someone with $7,205,236 to start, which was the threshold of the top 0.01 percent in 2012 (Table 2).
median earner by at least 4.8 percent. For an individual with annual taxable income of $12 million to start, contemplating the same roughly $2.5 million increase plus or minus 10 percent, the larger increase would be happily forgone if it would cost the median earner more than 2.4 percent, and the lesser increase would be preferred if it would enrich the median earner by at least 2.6 percent.

In the United States, the income shares of the top 1, 0.1, and 0.01 percent now stand at around 19, 9, and 4 percent, respectively, up from 8, 2, and less than 1 percent in the late 1970s. From 1976 to 2012, the average taxable incomes of the top 1, 0.1, and 0.01 percent grew at average annual rates of 3.0, 4.6, and 6.1 percent, respectively, while the median household income grew at an average annual rate of 0.25 percent. Disposable incomes of top earners have grown more rapidly, because their average tax rates have fallen. Had the top 1, 0.1, and 0.01 percent of earners experienced the same rates of growth in taxable income under the median-indexed rate structure offered as an example here, their disposable incomes would have grown at 2.6, 3.6, and 4.1 percent per year. Under this rate structure, the top 0.01 percent would have done equally well, and the rest of the top 1 percent would have done strictly better, had the entire income distribution experienced equitable growth of 4.1 percent per year. In this rosey counterfactual, the median income today would exceed $200,000.

These numerical examples can serve as a starting point for analysis that identifies the winners and losers of various policies and the magnitudes of the gains and losses to answer the question of whether (or when) a tax structure like this one could lead to appreciably different lobbying behavior and policy debate.

Median-indexation may at least partly address the concern raised by Rothschild and Scheuer (2014) that too much progressivity may discourage inframarginal rent-seeking effort, and so offset its benefits by encouraging entry into the rent-seeking sector. Rent-seeking behavior that afflicts only other rent-seekers is not discouraged by median-indexed progressivity—or at least less so than rent seeking that afflicts the median earner.

3 Exploiting the Discounting of Rent Seeking

Without median indexation, progressivity can still discourage socially wasteful activities if their private returns are discounted relative to the private returns to socially productive work. To see this, consider again our prisoners’ dilemma game, but let rent-seeking payoffs now be discounted by a factor $\delta < 1$. For the moment, think of this as a psychic discount factor, as if rent seeking is inherently less pleasurable than productive work.
Figure 4: Prisoners’ Dilemma with Discounting.

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<tr>
<td>10, 10</td>
<td>6, 12δ</td>
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</tr>
<tr>
<td>12δ, 6</td>
<td>8δ, 8δ</td>
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We will assume that \( \delta \) is not small enough to solve the prisoners’ dilemma for us. That is, we will assume that \( 12\delta > 10 \), which implies also \( 8\delta > 6 \). Consider a simple progressive tax rate structure that taxes payoffs greater than 6 at a single rate, \( t \). To kill the rent-seeking equilibrium, we must set \( t \) large enough that \( 6 > \delta(6 + 2(1 - t)) \). This reduces to \( t > (8\delta - 6)/2\delta \). We can confirm that this condition is sufficient to also create the working equilibrium: \( 6 + 4(1 - t) > \delta(6 + 6(1 - t)) \) if and only if \( t > (12\delta - 10)/(6\delta - 4) \), and it is easy to verify that \( (8\delta - 6)/2\delta > (12\delta - 10)/(6\delta - 4) \).

While the revenue collected could be redistributed to the players in lump-sum transfers, in effect indexing the rate structure to the median (or average) payoff like before, this is no longer necessary to implement the working equilibrium. The more progressive the distribution of tax burdens, the larger the ratio of the working payoff’s after-tax value to that of the rent-seeking payoff; when this ratio exceeds \( \delta \), work is preferred. To make this point more generally, suppose that work yields a taxable income of \( w_0 \) before tax while rent seeking yields \( w_0 + \Delta w \). The tax rate structure is such that after-tax incomes are \( w_0(1 - t) \) for work and \( w_0(1 - t_0) + \Delta w(1 - \Delta t) \) for rent seeking. Disposable income from rent seeking is discounted by a factor \( \delta^* < 1 \). We will assume that rent seeking is preferred under proportional taxation, where \( \Delta t = t_0 \), so that we have \( \delta^*(w_0 + \Delta w) > w_0 \), which implies \( (\Delta w/w_0)[\delta^*/(1 - \delta^*)] > 1 \).

