Taxation of Interest Income

by

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Abstract

Why is interest income taxed so much more heavily than other forms of capital income? This differential tax treatment has generated substantial tax arbitrage, resulting in lower tax revenue, efficiency costs, and apparently net gains to rich borrowers and net losses to poor lenders, together suggesting that this tax treatment makes no sense on welfare grounds.

In examining this argument more formally, this paper reveals two omitted considerations that can help explain the existing tax treatment. First, the forecasted increase in the market interest rate results in a redistribution from rich borrowers to poor lenders. Yet this redistribution comes at no marginal efficiency cost, starting from a situation with no distortions to portfolio choice, so at the margin dominates further redistribution through the income tax.

In addition, information about an individual's portfolio choice reveals information about her earnings *ability*, even controlling for observed labor income, if those who are more able tend to be less risk averse. By making use of this extra information about earnings ability, the tax system can be better tailored to redistribute from able to less able, for any given efficiency cost.

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1. Introduction

Under existing tax law, income from bonds faces a higher effective tax rate than income from virtually any other financial or real asset, since the entire nominal return is fully taxable. The resulting tax arbitrage leads to those in high tax brackets borrowing heavily to buy more lightly taxed assets, while the bonds issued end up being owned by those in lower or zero tax brackets. As documented by Gordon and Slemrod (1988) using U.S. data for 1983, corporations and richer individuals saved enough in taxes on their large net interest deductions to offset essentially all corporate and personal income taxes collected on all other forms of income from capital. At least ignoring implications for the market interest rate, the existing tax treatment of interest income/payments seems to generate not only a large revenue loss and large distortions to portfolios, but also perverse distributional effects, with corporations and the rich saving substantially on taxes through their interest deductions and the poor paying taxes on their positive interest income.

As a result, the existing tax treatment of interest income and payments certainly seems very puzzling. Why is this tax treatment so common across countries, and so stable over time? It is not for lack of proposals to change it.[1]

The objective of this paper is to examine more closely the optimal tax treatment of interest income, to see whether the current tax treatment is as perverse as portrayed above. The intuition we start with, following Atkinson and Stiglitz (1976), is that commodity taxes should provide no net welfare gain when nonlinear income taxes are also available, as long as the utility function is weakly separable between leisure and consumption. In particular, this result suggests that income from savings should not be taxed, since such a tax is equivalent to a commodity tax on future consumption. Following Atkinson and Stiglitz (1976), we examine the welfare effects of including a small fraction of net interest income in the personal tax base, starting from an optimal nonlinear tax on observed labor income.

Contrary to the initial intuition, the model does forecast that net interest income should enter the tax base. The model describes two sources of potential welfare gain from this tax treatment. First, a marginal shift from labor income taxes to taxes on net interest income

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[1] See for example U.S. Treasury (1984), which focused heavily on limiting the amount of tax arbitrage using debt, in part by proposing to tax real rather than nominal interest income.

causes the market-clearing interest rate to rise. Given the observation in the data that the poor are net creditors and the rich net debtors, this rise in the interest rate provides a net transfer from rich to poor. While further such transfers from rich to poor through the income tax come at the price of higher distortion costs sufficient to leave welfare unaffected at the margin, introducing small portfolio distortions provides distributional gains with no marginal efficiency costs.[2]

Second, even conditional on observed labor income, observed bond holdings can well provide information about an individual's underlying ability. By making use of this information, the tax system can better approximate a tax on unobserved ability.[3] Formally, we assume that, for any given observed value for labor income, those who are more able are less risk averse, plausibly because they have a larger reserve of potential earnings available to help absorb losses. As a result, the less able hold more bonds and less equity, everything else equal. While the forecasted result from including net interest income in the tax base is the same type of tax arbitrage seen in the data, the model also implies that the resulting increase in the market interest rate is sufficient that the beneficiaries of this arbitrage are largely the less able lenders, with the most able borrowers left largely unaffected.

2. Taxation of interest income

The economy consists of I individuals, who potentially differ in their assets, their wage rate, their taste for leisure, and their degree of risk aversion. The role of the tax system is to collect revenue in an equitable fashion in order to finance government expenditures. Distorting rather than lump-sum taxes should be used only if they improve the distribution of utilities. By assumption, the more able (those with a higher potential wage rate) are viewed to have higher utility, regardless of the degree to which they spend their potential income on leisure vs. goods. However, the government does not observe ability, only

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[2] See Naito (1999) for a similar result, where small commodity taxes favoring (penalizing) industries employing primarily low (high) skilled workers yield distributional gains through changes in relative wage rates, at the margin with no offsetting efficiency costs.

