How should we tax capital? Interaction between capital taxes and saving motives*

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Abstract

This paper presents a simple theoretical model that highlights the differences between capital income taxes and wealth taxes. The focus is on a distinction between two asset classes. One asset class provides financial returns whereas the other asset class provides flow utility to its owners. In this setting, both capital income taxes and wealth taxes discourage saving. Moreover, capital income taxes distort the portfolio composition of individuals. With preference heterogeneity, the optimal capital taxes are non-zero. Depending on the nature of preference heterogeneity, either the optimal capital income taxes may be non-zero, the optimal wealth taxes may be non-zero, or both.

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1 Introduction

Capital income taxes and wealth taxes have been subjects of debate among economists and policy-makers for years. While both types of taxes aim to redistribute wealth and reduce inequality, they differ in their approach and implementation. Capital income taxes are levied on the returns generated from investments and other capital assets, while wealth taxes are typically imposed on the net worth of an individual or household.

Capital income taxes and wealth taxes are equivalent ways of taxing capital in most economic models. Assuming that the return of capital is homogeneous among individuals, then a capital income tax regime can be implemented using wealth taxes and vice versa. However, there are several studies that show the assumption of homogeneous returns is not secure. For example, Fagereng et al. (2020) show using Norwegian data that the returns from investments are correlated with the wealth of investors. Moreover, Bach et al. (2020) find that the heterogeneity in returns is the main driver of the recent increase in the top wealth shares in Sweden. Therefore, it is crucial to understand the similarities and differences between these two ways of taxing capital from various angles and how they differ in terms of policy-making perspective.

One of the most important reasons for heterogeneous returns is the differences in portfolio composition. For example, Korteweg et al. (2015) calculate the return of resold paintings and show that the risk-adjusted return of art pieces is much lower than that of the stock market in the same period. This raises the question of why people would buy or invest in assets that have much lower returns, even when accounting for the higher risk that comes with assets with higher returns.

One possible answer to this question could be the flow utility that is attached to the assets with lower returns. In other words, people could save not only to restore value or earn financial returns but also to have the joy of ownership. If this is the case, it may be rational for people to buy some assets despite their lower returns, because they would receive a flow utility during their ownership of these assets.

In this paper, I present a simple and tractable model that combines individuals who save for different reasons and a government that uses various ways to tax capital – namely capital income taxes and wealth taxes. Importantly, the model includes a wealth-in-the-utility term to capture the preference of investors toward assets with lower returns.

Then, I try to explain the differences between capital income taxes and wealth taxes in terms of their effect on individual saving behavior. I show that capital income taxes create a distortion between different asset classes with different returns. Then, I describe a hypothetical policy change that abolishes capital income taxes and introduces wealth taxes. As a result of this reform, individuals are discouraged to save using assets with

lower returns.

Second, I turn to the government's side and solve for the optimal tax rates on capital income and wealth. With homogeneous utility and weak separability of labor, the Atkinson-Stiglitz theorem applies, and both tax rates are zero at the optimum. Then, I make some conjectures about the optimal tax rates in cases of different types of preference heterogeneity. I argue that either the capital income tax rate or the wealth tax rate or both should be non-zero at the optimum depending on the type of preference heterogeneity.

This paper relates to three major strands of the literature. The first is about the question of whether the capital should be taxed. Early papers concluded that capital should not be taxed. (Atkinson and Stiglitz, 1976; Judd, 1985; Chamley, 1986). However, there are many papers that show that it may be optimal to tax capital due to various reasons. These reasons include but are not limited to incomplete insurance markets (Conesa et al., 2009), multi-dimensional heterogeneity (Piketty and Saez, 2013), and preference heterogeneity (Diamond and Spinnewijn, 2011; Ferey et al., 2022).

Second, there is a recent emerging literature that compares and contrasts capital income taxes with wealth taxes, however, the results are inconclusive. In similar structural macroeconomic models, Guvenen et al. (2022b) show that using wealth taxes instead of capital income taxes could be desirable due to efficient capital reallocation whereas Boar and Midrigan (2022) show that capital income taxes could be desirable due to lower inequality. Guvenen et al. (2022a) try to answer this question theoretically with heterogeneous entrepreneurial productivity.