Work is preferred if the following incentive constraint is satisfied:

\[
\frac{w_0(1 - t_0) + \Delta w(1 - \Delta t) - 1}{(1 - t_0)/(1 - \Delta t)} > \frac{\Delta w/w_0}[\delta^*/(1 - \delta^*)] > 1
\]

Rewriting (1) as \( (1 - t_0)/(1 - \Delta t) > (\Delta w/w_0)[\delta^*/(1 - \delta^*)] \) and recognizing that the right-hand side of this inequality is greater than one (on the assumption that rent seeking is preferred under proportional taxation), we can see that incentive compatibility requires \( \Delta t > t_0 \), consistent with progressive taxation.

Lockwood, Nathanson, and Weyl (2014) develop the intuitive idea that socially more productive activities are typically more psychically satisfying. The discount factor \( \delta^* \) can also be thought of as describing the effects of imperfect efforts to regulate unproductive aspects of otherwise productive activity. A business owner may increase his income (from
to $w_0 + \Delta w$) by skipping certain safety precautions (diligently screening borrowers’
creditworthiness or testing cement used to seal offshore oil wells, say), incurring some risk
that he will be found liable for a bad outcome (resulting in the loss of all his income with
probability $1 - \delta^*$). A given regulatory framework, combining market aspects like product
liability with aspects of government oversight, will typically prevent some instances of
misbehavior and not others. The argument here is that regulation can be more effective
and efficient—preventing more misbehavior with a given amount of resources devoted
to oversight and litigation—when the distribution of tax burdens is more progressive.

3.1 Short-Termism

Privately rewarding but socially unproductive activities that are enabled by imperfect
information and enforcement will often have a short-term bias. Where the presumption
is that society would not allow the activities to go on if it knew about them, perceived
their full long-run implications, and had the means to proscribe them, these activities
can be seen as term-limited—going on under threat of public discovery that would end
them. This is another way of interpreting the discount factor $\delta^*$, and our earlier examples
of imperfect regulation fit this concept nicely.

To make this explicit, let us extend our simple model to multiple periods and suppose
that the productive activity continues with certainty while the unproductive activity
may end. Specifically, conditional on the unproductive activity paying off in any given
period, the probability that it will pay off in the following period is $p$. The individual
discounts future income by a factor $\delta$ per period, so that the value to the individual
of the productive activity is $w_0(1 - t_0)(1 + \delta + \delta^2 + ...)$, or $w_0(1 - t_0)(1 - \delta)$, and the
value of the unproductive activity is $[w_0(1 - t_0) + \Delta w(1 - \Delta t)](1 + \delta p + \delta^2 p^2 + ...)$, or
$[w_0(1 - t_0) + \Delta w(1 - \Delta t)]/(1 - \delta p)$.

We will again assume that the rent-seeking activity is preferred under a proportional
tax rate structure, where $\Delta t = t_0$, so that $(w_0 + \Delta w)/(1 - \delta p) > w_0/(1 - \delta)$. We want
to know for what values of $\Delta t$ the individual will prefer the productive activity:

$$w_0(1 - t_0)/(1 - \delta) > [w_0(1 - t_0) + \Delta w(1 - \Delta t)]/(1 - \delta p)$$

This incentive constraint is easily recognized as equivalent to (1), with a discount
factor of $\delta^* = (1 - \delta)/(1 - \delta p)$, which is less than one as long as $p < 1$. Therefore
incentive compatibility again requires $\Delta t > t_0$, consistent with a progressive distribution
of tax burdens.

We have considered several examples—from banking, drug research and market-
ing, product safety—in which socially more productive activities generate longer-term streams of private returns compared with relevant alternatives that are socially wasteful. As a counterexample, consider the textbook tale of tacit collusion between price-setting duopolists in a repeated prisoners’ dilemma. There, the long-term strategy is to sustain collusion by setting supracompetitive prices; the socially desireable outcome is for the short-term gain to be had by either firm undercutting the rival’s price to be so tempting that collusion cannot be sustained. Under progressive taxation, the short term gain of undercutting one’s rival is a blander carrot, and so collusion might indeed be more sustainable.\(^{11}\) On the other hand, rivals’ strategies are typically multidimensional, and strong incentives to pursue short-term gains could plausibly lead to outcomes less socially desireable than a lower price for a good or service. More intensive marketing is one possibility. Another is that lower prices could be combined with subtle changes to the product that reduce its quality in ways that are not as immediately apparent to consumers as its lower price.