[3] See Saez (2002) for a more general demonstration that commodity taxes may be appropriate whenever consumption of a good is correlated with the social marginal utility of income at any given level of observed labor income.

labor income. As in Mirrlees (1971), it then designs some nonlinear tax on labor income, trading off the distributional gains with the implied efficiency losses from distortions to labor supply decisions.

Atkinson and Stiglitz (1976) then show that if the utility function is separable between leisure and consumption then there would be no distributional gain yet an efficiency loss from introducing commodity taxes. Given this separability, consumption patterns simply depend on observed labor income, so provide no additional information about underlying ability. Using a narrower tax base, through use of commodity taxes, then introduces additional distortions without any potential distributional gains.

Since future vs. current consumption are examples of different consumption goods, higher tax rates on future vs. current consumption would then be inappropriate. Following this argument, we will ignore general taxes on the return to savings.

Is there a case, though, for including net interest income, at least to some degree, in the personal income tax base? By the Atkinson and Stiglitz (1976) argument, there are no such grounds if an individual's net demand for bonds is simply a function of labor income, since then a tax on labor income provides the same distributional effect without introducing further distortions. However, portfolio choice also depends on an individual's degree of risk aversion. If the degree of risk aversion is correlated with the individual's wage rate, conditional on observed labor income, as we will argue should be expected, then there will be grounds for making use of a tax (or subsidy) on net interest income, in order to better link an individual's tax payments to her underlying ability. Our objective will be to explore the nature of the optimal tax treatment of net interest income.

In order to develop this argument, assume that individual i has financial assets of F_{it} at date t but also receives a flow of potential income equal to $w_{it}T - \tau_t(w_{it}T)$ each period, where T is the maximum time available in a period, w_{it} is individual i's wage rate, and $\tau_t(.)$ represents the nonlinear tax schedule on labor income. For simplicity, we assume that this flow of potential net-of-tax labor income is nonstochastic.[4] If the after-tax real

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[4] Following the labor contracting literature, the firm's equity holders can more cheaply bear the risk from the firm than can its workers, so that the cost of labor to the firm is minimized if workers are provided a nonstochastic wage. While in general, introducing a stochastic wage will introduce computational difficulties, Merton (1990, pp. 147-9) shows that results generalize without substantive changes under

interest rate at date t equals $\theta_{it}r_t$, then the present value of this flow of potential labor income equals

$$H_{it} \equiv \int_{s=t}^{\infty} [w_{is}T - \tau_s(w_{is}T)]e^{-\theta_{is}r_s}ds. \tag{1}$$

Total assets then equal $A_{it} \equiv F_{it} + H_{it}$. The income from these assets will finance the purchase of a vector of consumption goods each period s, where this vector includes leisure as well as goods and services.

The individual can invest the financial assets F_{it} in either equity or bonds, where the return on equity is risky but where for simplicity the return on bonds is riskless. Let the amount of equity purchased be denoted by S_{it} and that of bonds by B_{it}. Implicitly, however, the individual is investing her entire wealth, $A_{it} = F_{it} + H_{it}$, in equity and bonds. While her total equity investments remain equal to S_{it}, her total bond investments implicitly equal $B_{it} + H_{it}$. Let s_{it} (b_{it}) denote the fraction of the total portfolio invested in equity (bonds), so that $s_{it} = S_{it}/A_{it}$ and $b_{it} = 1 - s_{it}$.

Since the aggregate holdings of bonds in the economy are zero (for every lender there is a borrower), we know that $\sum_i F_{it} = \sum_i S_{it}$.[5] Therefore, aggregate equity investments are immediately determined given aggregate financial assets. Our focus, though, will be on the portfolio composition of different investors.

The return on stocks is stochastic, and follows the stochastic process:

$$\frac{dS}{S} = g_t dt + \sigma dz,$$

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particular assumptions. In particular, the present value of future labor income is simply replaced by the discounted present value of the certainty-equivalent of future labor income. In addition, if the random process in labor income is correlated with the random return on some financial assets, these financial assets can be used as a hedge, altering portfolio choice accordingly. Such an added link between portfolio choice and observed labor income would not introduce any qualitative change to our analysis, however, since the link with unobserved ability would remain present.

