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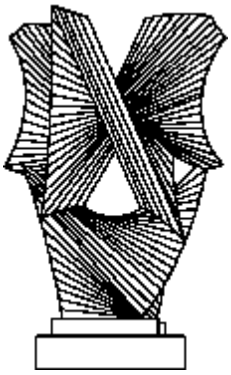

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The (Non)Taxation of Risk

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January 12, 2004

Abstract

A long line of literature argues that income taxes do not tax the return to risk bearing. The conclusion, if correct, has important implications for the choice between an income tax and a consumption tax and for the design of income taxes. The literature, however, on its face seems unrealistic because it models only very simplified tax systems, assumes perfect rationality by individuals, and requires the government to take complex positions in securities markets to hold in equilibrium. This paper examines the extent to which these problems affect the conclusions we draw from the literature. It argues that the criticisms are overstated. Moreover, the criticisms do not detract from the central value of the models, which is to understand ideal income taxes, which are the purported goal of most who support an income tax.

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The (Non)Taxation of Risk

David A. Weisbach*

January 12, 2004

The singular feature of an income tax is that it imposes a tax on capital income.[1] It is this feature that distinguishes an income tax from wage or consumption taxes. A tax on capital income, and hence an income tax, is thought by many to be desirable for fairness and distributional reasons. Individuals who do particularly well in the market can afford to pay more tax and rightly share a higher burden of the cost of government because of their increased wealth. Moreover, the tax on capital income is responsible for most, or even substantially all, of the complexity of the current income tax, which means we must believe strongly in its value for it to be worth retaining. Given the large stakes, there have been long and heated philosophical debates about the merits of taxing capital income.[2]

There is a line of literature arguing, however, that the debates over the taxation of capital income are based on a false belief. Income taxes, the literature argues, do not tax most returns to capital.[3] This is not because of loopholes or implementation problems –

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*Professor, University of Chicago Law School. I thank Bob Green, Louis Kaplow, and participants at the Harvard Law School tax colloquium and workshops at Chicago and Toronto for comments.

[1]For example, an ideal Haig-Simons tax taxes individuals on the change in value of their assets in each period. If an individual's assets go up in value, she owes tax, producing a tax on capital income. See Robert M. Haig, The Concept of Income – Economic and Legal Aspects, in The Federal Income Tax 1 (Robert M. Haig ed. 1921), reprinted in Am. Econ Ass'n, Readings in the Economics of Taxation 54 (Richard A Musgrave & Carl Shoup, eds., 1959); Henry C. Simons, Personal Income Taxation 50 (1938).

[2]The debate goes back at least to Hobbes. See T. Hobbes, The Leviathan 298. Contributors include such philosophers as John Stuart Mill and John Rawls and economists such as Adam Smith, A.C. Pigou, Nicholas Kaldor, and Irving Fisher. See John Stuart Mill, Principles of Political Economy, Book V, ch. II, §4; John Rawls, A Theory of Justice at 278-79; Adam Smith, Wealth of Nations, bk. 5, chap.2, pt.2; A.C. Pigou, A Study in Public Finance 118-26 (3d ed., 1951); Nicholas Kaldor, An Expenditure Tax (1955); Irving Fisher & H. Fisher, Constructive Income Taxation (1942). The debate continues into modern times. See, e.g., What Should be Taxed, Income or Expenditure? (Joseph Pechman, ed. 1980); William Andrews, A Consumption-Type or Cash-Flow Personal Income Tax, 87 Harv. L. Rev. 1113 (1974); Alvin Warren, Jr., Would a Consumption Tax be Fairer Than an Income Tax?, 89 Yale L. J. 1081 (1980); Robert Hall & Alvin Rabushka, The Flat Tax (2d ed. 1995).