### 3.2 Uncertainty

In some instances, socially productive activities (like research and development) may generate more variable or uncertain streams of returns compared to relevant alternatives that are less socially productive (like marketing). Progressivity will still favor the more socially productive activities as long as returns to the unproductive activities are more heavily discounted. To see this, let us extend the single-period model to an environment with uncertain taxable income. To keep the exposition simple and focus on first-order effects, we will continue to assume that individuals maximize disposable income.\(^{12}\) Let taxable income be \(w \in \{w_1, w_2, \ldots\}\), such that \(w_n = \Delta w_n\), for some constant \(\Delta w\). The marginal tax rate at \(w_n\) is \(\tau_n\), so that when taxable income is \(w_n\) disposable income is 

\[
\sum_{i=1}^{n} (1 - \tau_i) \Delta w.
\]

To capture the idea that the unproductive activity yields higher expected (and potentially less variable) returns, assume \(\Pr(w \geq w_i) = \pi_i\) for the productive activity and \(\Pr(w \geq w_i) = \bar{\pi}_i\) for the unproductive activity, with \(\bar{\pi}_i \geq \pi_i\) for all \(i\). As before, we will consider a case where the unproductive activity is preferred under proportional taxation, where \(\tau_i = \tau_j\) for all \((i, j)\), so that, after canceling \((1 - \tau_i)\Delta w\) from the summations on either side of the inequality, we have \(\delta^* \sum_i \bar{\pi}_i > \sum_i \pi_i\), which can be written 

\[
\sum_i (\delta^* \bar{\pi}_i - \pi_i) > 0.
\]

Again, the discount factor \(\delta^*\) can be interpreted as the percentage of

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\(^{11}\)I am grateful to Charlie Brown for pointing out this important example.

\(^{12}\)With a concave utility function, progressive taxation may tend either to encourage or discourage risk-taking. See Schneider (1980) and Bamberg and Richter (1984).
Incentive compatibility requires \( \sum_i \pi_i (1 - \tau_i) > \delta^* \sum_i \tilde{\pi}_i (1 - \tau_i) \), which can be written as \( \sum_{i=1}^m \pi_i (1 - \tau_i) + \sum_{i>m} \pi_i (1 - \tau_i) > \sum_{i=1}^m \delta^* \tilde{\pi}_i (1 - \tau_i) + \sum_{i>m} \delta^* \tilde{\pi}_i (1 - \tau_i) \). Combining terms, we have

\[
\sum_{i=1}^m (\pi_i - \delta^* \tilde{\pi}_i)(1 - \tau_i) > \sum_{i>m} (\delta^* \tilde{\pi}_i - \pi_i)(1 - \tau_i).
\]

Equation (4) can be reconciled with (3) only if \( \tau_i \) tends to be larger for \( i > m \), which in practice (knowing that \( m \) will vary from one instance to another) requires a progressive distribution of tax burdens over the entire income distribution. The extension of this analysis to the multi-period setting of Section 3.1 is straightforward.

4 Whither Progressivity?

Writing in 1980, Robert Hayes and William Abernathy (1980) took American managers to task for competitive myopia—for overemphasizing short-term cost-reduction at the expense of long-term competitiveness driven by innovation (“developing new products and processes that open new markets or restructure old ones”). If short-termism had already taken hold to such an extent before the tax cuts and deregulation of the 1980s, and if progressive taxation has the effect of discouraging short-termism, we might expect to find a reduction in progressivity in the United States prior to 1980. Indeed we do

13 A fraction \( \phi \), say, is expected to be lost with probability \( (1 - \delta^*)/\phi \). Increasing marketing effort at the expense of maintaining a full and balanced drug development pipeline, for example, may increase profits and reduce their variability in the short run while also reducing the probability that as existing patents expire new discoveries will be forthcoming at a rate sufficient to keep the pharmaceutical company solvent in the future.

14 In a sidebar to a 2007 HBR reprint of the 1980 article, which appeared in July amid the turmoil of the subprime crisis, Robert Hayes observed that their “call to get back to basics became American managers’ mantra of the 1980s” but that in the 1990s attention shifted to “panning for gold in the business opportunities that the ‘new economy’ had created.” I would interject a note of skepticism as to whether short-termism did in fact take a holiday in the 1980s, the decade that brought us the savings and loan crisis.
find such a reduction, in 1964 and 1965, and its particulars may be helpful in suggesting both where in the income distribution progressivity is likely to matter and how much progressivity is needed.

Recall the incentive constraint (2). To have a convenient numerical example, we will fix \( \delta = 0.95 \) and \( \delta p = 0.9 \), so that the incentive constraint becomes:

\[
w_0(1 - t_0) > \Delta w (1 - \Delta t)
\]

Under proportional taxation \( (\Delta t = t_0) \), faced with a choice between \( w_0 \) per period forever and \( w_0 + \Delta w \) per period that continues with probability \( (0.9/0.95) \), one would take the long-term (productive) option as long as \( w_0 > \Delta w \). The more progressive the tax system in the range above \( w_0 \), the larger \( \Delta w/w_0 \) can be without making the short-term (unproductive) option the more attractive one. We will denote by \( \Delta w^* \) the maximum incentive-compatible ratio \( \Delta w/w_0 \), and this will serve as a rough index of the amount of progressivity around a specific level of income. Table 1 shows \( \Delta w^* \) where \( w_0 \) is the upper bound on the bottom 90, 95, 99, 99.5, 99.9, and 99.99 percent of income tax returns, based on taxable income, for selected years since the introduction of the United States federal income tax system.