Third is the literature on the determinants of household portfolio composition. Jordà et al. (2019) documents the differences in returns to different assets and Kuhn et al. (2020) stress the importance of household portfolio composition for wealth dynamics and inequality.

2 Household saving behavior

In this section, I will present a simple model to analyze the effect of capital income taxes and wealth taxes on household saving behavior. Assume that the economy consists of a continuum of individuals of mass one. They live for two periods. Individuals differ in terms of their labor productivity, θ^i. The distribution of labor productivity is given by the cumulative distribution function $F(\theta)$.

In the first period, individuals decide how much to work given their labor productivity. Providing labor effort is costly for individuals. A non-linear income tax $T(\cdot)$ is imposed on earnings. Individuals consume part of their net earnings and save the rest. There are two types of assets that individuals can utilize to save. The first asset is the return asset denoted by a_R. The return asset brings financial returns with an exogenous

interest rate. The second asset is the utility asset denoted by a_U. This asset does not deliver any financial returns but individuals derive utility from owning the utility asset. There are no mortality, earnings, or return risks in the model. The individual utility is given by

$$U(c_1, c_2, a, w; \theta^i) = u(c_1) + \beta u(c_2) + \phi(a_U) - v\left(\frac{y}{\theta^i}\right),$$

where $u(c_1)$ and $u(c_2)$ are the utility from consumption in periods one and two respectively. The utility function $u(\cdot)$ is increasing and concave. β denotes the time discount rate. $\phi(a_U)$ is the utility derived from the utility asset. Similar to the consumption utility function, the function $\phi(\cdot)$ is also increasing and concave. $v\left(y/\theta^i\right)$ is the cost of earning y for an individual with labor productivity θ^i.

In the second period, individuals consume all their assets and their returns net of taxes. In particular, they can consume their return asset and its returns, as well as the entirety of their utility asset. The government levies two types of taxes on capital. First, individuals pay capital income tax τ_k from the returns they gain from the return assets. Second, they pay wealth tax τ_w from their total assets and returns. The capital income tax payment is deducted from the wealth tax liability to avoid double taxation of returns. Each individual solves the following problem to maximize their utility subject to their budget constraints for periods one and two.

$$\begin{aligned} \max_{y, c_1, c_2, a_R, a_U} \quad & U(c_1, c_2, a, w; \theta^i), \\ \text{s. t.} \quad & c_1 = y - T(y) - a_R - a_U \\ & c_2 = (1 - \tau_w)[a_R(1 + (1 - \tau_k)r) + a_U]. \end{aligned} \tag{1}$$

Individuals make three decisions. First, they decide how much they earn given their labor productivity and income taxes. Second, they decide how much they save for the second period. Third, they decide on the composition of their saving, that is, how much they save using the return asset and the utility asset.

The first order conditions for earnings (y), returns assets (a_R), and utility assets (a_U) is given by

$$[1 - T'(y)]u'(c_1) = v'\left(\frac{y}{\theta^i}\right)\frac{1}{\theta^i} \tag{2}$$

$$u'(c_1) = \beta u'(c_2)[(1 - \tau_w)(1 + (1 - \tau_k)r)] \tag{3}$$

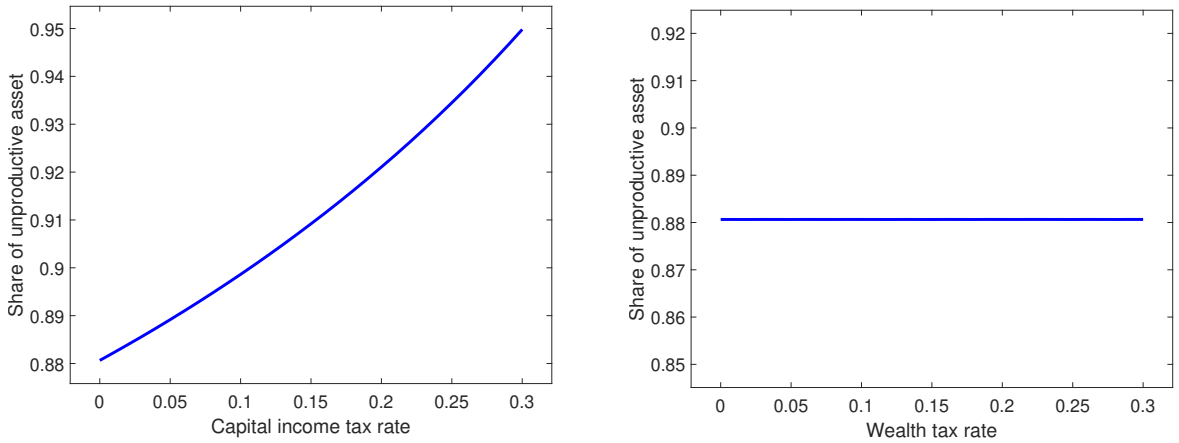
$$u'(c_1) = \phi'(w) + \beta u'(c_2)[1 - \tau_w], \tag{4}$$