[3]See, e.g., E.D. Domar, & R.A. Musgrave, Proportional Income Taxation and Risk-Taking, 58 Quarterly Journal of Economics 388 (1944); James Tobin, Liquidity Preference as Behavior Towards Risk, 25 Review of Economic Studies 65 (1958); J. Mossin, Taxation and Risk-Taking: An Expected Utility Approach, 35 Economica 74 (1968); Joseph Stiglitz, The Effects of Income, Wealth, and Capital Gains Taxation on Risk-Taking, 83 Quarterly Journal of Economics 262 (1969); Agnar Sandmo, Portfolio Theory, Asset Demand, and Taxation: Comparative Statics with Many Assets, 44 Review of Economic Studies 369 (1977); Jeremy Bulow and Lawrence Summers, The Taxation of Risky Assets, 92 Journal of Political Economy 20 (1984); Roger Gordon, Taxation of Corporate Capital Income: Tax Revenues versus Tax Distortions, 100 Quarterly Journal of Economics 1 (1985); Joseph Bankman and Thomas Griffith, Is the Debate Between and Income Tax and a Consumption Tax a Debate about Risk? Does it Matter? 47 Tax L. Rev. 377 (1992); Louis Kaplow, Taxation and Risk-Taking: A General Equilibrium Perspective, 47 National Tax Journal 135 (1994); Alvin Warren, Jr.,

the arguments apply to ideal income taxes. The reason is that capital income is mostly a return to bearing risk, and individuals, even in a Haig-Simons system, can, and will, eliminate the tax on this type of return. To illustrate, suppose that in a world without taxes, an individual would bet $100 on a coin flip (representing pure risk). If the individual is subject to a 50% tax, the bet becomes a $50 bet. By doubling his bet to $200, however, the individual can be back in the same place even after taxes are imposed. Therefore, the individual is completely indifferent between the worlds with and without taxes because his payoffs are unchanged. All that is left of capital income to be taxed is the risk-free or pure time value return. This amount, however, is historically very low, which means that notwithstanding initial understandings, income taxes tax very little capital income.

If this conclusion is true – if income taxes do not tax returns to risk bearing – it has the potential to completely change our understanding of taxation. If a Haig-Simons income tax taxes only the risk-free return, it effectively does not tax capital because the risk-free return is historically close to zero.[4] Therefore, a Haig-Simons tax is basically the same as a consumption tax (which imposes a zero rate of tax on capital), and the debate between the two tax bases is not particularly meaningful. The decision might best be made on administrative grounds rather than on deep philosophical arguments about the proper distribution of the tax burden.[5]

Similarly, proponents of income taxes argue that income taxes are particularly fair because they tax winners more than losers.[6] Think again of the coin flip. The winner pays a 50% tax on his winnings while the loser deducts his losses. If we believe the taxation and risk literature, this fairness argument is false. The returns to risk-bearing are

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How Much Capital Income Taxed Under an Income Tax is Exempt under a Cash Flow Tax, 52 Tax L. Rev. 1 (1996); James Poterba, Taxation, Risk-Taking, and Household Portfolio Behavior, in 3 Handbook of Public Economics 1110 (Alan Auerbach and Martin Feldstein eds. 2002); Noel Cunningham, 52 Tax L. Rev. 17 (1996); David Weisbach, Taxation and Risk-Taking with Multiple Tax Rates, forthcoming, National Tax Journal 2004.

[4]I will qualify this statement somewhat in Section I.D. below. In particular, if an individual has a limited opportunity to make a profit above the normal profits available in the market, income taxes will tax this amount. Consumption taxes, however, also tax these so-called inframarginal returns. Therefore, the taxation of inframarginal returns should not play a role in distinguishing between income and consumption taxes.

[5]See Bankman and Griffith, supra note 3; William Gentry and R. Glenn Hubbard, Distributional Implications of Introducing a Broad-Based Consumption Tax, in 11 Tax Policy and the Economy (James Poterba ed. 1977); William Gentry, and R. Glenn Hubbard, Fundamental Tax Reform and Corporate Financial Policy, in 12 Tax Policy and the Economy (James Poterba ed.1998).

[6]Michael Graetz, Implementing a Progressive Consumption Tax, 92 Harvard L. Rev. 1575, 1601 (1979) ("Circumstances must be considered as similar only after results are known; lucky gamblers are not the same as unlucky gamblers.").

not taxed at all under an income tax, so winners are taxed exactly the same as losers. The goal of taxing winners more than losers does not support an income tax.