Tax rates for the top 10 percent of earners were lowered in 1964 and again in 1965 (Tables 2 and 3). There was some reduction in \( \Delta w^* \) for all income thresholds, but it was small enough to probably be inconsequential—except for the top 0.1 percent of earners (Table 1). From 1963 to 1965, \( \Delta w^* \) fell from 2.308 to 1.612 at the 99.9 percent threshold and from 3.849 to 1.656 at the 99.99 percent threshold.

Nominal brackets remained constant from 1965 through 1976, and were adjusted slightly (and incompletely) for inflation from 1977 through 1981. Between 1965 and 1981, the effect of inflation was to push much of the income distribution into higher tax brackets, and to raise the average tax rate for everyone. For the 90\(^{th}\) through the 98\(^{th}\) percentiles, the effect was also to slightly increase the amount of progressivity. At the 90 percent threshold, \( \Delta w^* \) increased to 1.573 in 1981 from 1.118 in 1965. At the 99.99 percent threshold however, progressivity decreased as incomes outgrew the top bracket: \( \Delta w^* \) fell to 1.211 at the 99.99 percent threshold, which grew from $892,764 in 1965 (when the real top bracket was $1,457,740) to $1,326,395 in 1981 (when the real top bracket was $544,054).

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15 The \( nn.nn \) threshold is the level of taxable income greater than that of \( nn.nn \) percent of filers.

16 Real 2012 dollars are reported. The nominal top brackets (at which the top marginal rate of 70 percent set in) were $215,400 in 1981 and $200,000 in 1965.
Table 1: Maximum Incentive-Compatible $\Delta w/w_0$ ($\Delta w^*$)

<table>
<thead>
<tr>
<th>Year</th>
<th>90</th>
<th>95</th>
<th>99</th>
<th>99.5</th>
<th>99.9</th>
<th>99.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918</td>
<td>1.000</td>
<td>1.028</td>
<td>1.082</td>
<td>1.089</td>
<td>1.262</td>
<td>2.075</td>
</tr>
<tr>
<td>1925</td>
<td>1.006</td>
<td>1.012</td>
<td>1.040</td>
<td>1.061</td>
<td>1.134</td>
<td>1.099</td>
</tr>
<tr>
<td>1932</td>
<td>1.000</td>
<td>1.009</td>
<td>1.046</td>
<td>1.045</td>
<td>1.130</td>
<td>1.685</td>
</tr>
<tr>
<td>1936</td>
<td>1.000</td>
<td>1.021</td>
<td>1.054</td>
<td>1.075</td>
<td>1.243</td>
<td>1.882</td>
</tr>
<tr>
<td>1942</td>
<td>1.065</td>
<td>1.094</td>
<td>1.327</td>
<td>1.599</td>
<td>2.368</td>
<td>2.674</td>
</tr>
<tr>
<td>1955</td>
<td>1.073</td>
<td>1.110</td>
<td>1.358</td>
<td>1.599</td>
<td>2.122</td>
<td>3.688</td>
</tr>
<tr>
<td>1963</td>
<td>1.129</td>
<td>1.191</td>
<td>1.559</td>
<td>1.722</td>
<td>2.308</td>
<td>3.849</td>
</tr>
<tr>
<td>1964</td>
<td>1.125</td>
<td>1.166</td>
<td>1.427</td>
<td>1.567</td>
<td>1.739</td>
<td>1.962</td>
</tr>
<tr>
<td>1965</td>
<td>1.118</td>
<td>1.161</td>
<td>1.411</td>
<td>1.513</td>
<td>1.612</td>
<td>1.656</td>
</tr>
<tr>
<td>1976</td>
<td>1.376</td>
<td>1.461</td>
<td>1.592</td>
<td>1.640</td>
<td>1.655</td>
<td>1.321</td>
</tr>
<tr>
<td>1981</td>
<td>1.573</td>
<td>1.637</td>
<td>1.733</td>
<td>1.757</td>
<td>1.546</td>
<td>1.211</td>
</tr>
<tr>
<td>1985</td>
<td>1.354</td>
<td>1.368</td>
<td>1.341</td>
<td>1.292</td>
<td>1.139</td>
<td>1.044</td>
</tr>
<tr>
<td>1987</td>
<td>1.239</td>
<td>1.214</td>
<td>1.142</td>
<td>1.102</td>
<td>1.044</td>
<td>1.013</td>
</tr>
<tr>
<td>1989</td>
<td>1.103</td>
<td>1.080</td>
<td>1.040</td>
<td>1.027</td>
<td>1.011</td>
<td>1.003</td>
</tr>
<tr>
<td>1993</td>
<td>1.136</td>
<td>1.156</td>
<td>1.174</td>
<td>1.158</td>
<td>1.069</td>
<td>1.019</td>
</tr>
<tr>
<td>2012*</td>
<td>1.142</td>
<td>1.162</td>
<td>1.125</td>
<td>1.154</td>
<td>1.055</td>
<td>1.012</td>
</tr>
</tbody>
</table>