respectively.

The first condition with respect to earning states that individuals balance the marginal benefit of working with its marginal cost. In other words, the increase in

utility thanks to an increase in earnings should be equal to the decrease in utility due to the increase in effort. The second condition with respect to the return asset states that the saving decision should be made so that the utility is maximized inter-temporally. The third condition with respect to the utility asset combines the inter-temporal maximization with the utility from savings.

Looking at the optimality conditions, it is clear that capital income taxes and wealth taxes are not equivalent, even though all individuals have the same preferences and there is no return risk. The net-of-wealth-tax rate appears in Equations (3) and (4) whereas the net-of-capital-income-tax rate appears only in Equation (3). This means wealth taxes distort both return and utility asset decisions whereas capital income taxes distort only the return asset decision. This can also be confirmed with a simple numerical exercise.



(a) Capital income tax

(b) Wealth tax

Figure 1: The effect of capital taxes on portfolio composition

Figure 1 shows how the optimal share of the utility (unproductive) asset changes when tax rates change. The left panel is for the change in the capital income tax rate whereas the right panel is for the change in the wealth tax rate. Figure 1a shows that the share of the utility asset increases when the capital income tax increases, meaning that capital income taxes distort the choice for the return asset more. Figure 1b shows that the share stays constant when the wealth tax increases. This is because wealth taxes distort both types of assets.

If the optimality conditions for the return asset and the utility asset are combined, it yields

$$\phi'(w) = \beta r(1 - \tau_w)(1 - \tau_k)u'(c_2). \tag{5}$$

Equation (5) governs the portfolio choice of individuals. It balances out the benefits of two different assets at the margin. When individuals decide between the utility asset and the return asset, the increase in utility from the utility asset (left-hand side) and the increase in consumption in the second period from the financial returns of the return

asset (right-hand side) need to be balanced.

Using Equation (5), one can contemplate a hypothetical tax reform, namely a switch from a regime in which only capital income taxes exist, to a regime with only wealth taxes. The nature of this reform resembles the reforms analyzed by Guvenen et al. (2022b) and Boar and Midrigan (2022). There are various metrics that could be targeted by this reform. One could think about a revenue-neutral reform, or a reform that keeps the total amount of savings constant, or even a reform that replaces the capital income tax with a wealth tax keeping the rate constant. In a two-period setting, the last reform is not entirely out of question.

For the sake of argument, assume that the reform is conducted in a way that individuals save the same amount of the return asset. The way to ensure this is to carefully consider the optimality condition for the return asset. A wealth tax rate that satisfies $\tau_w = \frac{r\tau_k}{1+r}$ ensures that the same amount of the return assets is optimal for individuals before and after the reform. However, looking at the optimal portfolio choice condition in Equation (5), tells us that a decrease in the utility asset is desirable as a result of the switch from capital income taxes to wealth taxes.

The result of the reform in this setting is similar to the increase in quality capital as a result of the use-it-or-lose-it effect as argued by Guvenen et al. (2022b). As a result of a switch from capital income taxes to wealth taxes, the total amount of return per capital increases. However, the channel is entirely different. In their model, the average return rate increases because of efficient capital reallocation. That is, wealth taxes reallocate capital towards productive entrepreneurs who are able to earn higher returns from their capital. In the setting of this paper, no capital reallocation is necessary. The average return rate increases because individuals adjust their portfolio toward an asset that brings returns instead of an asset that brings utility.