There are also a number of implications about the design of an income tax, assuming we are going to have one. For example, if we are only going to tax the risk-free rate of return to capital, there are a variety of ways of doing so that might be much cheaper to administer than a Haig-Simons system. We might be able to achieve identical efficiency and fairness goals at a lower cost. And the effects of taxing inflationary returns become more important. If we thought we were taxing the full return to capital, taxing inflation may not change the overall results very much because inflation will often be a low percentage of the full return. But if we are only taxing the risk-free return, inflation looms larger. Inflation may well equal or substantially exceed the risk-free return, and taxing inflationary returns may increase effective tax rates dramatically. Finally, measurement of capital income is difficult and expensive. If only the risk-free rate of return is taxed, crude measurements may be preferable to more expensive but more accurate measurements because the efficiency losses from crude measurements may be small.

The taxation and risk literature and the conclusions that follow from it, however, do not appear to have been widely accepted. Legal scholars still advocate for an income tax over a consumption tax (on grounds other than administrative grounds)[7] or over superior means of collecting a tax on the risk-free rate of return. Economists modeling the efficiency losses from income taxation almost uniformly assume that the full rate of return is taxed.[8] Studies of the distributional impact of income and consumption taxes similarly assume that the full rate of return to capital is taxed. Standard texts in tax policy and public finance either ignore or give short shrift to the literature.[9] And there are fierce

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[7]See, e.g., Michael Graetz, 100 Million Unnecessary Returns, A Fresh Start for the U.S. Tax System, 112 Yale L. J. __ (2002). One could, of course, understand and believe the taxation and risk literature and still argue for an income tax, but I'm not aware that anyone advocating for an income tax has taken this approach.

[8]See, e.g.,Don Fullerton and Andrew Lyon, Tax Neutrality and Intangible Capital, in 11 Tax Policy and the Economy (James Poterba ed., 1997); Don Fullerton and Yolanda Henderson, The Marginal Excess Burden of Different Capital Tax Instruments,79 Review of Economics and Statistics 435 (1989); Jane Gravelle, Effects of the 1981 Depreciation Revisions on the Taxation of Income from Business Capital 35 National Tax Journal 1 (1982); Jane Gravelle, The Economic Effects of Taxing Capital Income (1994).

[9]I am not aware of any tax policy book in the legal literature that even mentions the issue. See, e.g., Caron, Burke, and McCouch, Federal Income Tax Anthology (1997) (broad tax policy anthology with no mention of the issue); McIntyre, Sander, and Westfall, Readings in Federal Taxation (2d ed. 1983) (same); Philip Oliver, Tax Policy, Readings and Materials (2d ed. 2004) (same). The major public finance treatises tend to briefly describe the results of the literature (sometimes incorrectly) without mentioning any of the implications. See, e.g., Gareth Myles, Public Economics, (1997) at 214-219; Raghbendra Jha, Modern Public Economics (1998) at 224-228. The most recently published public finance treatise does not mention the issue. See Richard Tresch, Public Finance, A Normative Theory (2002). An important economics book entirely devoted to the taxation of capital income, fails to mention the issue. See Jane Gravelle, The Economic Effect

debates in public forums on whether or the extent to which capital income should be taxed.[10]

Because there has been no article or commentary arguing that the literature is flawed, we are left imagining the reasons why it has not been accepted. Part of the reason might be style – the literature tends to be mathematical and to some extent counter-intuitive, which makes it inaccessible to many. I will try to remedy some of that here, but ultimately, it takes some slogging to understand the key points.[11]

There might also be reasons more related to the merits. In particular, the models used in the literature are highly simplified abstractions of the real world. The tax system in most of the models is a perfect Haig-Simons tax. Individuals in the models adjust rationally to the tax in a zero transactions costs world. Moreover, for the conclusions of the models to hold in equilibrium, the government arguably must adjust its portfolio behavior in a precise fashion. The actual tax system, however, is not a perfect Haig-Simons system, individuals do not necessarily react rationally or live in a zero transactions costs world, and the government does not appear to adjust its portfolio in any particular manner in response to taxation. The models are triply idealized. It is, most likely, for this reason that the conclusions of the taxation and risk literature have not had a significant impact.