*2013 tax rates applied to the 2012 income distribution.


Progressivity was further dismantled by the collapsing of brackets and lowering of rates in the subsequent tax cuts of the 1980s. There has been essentially no progressivity for the top 10 percent of the income distribution in the last 25 years: $\Delta w^*$ has been less than 1.2 for all thresholds since 1989 (Table 1). In 2013, the top marginal tax rate of 39.6 percent set in at $450,000 (for married filing jointly), in between the (2012) 99 percent threshold of $371,689 and the 99.5 percent threshold of $551,622. The 99.9 and 99.99 percent thresholds in 2012 were $1,549,616 and $7,205,236, respectively, and average CEO compensation in the United States in 2011 was around $12 million.\(^{17}\)

The present arguments suggest that reductions in progressivity, by increasing the private returns to less socially productive activities, could have contributed to the long-term trend toward greater income concentration at the top of the income distribution and stagnating real earnings in the middle.

\(^{17}\)See Mishel and Sabadish (2013).
Table 2: Taxable Income (constant 2012 dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>90</th>
<th>95</th>
<th>99</th>
<th>99.5</th>
<th>99.9</th>
<th>99.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918</td>
<td>28,584</td>
<td>38,189</td>
<td>92,221</td>
<td>143,220</td>
<td>442,731</td>
<td>1,791,550</td>
</tr>
<tr>
<td>1925</td>
<td>32,813</td>
<td>42,812</td>
<td>103,376</td>
<td>162,549</td>
<td>452,424</td>
<td>1,505,357</td>
</tr>
<tr>
<td>1932</td>
<td>21,875</td>
<td>37,360</td>
<td>78,054</td>
<td>112,098</td>
<td>295,551</td>
<td>1,114,678</td>
</tr>
<tr>
<td>1936</td>
<td>30,606</td>
<td>43,632</td>
<td>103,254</td>
<td>157,614</td>
<td>446,356</td>
<td>1,615,313</td>
</tr>
<tr>
<td>1942</td>
<td>41,856</td>
<td>50,773</td>
<td>116,538</td>
<td>183,217</td>
<td>484,061</td>
<td>1,485,176</td>
</tr>
<tr>
<td>1955</td>
<td>56,674</td>
<td>70,784</td>
<td>146,691</td>
<td>209,271</td>
<td>406,317</td>
<td>998,284</td>
</tr>
<tr>
<td>1963</td>
<td>71,266</td>
<td>88,262</td>
<td>171,560</td>
<td>223,459</td>
<td>404,618</td>
<td>917,693</td>
</tr>
<tr>
<td>1964</td>
<td>74,353</td>
<td>89,023</td>
<td>172,503</td>
<td>232,886</td>
<td>413,066</td>
<td>884,404</td>
</tr>
<tr>
<td>1965</td>
<td>76,562</td>
<td>93,629</td>
<td>175,888</td>
<td>243,753</td>
<td>425,058</td>
<td>892,764</td>
</tr>
<tr>
<td>1976</td>
<td>90,482</td>
<td>112,620</td>
<td>201,529</td>
<td>266,921</td>
<td>496,693</td>
<td>1,215,162</td>
</tr>
<tr>
<td>1981</td>
<td>90,812</td>
<td>112,847</td>
<td>195,292</td>
<td>255,526</td>
<td>502,845</td>
<td>1,326,395</td>
</tr>
<tr>
<td>1985</td>
<td>93,918</td>
<td>117,487</td>
<td>207,981</td>
<td>270,107</td>
<td>592,761</td>
<td>1,874,616</td>
</tr>
<tr>
<td>1987</td>
<td>98,412</td>
<td>123,101</td>
<td>233,556</td>
<td>323,604</td>
<td>744,567</td>
<td>2,544,475</td>
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<tr>
<td>1989</td>
<td>100,597</td>
<td>129,792</td>
<td>260,704</td>
<td>378,645</td>
<td>934,588</td>
<td>3,388,158</td>
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<tr>
<td>1993</td>
<td>99,194</td>
<td>128,400</td>
<td>264,968</td>
<td>375,113</td>
<td>899,154</td>
<td>3,303,827</td>
</tr>
<tr>
<td>2012</td>
<td>112,200</td>
<td>157,510</td>
<td>371,689</td>
<td>551,622</td>
<td>1,549,616</td>
<td>7,205,236</td>
</tr>
</tbody>
</table>