[5] We implicitly assume here that all borrowers and lenders are individuals, so ignore both government borrowing and firm borrowing. Including these additional forms of borrowing would require modeling how the amount of government and firm borrowing changes in response to changes in the tax treatment for individuals, and the resulting change in market interest rates. Corporate borrowing incentives would remain unaffected, though, if the corporate tax rate equals τ'_{wt}, as defined below, so that a firm's after-tax interest rate remains unaffected. The government's cost of borrowing remains unaffected as well if the average tax rate faced on the additional bond holdings again equals τ'_{wt}. The pattern of these additional bond holdings depend on who bears the added taxes in the future to repay this debt. While some changes in firm and government incentives, so in their behavior, are inevitable, the qualitative results in the paper would remain unaffected.

where g is the expected return on equity, dt captures any nonstochastic time trends and dz represents continuous Brownian motion with standard deviation σ. Within the model, the return on equity is untaxed. Our focus will be on the desired tax treatment of interest income/payments.[6] To begin with, however, we should note that a uniform tax rate on both interest income and interest payments collects zero revenue and has no effect on incentives. Since the aggregate supply of bonds to the economy is zero, aggregate interest income and aggregate interest payments are equal in size, so that revenue from taxes on interest income would be exactly offset by the revenue loss from interest deductions. In addition, the pretax interest rate would adjust so that the after-tax interest rate is unaffected by the tax for all individuals.

Following current tax provisions, however, we assume that the potential tax rate on net interest income is proportional to the individual's marginal tax rate on labor income. In particular, consider letting the individual's actual income tax payments equal $\tau_t(w_{it}h_{it} + \mu_t r_t B_{it})$, where h_{it} equals actual hours of work. The resulting net-of-tax marginal interest rate faced by individual i is then $(1 - \mu_t \tau_{it}')r_t$, so that by assumption $\theta_{it} = (1 - \mu_t \tau_{it}')$. The rate of return on bonds is assumed to be nonstochastic, and then equals

$$\frac{dB}{B} = \theta_{it} r_t dt.$$

Our focus will be on whether the optimal μ_t is nonzero, and if so its optimal sign.

For simplicity, we will ignore the general equilibrium effects of a change in capital investment on factor and consumer prices by assuming a linear technology. The wage rate at a given skill level will be the numeraire, and all skill levels are assumed to be perfect substitutes.[7] Given this linear technology and the fixed wage rates, the return to equity remains fixed as well.

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[6] More generally, our focus is on the *differential* tax treatment of debt and equity. In particular, a uniform tax on all asset income will not distort portfolios. (This assumes that the risk transferred to the government through random tax payments is ultimately returned to shareholders. See Gordon (1985) for further discussion.) By normalizing taxes on equity income to zero, we will examine whether taxes on debt should be nonzero.

[7] Without this assumption, various other supplementary taxes/subsidies can be justified. See Naito (1999) for further discussion.

Denote the rate of consumption expenditures (on leisure as well as goods and services) at time t by consumer i by C_{it}. This consumer's indirect utility from the flow of consumption at date t is denoted by $V(C_{it}; w_{it}, \mathbf{p}_t)$, where $\mathbf{p}_t$ represents the vector of consumer prices. Specifically, assume that

$$V(C_{it}; w_{it}, \mathbf{p}_t) = f(w_{it}, \mathbf{p}_t) \frac{C_{it}^{1-\gamma_i}}{1 - \gamma_i}, \tag{2}$$

where γ_i represents the coefficient of relative risk aversion, and where $\gamma_i > 0$ to capture risk aversion. The present value of expected utility equals

$$W_{it} = \mathrm{E}_0 \int_{s=t}^{\infty} e^{-\rho(s-t)} V(C_{is}; w_{is}, \mathbf{p}_s) ds, \tag{3}$$

where ρ is the individual's utility discount rate.

Formally, we will assume that individuals differ in their degree of risk aversion, and that those with higher values of lifetime potential labor income tend to have a lower value of γ_i. However, this utility function can be taken to be a local approximation to a more general function, shared by individuals, in which the degree of risk aversion is itself a declining function of the individual's value of C_{it}.