This paper examines the taxation and risk literature to determine the extent to which it should matter in our thinking about tax systems. The models are correct within their assumptions, so the key question is whether the assumptions are realistic, and to the extent they are not, how real world deviations from the models affect the conclusions.[12]

I will draw two conclusions. First, the models are not as unrealistic as they might seem at first. This is particularly true with respect to individual behavior, where it is easy to misinterpret the types of adjustments and calculations required by the models. All that is required for the models to hold is that individuals choose their investments based on after-tax prices. Second, and perhaps counter-intuitively, it does not matter very much to the conclusions we draw from the models that they are unrealistic. The models teach us

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of Taxing Capital Income (1994). The Handbook of Public Economics fairs somewhat better, with parts of two chapters focused on the issue. See, Handbook of Public Economics (Martin Feldstein and Alan Auerbach, eds.) (2001) (Chapter 5 by Agnar Sandmo and Chapter 17 by James Poterba).

[10] E.g., Debates over the growth of IRA's. Also, Norquist interview in ABA newsletter outlining scheme to move to a consumption tax. Debates over the Flat Tax.

[11] For relatively easy introductions to the literature, see Warren, supra note 3; Kaplow supra note 3.

[12] The only other paper that I know of that considers these issues is Deborah Schenk, Saving the Income Tax with a Wealth Tax, 53 Tax L. Rev. 423, 428-435 (1999-2000). Much of Schenk's analysis is consistent with the analysis here.

about the Haig-Simons ideal and therefore teach us about the claimed goal of many tax scholars. Because reform proposals are based on goals such as the Haig-Simons ideal, understanding the goals can have real consequences. In fact, we would not want to modify the models to reflect the real world because they would then cease to teach us about the Haig-Simons ideal.

To preview the analysis, consider all three types of idealizations mentioned above. First, current law is far from the ideal Haig-Simons tax in the models. Those who believe in Haig-Simons taxation presumably would prefer if the deviations from Haig-Simons under current law were removed. It may not be possible to have an ideal, Haig-Simons income tax, but income tax advocates presumably would choose one if they could. Few, for example, would prefer a realization-based tax with loss limitations and no inflation adjustments to a perfect Haig-Simons tax if administrative costs were low.

The taxation and risk models teach us, however, that a perfect Haig-Simons system is pretty much the same as a consumption tax, a wealth tax, or similar reforms. Many of these reforms, particularly a consumption tax, may be attainable. In fact, the models tell us that it is very likely that moving to a consumption tax would move us closer to the idealized Haig-Simons tax than any likely reform of current law would. Therefore, proponents of Haig-Simons taxation should be advocating for a consumption tax! The argument goes the other way too. Switching to a consumption tax may be too difficult. Proponents of a consumption tax, therefore, might want to consider perfecting the current income tax as a way of getting close to their ideal. The taxation and risk literature teaches us about the ideals we hold and in doing so, converts purportedly deep arguments about the appropriate tax base into arguments purely about administrability. It is irrelevant for this purpose that they do not model the actual tax system.[13]

The second deviation from the models is that individual behavior may not be as described. People may not adjust for any variety of reasons, including the computational complexity of the adjustments, transactions costs, and psychological problems with understanding the effects of taxation. This is a very common assertion in conversations one has about the models (although, again, I am not aware than anyone has systematically explored this in writing so we cannot be sure what the actual objections are).

There are a number of problems with the claim that individuals do not adjust. First, a claim that individuals do not adjust implicitly adopts the no-tax world as the status quo and assumes that individuals make adjustments from there to offset the effect of taxation.

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[13] Schenk, note __, argues that when the taxation and risk literature is applied to the actual tax system or any feasible realization-based income tax, the results are arbitrary. She concludes, therefore, that we should not impose an income tax and instead should impose a combination of a consumption tax and a wealth tax. Although I do not consider here how risk is taxed under current law, Schenk's conclusion that risk is unlikely to be taxed in a coherent fashion under current law seems likely to be correct.