Table 3: Average Tax Rates (percent)

<table>
<thead>
<tr>
<th>Year</th>
<th>90</th>
<th>95</th>
<th>99</th>
<th>99.5</th>
<th>99.9</th>
<th>99.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918</td>
<td>6.0</td>
<td>6.0</td>
<td>8.2</td>
<td>10.4</td>
<td>17.0</td>
<td>39.6</td>
</tr>
<tr>
<td>1925</td>
<td>1.5</td>
<td>1.5</td>
<td>2.2</td>
<td>3.4</td>
<td>8.0</td>
<td>17.5</td>
</tr>
<tr>
<td>1932</td>
<td>4.0</td>
<td>4.0</td>
<td>4.6</td>
<td>5.7</td>
<td>8.8</td>
<td>21.8</td>
</tr>
<tr>
<td>1936</td>
<td>4.0</td>
<td>4.0</td>
<td>5.5</td>
<td>6.9</td>
<td>13.0</td>
<td>33.4</td>
</tr>
<tr>
<td>1942</td>
<td>20.0</td>
<td>20.3</td>
<td>24.6</td>
<td>29.2</td>
<td>45.8</td>
<td>66.2</td>
</tr>
<tr>
<td>1955</td>
<td>20.8</td>
<td>21.2</td>
<td>25.1</td>
<td>28.6</td>
<td>39.6</td>
<td>56.7</td>
</tr>
<tr>
<td>1963</td>
<td>21.8</td>
<td>22.6</td>
<td>27.9</td>
<td>31.4</td>
<td>42.0</td>
<td>57.6</td>
</tr>
<tr>
<td>1964</td>
<td>19.5</td>
<td>20.2</td>
<td>25.1</td>
<td>28.6</td>
<td>38.2</td>
<td>50.8</td>
</tr>
<tr>
<td>1965</td>
<td>18.4</td>
<td>19.2</td>
<td>23.7</td>
<td>27.7</td>
<td>36.7</td>
<td>48.3</td>
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<tr>
<td>1976</td>
<td>23.0</td>
<td>25.3</td>
<td>34.1</td>
<td>38.7</td>
<td>48.4</td>
<td>60.4</td>
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<tr>
<td>1981</td>
<td>23.6</td>
<td>27.4</td>
<td>37.5</td>
<td>42.2</td>
<td>53.4</td>
<td>63.7</td>
</tr>
<tr>
<td>1985</td>
<td>20.4</td>
<td>23.6</td>
<td>31.5</td>
<td>35.0</td>
<td>43.0</td>
<td>47.8</td>
</tr>
<tr>
<td>1987</td>
<td>20.8</td>
<td>23.7</td>
<td>29.8</td>
<td>32.2</td>
<td>35.8</td>
<td>37.7</td>
</tr>
<tr>
<td>1989</td>
<td>20.6</td>
<td>22.3</td>
<td>25.1</td>
<td>26.0</td>
<td>27.2</td>
<td>27.8</td>
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<tr>
<td>1993</td>
<td>20.3</td>
<td>22.1</td>
<td>27.3</td>
<td>29.9</td>
<td>35.5</td>
<td>38.5</td>
</tr>
<tr>
<td>2012</td>
<td>17.9</td>
<td>20.2</td>
<td>26.8</td>
<td>30.3</td>
<td>36.3</td>
<td>38.9</td>
</tr>
</tbody>
</table>


Tables 1–3 are based on earned income tax rates and therefore fail to capture a further reduction in progressivity since the early 1990s. When the top marginal rate on earned income was raised from 31 percent to 39.6 percent in 1993, the top rate on capital income remained at 28 percent, and it was lowered to 20 percent in 1997 and to 15 percent in 2003. Most dividends have been taxed to individuals as capital income since the passage of the Jobs and Growth Tax Relief and Reconciliation Act of 2003. Prior to the Act, dividends were taxed as ordinary income. In the marked rise in dividends following the 2003 tax cut, which reduced the top marginal rate on dividends from 38.6 to 15 percent, Chetty and Saez (2005, 2010) find evidence of a distortionary effect of dividend taxation—blunting incentives for shareholders to monitor managers, leaving them to run amok with retained earnings. The arguments here support a different explanation, which is that productive long-term investments financed by retained earnings were abandoned when the drop in dividend tax rates made it more attractive for top executives to take the dividends rather than wait for productive investments to generate earned income.
5 An Illustrative Example

The main points can be summarized by offering an example of median-indexed progressive tax reform with respect to two aspects—the brackets and the marginal rates. The two points emphasized here are these: First, tax brackets should be indexed to the median income, to account for both inflation and real growth, and to discourage lobbying by special interests that are not aligned with the common good. Second, the distribution of tax burdens should be progressive over the entire income distribution—including and especially at the top, meaning that the top rate should not set in too low. Table 4 presents a proposal for progressive tax reform consistent with these two points.