Individuals choose their portfolio allocation at each point in time as well as their consumption rate to maximize their expected utility as defined in equation (3). By Ito's lemma, we can take a second-order Taylor approximation of an individual's utility, so that the optimization problem can be reexpressed as[8]

$$W_{it} = \max_{\{C,b,s\}} E_0 \Big\{ W_{it} + V(C_{it}; w_{it}, \mathbf{p}_t) - \rho W(A_{it}) + W'(A_{it}) dA_{it} + .5 W''(A_{it}) dA_{it}^2 \Big\}. \tag{4}$$

Here, dA_{it} represents the change in the individual's real wealth over time. Decisions are made subject to the individual's budget constraint that $b_{it} + s_{it} = 1$.

At any interior optimum for portfolios, increasing s_{it} and decreasing b_{it} to compensate has no effect on utility at the margin, implying that[9]

$$g_t - \theta_{it} r_t = \gamma_i s_{it} \sigma^2, \tag{5}$$

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[8] We follow closely here the derivation used in Merton (1990).

[9] We make use of a standard result here that $A W''(A)/W'(A) = -\gamma_i$ in the equilibrium to such a model.

yielding a conventional expression for the risk premium on equity. Therefore, s_{it} varies across individuals only to the extent that θ_{it} or γ_i varies. In particular, s_{it} takes on a high value for those with low values of θ_{it} and/or γ_i.

Consider first the outcome with $\mu_t = 0$, and so $\theta_{it} = 1$. We will then explore how welfare changes as the government deviates from this choice.

If $\mu_t = 0$ *and* if all individuals have the same γ_i, then the model forecasts that all individuals have the same fraction, s, of their overall assets A_{it} invested in equity. With $S_{it}/A_{it} = s$, we infer that[10]

$$\frac{S_{it}}{F_{it}} = s\left(1 + \frac{H_{it}}{F_{it}}\right),\tag{6}$$

and

$$\frac{B_{it}}{F_{it}} = (1 - s) - s\frac{H_{it}}{F_{it}}.\tag{7}$$

In particular, those with high potential future earnings relative to their financial assets will have a higher fraction of their financial assets invested in equity, and therefore a lower fraction invested in bonds. Those with a relatively high value of H_{it}/F_{it} will therefore be in debt while those with a relatively low value of H_{it}/F_{it} will have positive bond holdings. Not surprisingly, the young will therefore be in debt, since their current financial assets are small relative to their human capital.[11] The old, in contrast, normally have substantial financial assets, yet the present value of their future labor earnings (plus pension income) will be relatively small, so they will be net lenders.

Even if γ_i is the same for all individuals, note that the size of s_{it} (and b_{it}) conveys information about potential labor income, H_{it}, at least after controlling for the individual's age and the size of current financial assets. In particular, those with high potential labor income will hold more equity and less debt. If the high skilled also have a lower γ_i, as we assume, this relationship is only strengthened.

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[10] Since $\sum_i B_{it} = 0$, market prices must adjust so that $s\sum_i H_{it} = (1 - s)\sum_i F_{it}$. As a result, we infer that $0 < s < 1$.

[11] We have assumed perfect capital markets, however. If, due to adverse selection reasons, the bond market works poorly, then young borrowers will face credit constraints. In this case, subsidies to loans can be appropriate on efficiency grounds.

Allowing for such variation in γ_i across individuals seems essential in order to make sense of the data on portfolio choice. At least U.S. data[12] suggest that the rich tend to be large net debtors, while the poor hold a much larger fraction of their financial portfolios in bonds.[13] Without variation in γ_i, equations (6) and (7) imply that this can occur only if those with high observed labor income tend to have higher values of H_{it}/F_{it}, at any given age. Yet observed labor income, as a fraction of assets, if anything is lower for the rich than the poor — financial assets are distributed much more unequally than labor income. That H_{it} consists of the present value of observed labor income *plus* the present value of leisure implies that the skilled could still have a higher ratio H_{it}/F_{it} if they consumed enough more leisure relative to the poor. Yet hours of work do not seem to vary much with the wage rate, while the age of retirement if anything is later for those with high wage rates. If the rich are enough less risk averse, however, then we can make sense of observed portfolio choices.