3 Optimal tax rates

In this section, we will take a look at what the optimal tax rates for both types of capital taxes could look like. Assume that the government's objective is to maximize weighted utilitarian welfare. The instruments that the government has are a non-linear income tax on earnings in the first period, a linear capital income tax on returns of the return asset, and a linear wealth tax on the net worth of individuals at the beginning of the

second period. Formally, the government's optimization problem can be written as

$$\begin{aligned} \max_{T(\cdot),\tau_k,\tau_w} \quad & \Omega = \int_{\underline{\theta}}^{\overline{\theta}} V(T(\cdot),\tau_k,\tau_w;\theta)\tilde{f}(\theta)d\theta \\ \text{s. t.} \quad & \int_{\underline{\theta}}^{\overline{\theta}} [\mathcal{R}_y(\theta)+\mathcal{R}_k(\theta)+\mathcal{R}_w(\theta)]f(\theta)d\theta > 0 \\ & V(T(\cdot),\tau_k,\tau_w;\theta) = \arg\max_{y,a,w} U(c_1,c_2,a,w;\theta^i). \end{aligned}$$

where $V(T(\cdot),\tau_k,\tau_w;\theta)$ is the indirect utility of individual with labor productivity θ and $\tilde{f}(\theta)$ are exogenous Pareto weights. $\mathcal{R}_y(\theta)$, $\mathcal{R}_k(\theta)$, and $\mathcal{R}_w(\theta)$ are government's tax revenues from income taxes, capital income taxes, and wealth taxes respectively. The government's exogenous spending is set to zero without loss of generality. The last constraint ensures that the government takes individual optimal choices into account.

If individual preferences are homogeneous, then the Atkinson-Stiglitz theorem applies. A government that wants to redistribute between individuals with different labor productivity, such as the one in this setting, cannot obtain any extra information by observing individual saving patterns (Atkinson and Stiglitz, 1976). In this case, the government should not distort the inter-temporal choice of individuals and the demand for the utility asset. This means that the optimal tax rates on both capital income and wealth are zero.

If there is preference heterogeneity, Ferey et al. (2022) shows that there is a scope for taxing capital. However, in a setting where there is more than one type of capital (return asset and utility asset) and more than one type of capital tax (capital income tax and wealth tax), the nature of preference heterogeneity is crucial when determining the optimal tax rates.

Assume that individuals differ in terms of their time preference β^i and it is correlated with their labor productivity θ^i. If this is the case, individuals with different labor productivity will have different consumption patterns between periods as well, even if they have the same earnings. Here, it has to be kept in mind that capital income taxes distort only the saving of the return asset whereas wealth taxes distort the saving of both types of assets. Therefore, it is expected that the government uses wealth taxes to increase redistribution when the extra information is concerning both types of assets. If more productive individuals are more (less) patient, then wealth taxes are expected to be positive (negative). Capital income taxes that create a wedge between different types of assets are expected to be zero in this case.

Now, assume that individuals differ in terms of their taste for the utility asset $\phi^i(\cdot)$ and it is correlated with their labor productivity θ^i. In this case, the portfolio composition of individuals will provide extra information for the government. Therefore,

capital income taxes that distort the portfolio composition of individuals are expected to be non-zero. However, capital income taxes also distort the inter-temporal decision of individuals. This distortion is expected to be rectified with the use of wealth taxes at the optimum. Therefore, we expect the sign of capital income taxes and wealth taxes to be opposite. If more productive individuals have a higher (lower) taste for the utility asset, then capital income taxes are expected to be negative (positive) and wealth taxes are expected to be positive (negative) to rectify the inter-temporal decision.

4 Conclusion

Capital income taxes and wealth taxes are not completely equivalent in all circumstances. In particular, they differ substantially if the return of capital is not homogeneous. Moreover, people save for different reasons, such as to restore value, earn financial returns, and have the joy of ownership. These different reasons could rationalize investing in assets with lower returns.

In this paper, I explain how capital income taxes and wealth taxes affect the overall level of savings and the portfolio composition of individuals. Both types of taxes discourage saving. Moreover, capital income taxes distort the portfolio composition. Then, I make some conjectures about the optimal tax rates on capital income and on wealth in cases with preference heterogeneity. Depending on the nature of preference heterogeneity, none of, either, or both capital income taxes and wealth taxes may be desirable.

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