Table 4: A Proposal for Progressive Tax Reform

<table>
<thead>
<tr>
<th>Proposed Marginal Tax Rate</th>
<th>Tax Brackets</th>
<th>Average Tax Rate (on Bracket Upper Bound)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Times Median Income</td>
<td>Assuming $51,000 Median</td>
</tr>
<tr>
<td>10%</td>
<td>1.00</td>
<td>51,000</td>
</tr>
<tr>
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<td>7.59</td>
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<td>11.39</td>
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<td>70%</td>
<td>129.75</td>
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<tr>
<td>75%</td>
<td>194.62</td>
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<tr>
<td>80%</td>
<td>291.93</td>
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<tr>
<td>85%</td>
<td>437.89</td>
<td>656.84</td>
</tr>
<tr>
<td>90%</td>
<td>656.84</td>
<td>33,498,883</td>
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</table>

Source: Author’s calculations. 2013 tax rates are based on inflation-adjusted brackets for “married filing jointly” from the Tax Foundation. The figure of $51,000 was roughly the median household income in 2012 before subtracting the standard deduction, personal exemptions, and other deductions.

On other important aspects, see Joel Slemrod’s (2005) “Beautiful Tax Reform.”

21
In this rate structure, the brackets are all multiples of the median income. Namely, the upper bound of the $n$th bracket is given by the median income times $1.5^{(n-1)}$. The base of 1.5 is arbitrary, but it seems to provide reasonable brackets for a first look. The marginal tax rates start at 10 percent and increase in increments of 5 percent. These rates can be scaled to achieve the desired revenue. Dividends are taxed as ordinary income, as they were prior to 2003.

The rates in Table 4 will not appear remarkably high to anyone familiar with historical U.S. rates. From 1955 until 1963, the top marginal rate of 91 percent set in just above $3 million ($3,426,776 in 1955 and $3,001,229 in 1963, in constant 2012 dollars), where the average rate was 78 percent. The average rate was 83 percent on taxable income of $5 million, 88 percent on $15 million, and 90 percent on $50 million. In this context, the proposed rates in Table 4 are comparatively low.

The incentive implications of this proposed structure are summarized in Table 5, using the stylized maximum incentive-compatible ratio $\Delta w^*$. Values of $\Delta w^*$ greater than 2 set in for the top 0.01 percent of the income distribution (around 130 times the median income) and persist past the average recent level of CEO compensation of around $12 million and on up through the upper tail of CEO compensation. Some refinement (such as lengthening the brackets as the marginal rate nears 100 percent) could smooth out $\Delta w^*$ around $25 million and prevent $\Delta w^*$ from falling over higher income levels.

The marginal tax rate that maximizes the revenue collected from top earners is given by $\tau = 1/(1 + a\epsilon)$, where $\epsilon$ is the elasticity of taxable income and $a$ is the ratio $z_m/(z_m - z^*)$, where $z_m$ is the average income in the top bracket and $z^*$ is the income level at which the top rate sets in. In 2012, the 99.9 percent threshold was $1,549,616 and the average income of the top 0.1 percent was $4,660,988; the 99.99 percent threshold was $7,205,236 and the average income of the top 0.01 percent was $21,569,156. In each case, we can calculate $a = 1.50$.

From Saez, Slemrod, and Giertz (2012), the best estimates of the long-run elasticity of taxable income range from 0.40 to 0.12, corresponding to top marginal rates of 62 percent and 85 percent. This range is roughly consistent with the present example, which imposes marginal rates of 55 percent at the 99.9 percent threshold and 75 percent at the 99.99 percent threshold.