We have assumed in addition, however, that the degree of risk aversion depends not on observed labor income but on *potential* labor income. This is consistent, for example, with equity holdings being higher for the educated, even conditional on observed labor income.[14]

Consider now whether, starting from $\mu_t = 0$, the government would want to raise μ_t. To address this question, we first need to assume some explicit objective function for the government. In particular, assume that at each date the government chooses μ_t and the function $\tau(.)$ to maximize

$$\max_{\mu_t,\tau} \sum_i \left[\int_{s=t}^{\infty} e^{-\rho s} V(C_{is}; w_{is}, \mathbf{p}_s) ds + \lambda \int_{s=t}^{\infty} e^{-r_s s} \tau_s(w_{is} h_{is} + \mu_s r_s B_{is}) ds \right],$$

[12] See, for example, the figures in Gordon and Slemrod (1988). Their figures do not control for age. However, the rich inevitably would tend to be older than the poor, so should have been net lenders for this reason if in fact γ_i were the same for everyone.

[13] Until recently, only a small fraction of individuals (primarily the rich) had *any* equity holdings.

[14] For some empirical support for this relationship, see Poterba and Samwick (forthcoming). While they do not control for an individual's wage rate, they do find that more educated individuals hold more equity, even after controlling for a flexible function of both current income (in part as a proxy for tax incentives) and current wealth.

where λ is the weight put on government revenue.[15]

Starting from $\mu_t = 0$, a marginal increase in μ_t raises welfare if[16]

$$\sum_i \int_s (V'_{is} - \lambda) B_{is} \frac{\partial r_s}{\partial \mu_t} ds > \sum_i (V'_{it} - \lambda) \tau'_{it} r_t B_{it} - \lambda \sum_i \int_s e^{-r_s s} \tau'_{is} w_{is} \frac{\partial h_{is}}{\partial \mu_t} ds. \quad (8)$$

Following Saez (2002), consider the impact instead of modifying the structure of the income tax so as to impose the same average tax change on those with each value of labor income, $z \equiv wh$, as occurs when μ_t changes. In particular, consider the impact of the set of tax changes $d\tau(z) = \tau'(z) r_t \bar{B}(z)$, where $\bar{B}(z)$ is the average value of B_{it} among those with labor income equal to z. Since the nonlinear income tax schedule has simultaneously been chosen to maximize social welfare, we know that these changes in the tax schedule have no net impact on welfare, implying that[17]

$$\sum_i \int_s (V'_{is} - \lambda) B_{is} \frac{\partial r_s}{\partial \tau_t} ds = \sum_i (V'_{it} - \lambda) \tau'_{it} r_t \bar{B}(z) - \lambda \sum_i \int_s e^{-r_s s} \tau'_{is} w_{is} \frac{\partial h_{is}}{\partial \tau_t} ds. \quad (9)$$

Subtracting equation (9) from equation (8), we find that the optimal μ_t is positive if

$$\sum_i \int_s (V'_{is} - \lambda)(B_{is} - \bar{B}(z)) \left(\frac{\partial r_s}{\partial \mu_t} - \frac{\partial r_s}{\partial \tau_t} \right) ds - \sum_i (V'_{it} - \lambda) \tau'_{it} r_t (B_{it} - \bar{B}(z))$$

$$+ \sum_i \int_s (V'_{is} - \lambda) \bar{B}(z) \left(\frac{\partial r_s}{\partial \mu_t} - \frac{\partial r_s}{\partial \tau_t} \right) ds > -\lambda \sum_i \int_s e^{-r_s s} \tau'_{is} w_{is} \left(\frac{\partial h_{is}}{\partial \mu_t} - \frac{\partial h_{is}}{\partial \tau_s} \right) ds, \quad (10)$$

or equivalently if

$$\int_s \sum_z \text{cov}(V'_{is}, B_{is} | z) \frac{\partial r_s^n(z_i)}{\partial R} ds + \sum_i \int_s (V'_{is} - \lambda) \bar{B}(z) \frac{\partial r_s}{\partial R} ds > -\lambda \sum_i \int_s e^{-r_s s} \tau'_{is} w_{is} \frac{\partial h_{is}}{\partial R} ds. \quad (11)$$

Here, R is a shorthand for the combined policy changes in μ_t and τ_t, and $r_s^n(z_i) = r_s(1 - \mu_s \tau'(z_i))$.

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[15] Here, λ implicitly measures the utility gain from the goods and transfer payments financed out of the tax revenue.

[16] By the envelope theorem, the effect of the tax change on utility consists of the changes in after-tax income at each date, holding behavior unchanged, times marginal utility at that date. In addition, note that $\sum_i \lambda B_{it} = 0$, since $\sum_i B_{it} = 0$.

[17] Here, the derivatives with respect to τ is a shorthand for the effects of the change in the full schedule for τ.