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19 See http://www.aflcio.org/Corporate-Watch/Paywatch-2014/100-Highest-Paid-CEOs.
20 See Diamond and Saez (2011) and Saez (2001). With $\epsilon$ defined as $[dz_m/d(1 - \tau)]/[z_m/(1 - \tau)]$, maximization with respect to $\tau$ of $(z_m - z^*)\tau$ involves the first-order condition $z_m - z^* = z_m\epsilon(\tau/(1 - \tau))$, which is equivalent to $\tau = 1/(1 + a\epsilon)$, where $a = z_m/(z_m - z^*)$.
<table>
<thead>
<tr>
<th>Percent Threshold</th>
<th>Income</th>
<th>Average Tax Rate</th>
<th>$\Delta w^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>112,200</td>
<td>14.3</td>
<td>1.18</td>
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<td>95</td>
<td>157,510</td>
<td>17.3</td>
<td>1.22</td>
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<tr>
<td>99</td>
<td>371,689</td>
<td>26.0</td>
<td>1.29</td>
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<tr>
<td>99.5</td>
<td>551,622</td>
<td>30.4</td>
<td>1.33</td>
</tr>
<tr>
<td>99.9</td>
<td>1,549,616</td>
<td>42.7</td>
<td>1.47</td>
</tr>
<tr>
<td>99.99</td>
<td>7,205,236</td>
<td>60.9</td>
<td>2.18</td>
</tr>
<tr>
<td>12,000,000</td>
<td>67.6</td>
<td>3.58</td>
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<td>76.6</td>
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<td>75,000,000</td>
<td>88.3</td>
<td>2.34</td>
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<tr>
<td>100,000,000</td>
<td>90.0</td>
<td>2.00</td>
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</tr>
</tbody>
</table>


To the reasoning that the top rate may as well maximize revenue, because the marginal utility of consumption is vanishingly small for top earners, I have no objection. It is important however that the top rate not set in too low. Imposing a single rate of 73 percent, say, on all income above the 99.9 percent threshold would impose little progressivity on those above the 99.99 percent threshold. For example, if a taxable income of $1,549,616 (at the 99.9 percent threshold) faced an average rate of 45 percent and a (top) marginal rate of 73 percent, then $\Delta w^*$ would be 1.75 at the 99.9 percent threshold, 1.45 at the 99.99 percent threshold of $7,205,236, and 1.42 at $12 million. From 1942 until 1963, $\Delta w^*$ was greater than 2 at the 99.9 and 99.99 percent levels; from 1955 to 1963, it was greater than 3 at the 99.99 percent level (Table 1).

In the extreme tail of the distribution, marginal rates exceeding $1/(1 + \epsilon)$ are indicated to maintain progressivity sufficient to achieve the desired incentive effects. The ideal top marginal rate may be greater than that which would maximize revenue from top earners. Successfully discouraging rent seeking could reduce tax revenue at the top of the distribution without reducing the amount of income effectively redistributed, since the rents no-longer-sought are thus indirectly redistributed.

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22Piketty, Saez, and Stantcheva (2014) derive a higher optimal top rate by decomposing $\epsilon$ into elasticities of real labor supply, tax avoidance, and compensation bargaining. Still, if this higher top rate were to set in too low, it would fail to impose the right incentives.
6 Conclusion

My hope in writing this paper has been to introduce and explain two new mechanisms through which median-indexed progressivity may promote efficiency by aligning private incentives with the common good. I see these mechanisms as being at least as salient as the classical tradeoff between equity and efficiency—and more robust to assumptions about utility functions, the distribution of earning ability, and the correspondence between compensation and social marginal product. I have argued that progressivity can exploit regularities in the way that private and social marginal products often diverge.

It will be for others to judge whether these mechanisms are policy-relevant, but the case can be made under the rubric set out by Peter Diamond and Emmanuel Saez (2011). The policy prescription is obviously implementable from a practical standpoint—one instance is fully laid out above in about half a page. The proposal is essentially similar to the tax system the United States had from about 1942 until 1963 (indexing such a rate structure to the median household income), which was evidently socially acceptable then. The main points should not be overly sensitive to the few modeling assumptions that were made. That these mechanisms operate independently of special assumptions about utility functions and the distribution of earning ability suggests that they are first-order to the problem of optimal taxation.

Future research will need to explore how empirically relevant are choices between socially productive activities and those that are privately rewarding but socially wasteful, and to what extent progressivity in the distribution of tax burdens can influence those choices. To begin, it could be interesting to revisit the empirical literature reviewed by Saez, Slemrod, and Giertz (2012) with the following question in mind: Could the dual findings of a significant taxable-income elasticity and a near-zero labor-supply elasticity reflect not only an inefficient behavioral response to higher and more progressive tax rates (avoidance and evasion) but also an efficient real response: the re-allocation of effort to more socially productive activities that are less privately rewarding in the short-term. It would also be interesting to revisit the analysis by Chetty and Saez (2005, 2010) of the rise in dividend payments following the 2003 tax cuts: asking whether, as Chetty and Saez conclude, these dividends were efficiency-improving (as shareholders were motivated to exert greater control over managers, and compell them to abandon inefficient pet projects) or, as this paper suggests is also plausible, these dividends were paid at the expense of efficient long-term investments.
References