In the setting of Atkinson and Stiglitz (1976), these combined tax changes would have no net effect on labor supply, so that the right-hand side of equation (11) would equal zero. In addition, given the separability they assume between leisure and consumption, B_{it} simply depends on z, so that the covariance term on the left-hand size equals zero. Their paper does not consider general equilibrium price effects, so that the second term on the left-hand side is ignored. As a result, the optimal μ_t would equal zero.

The setting here is more general than that considered by Atkinson and Stiglitz. To begin with, leisure is a function of time, rather than a scalar. In addition, even if the underlying direct utility function at each date in our model is weakly separable between leisure and consumption, the overall utility function is not in general separable between leisure and consumption. We also allow for both heterogeneity in tastes and general equilibrium price changes.

What then can be said about whether the inequality in equation (11) holds? Consider first the effects of these combined tax changes on labor supply. In general, labor supply can certainly change in response to such a tax reform, and in different directions for net lenders and net borrowers, and differently at different dates. However, it is difficult to say anything in general about the sign of the resulting effect on government revenue. Given the empirical evidence of low elasticities of labor supply, combined with the result in Atkinson and Stiglitz that this term is precisely zero in their setting, we presume that this term will be small relative to the other terms. Any later results, however, must be qualified by the ambiguity concerning the size (and sign) of this term.

Much more can be said about the other two terms. In the first term on the left-hand side, the covariance describes the degree to which observed bond holdings provide information about an individual's underlying ability, even given their observed labor income. If the covariance is nonzero, then this information can be used to redesign the tax structure to better approximate a tax on unobserved ability.[18] Given the assumptions of our model, the more able are less risk-averse, so everything else equal invest less in bonds (or borrow more). In addition, given observed labor income, the more able have higher potential income so by equation (7) would hold fewer bonds. As a result, this covariance term should

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[18] Saez (2002) has made this point in a more general context.

be positive for all values of z. Aiding net lenders at the expense of net borrowers would then imply transfers from the more able to the less able, conditional on observed labor income. The question then is what tax treatment of net interest income accomplishes this. If the $\partial r_s^n(z_i)/\partial R$ are mostly positive, then this effect provides support for taxing net interest income.

The second term describes the impact on welfare arising from any changes in the market interest rate, even ignoring any heterogeneity in households conditional on observed labor income. If those with low observed income tend to be net lenders and those with high income net borrowers, then an increase in the market interest rate is a distributional gain. Starting from $\mu_t = 0$, introducing portfolio distortions has no efficiency cost at the margin (ignoring impacts on labor supply), so that the resulting changes in the interest rate can provide distributional gains with no offsetting efficiency costs. In contrast, further use of the income tax to redistribute from rich to poor implies offsetting efficiency costs that are large enough starting from the optimal tax structure to yield no net gain.[19] If $\partial r_s/\partial R > 0$, then this term provides support for taxing interest income.

To proceed further, we need information about the signs of $\partial r_s/\partial R$ and $\partial r_s^n(z_i)/\partial R$. If we divide equation (5) through by $\gamma_i \sigma^2$, weight by A_{is} and sum over i, we find that

$$\sum_i \left[\frac{A_{is}g - (1 - \mu_s \tau'_{is})r_s A_{is}}{\gamma_i \sigma^2} \right] = \sum_i S_{is} = \sum_i F_{is}. \tag{12}$$

Consider first the impact of the policy changes on interest rates at date t, where the A_{it} are fixed based on past savings decisions. Changes in τ'_t at this date have no impact on r_t, when evaluated at $\mu_t = 0$. What about $\partial r_t/\partial \mu_t$? If we differentiate the market-clearing condition (12) at date t with respect to μ_t and evaluate at $\mu_t = 0$, we find that

$$\frac{1}{r_t} \frac{\partial r_t}{\partial \mu_t} = \frac{\sum_i \tau'_{it} A_{it}/\gamma_i}{\sum_i A_{it}/\gamma_i}. \tag{13}$$

This expression is a weighted average of the τ'_{it}, with the rich and the less risk averse getting more weight. As a result, this weighted average tax rate should be close to the top marginal tax rate. Denote this weighted average tax rate by τ'_{wt}.

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[19] This is just the intuition developed in Naito (1999) in a different context.

Since $0 < \tau'_{wt} < 1$, it immediately follows that $\partial r_t / \partial \mu_t > 0$. Therefore the second term in equation (11) at date t is positive.

What about $\partial r^n_t(z_i) / \partial \mu_t$, evaluated at $\mu_t = 0$? Since by definition $r^n_t(z_i) = (1 - \mu_t \tau'_{it}) r_t$, we find that $\partial r^n_t(z_i) / \partial \mu_t = (\tau'_{wt} - \tau'_{it}) r_t$. Therefore, $\partial r^n_t(z_i) / \partial \mu_t > 0$ for all investors with $\tau'_{it} < \tau'_{wt}$, and conversely. Given that τ'_{wt} should be close to the top marginal tax rate, we infer that $\partial r^n_{it} / \partial \mu_t$ is positive except for the richest individuals; almost all investors should face an increased after-tax interest rate, and more so the lower the τ'_{it} they face, when net interest income is made taxable/tax deductible.

As a result, unless the covariance in the first term on the left-hand side of equation (11) is much larger for those with high observed labor income than for other individuals,[20] this first term at date t is also positive.

What about changes in interest rates at future dates? The only potential impact on future interest rates of policy changes at date t arises from changes in savings, so in the A_{is} caused by these combined tax changes. These impacts, arising from a marginal tax change during a brief time period dt are necessarily of second order. We can therefore ignore them.

Together, these results imply that the optimal value of μ_t is in fact positive, consistent with observed tax structures. Evaluated at $\mu_t = 0$, there are no marginal efficiency costs due to portfolio distortions arising from a marginal change in μ_t, since portfolios are allocated efficiently when $\mu_t = 0$. As μ_t increases, portfolio distortions and the resulting efficiency losses grow. At the optimal value of μ_t, these marginal efficiency losses just offset the marginal distributional gains from including an additional fraction of net interest income in the tax base. In particular, at the optimal value of μ_t,[21]

$$\sum_i \left(\tau_{it} r_t + \mu_t \frac{\partial r_t}{\partial \mu_t} \right) B_{it} (\lambda - V'_{it}) + \sum_i V'_{it} B_{it} \frac{\partial r_t}{\partial \mu_t} = -\lambda \sum_i \mu_t \tau'_{it} r_t \frac{\partial B_{it}}{\partial \mu_t}.$$

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[20] This covariance equals the correlation between V'_{it} and B_{it} times the standard deviations of both B_{it} and V'_{it}. There is no reason to expect the size of the correlation to differ systematically with ability level. While the standard deviation of B_{it} should be an increasing function of income, the standard deviation of V'_{it} should plausibly be much larger among those with low reported labor income. As a result, there is no clear presumption about how the size of this covariance varies across income levels.

[21] For simplicity of notation, we ignore here the feedback onto labor supply.

The right-hand side of this equation measures the marginal efficiency (and revenue) loss from increasing the fraction of net interest income included in the tax base. As emphasized for example in Gordon and Slemrod (1988), the revenue loss from the resulting tax arbitrage can be very large. At the margin, the loss from increased arbitrage as μ_t increases just offsets the gains described above.[22]

3. Conclusions

Why is interest income taxed so much more heavily than other forms of capital income? This differential tax treatment of bonds vs. other assets has generated substantial use of debt to reduce overall tax payments, through the rich borrowing from the poor to invest in more lightly taxed assets. The result is substantially lower tax revenue, sizable efficiency costs, and apparently net gains to rich borrowers and net losses to poor lenders, together suggesting that this tax treatment makes no sense on welfare grounds.

We reexamine this argument more formally, and find that taxes on net interest income can well be justified within an optimal tax framework. To begin with, the forecasted increase in the market interest rate results in a redistribution from rich borrowers to poor lenders. Yet this redistribution comes at no marginal efficiency cost, starting from a situation with no distortions to portfolio choice, so at the margin dominates further redistribution through the income tax.

In addition, information about an individual's portfolio choice can potentially reveal information about her earnings *ability*, even controlling for observed labor income. We presume that those with higher potential income will be less risk averse, and so invest relatively more heavily in equity than those with lower potential income, even holdings observed income fixed. By making use of this extra information about earnings ability, the tax system can be better tailored to redistribute from able to less able, for any given efficiency cost. Given the sizable forecasted increase in the market interest rate in response to a tax on net interest income, this tax does aid low-ability lenders at the expense of more able borrowers.

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[22] Note, however, that at higher values of μ_t portfolios become more unequal, with the rich borrowing more and the poor lending more. This implies that the marginal distributional gains also grow as μ_t increases.

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