This is how the models themselves are presented. The adjustments can seem large and complex from this perspective, and perhaps this is why they seem implausible.

For individuals to fully adjust to taxation, however, all they need to do is make investments based on after-tax returns. If they do so, they will have implicitly made all the calculations and adjustments implied by the models without ever having been aware of doing so.[14] Characterized this way, the taxation and risk literature seems more plausible and the claim that individuals do not adjust less so. The "no adjustment" position effectively assumes that individuals respond to pre-tax prices and, it is not obvious why we should generally believe that individuals predominantly respond to pre-tax prices rather than the actual prices they face, which are the after-tax prices.

Second, the assertion that individuals do not adjust is contrary to standard assertion that a cash flow tax imposes a zero rate of tax on capital. For a cash flow tax to impose a zero rate of tax on capital, individuals must make the very same type of portfolio adjustments predicted in the income tax and risk literature (and the government must similarly adjust its portfolio). It is, however, uniformly and unquestioningly assumed by both the legal and economics profession that a cash flow tax imposes a zero rate of tax on capital.[15] Either that conclusion must be dropped, we must agree that individuals adjust their portfolios under an income tax, or we must find a way of distinguishing the two cases (which I believe cannot easily be done).

If we get beyond these initial difficulties with the "no adjustment" position and assume that individuals do not adjust their portfolios in response to taxation, the conclusion should not be that the models are not important. Quite the opposite. If one views the pre-tax world as the baseline, a Haig-Simons system requires portfolio adjustments to offset the nominal tax on risk. The models show that individuals will want to make these adjustments. If individuals cannot do so, perhaps we should move to a tax where we get the same result as the ideal Haig-Simons tax but where individuals do not have to make these calculations and portfolio adjustments. For example, a wealth tax might not create the incentive to make portfolio adjustments that an income tax does. If people behave in response to pre-tax prices and returns, a wealth tax might be preferable

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[14]The reason the models start with a pre-tax return and show how adjustments can be made to keep that the same is to show equivalence between tax systems. They should not be read as implying that individuals have to calculate the adjustments based on pre-tax prices.

[15]The literature citing this proposition is too vast to list. The original statement is due to E. Cary Brown. E. Cary Brown, Business-Income Taxation and Investment Incentives, in Income, Employment and Public Policy: Essays in Honor of Alvin H. Hansen 300, 301 (1948). Other examples include William Andrews, A Consumption-Type or Cash Flow Personal Income Tax, 87 Harv. L. Rev. 1113 (1974); Daniel Halperin, Interest in Disguise: Taxing the "Time Value of Money," 95 Yale L.J. 506 (1986); Michael Graetz, Implementing a Progressive Consumption Tax, 92 Harv. L. Rev. 1575 (1979); David Bradford, Untangling the Income Tax at 67-68 (1986). The proposition is standard in basic tax casebooks. See, e.g., Michael Graetz and Deborah Schenk, Federal Income Taxation, Principles and Policies, 287-292 (Revised Fourth Edition, 2002)

because individuals will not have to adjust these prices and returns for taxation.[16] Therefore, we might care *more* about the conclusions of the risk-taking literature rather than less if individuals cannot adjust as predicted.

Very similar arguments apply to the government portfolio adjustments. The models once again present a misleading picture of the necessary government behavior because they compare the no-tax world to the taxed world. I have not yet even hinted at what the government adjustments are, however, so I will leave these arguments for Section III below.

This paper will proceed as follows. Section I will review the basic portfolio adjustment model, using a numerical example. Section II will then discuss the potential conclusions one might draw from the model. Section III will discuss the extent to which the models are unrealistic and how it matters, going into detail about the differences in real tax systems and the modeled system, in individual behavior and the modeled behavior, and government behavior and the modeled behavior. Section IV concludes by discussing some possible extensions of the models.

I. The Taxation and Risk Model

The taxation and risk literature argues that individuals can and will adjust their portfolios in response to an income tax to offset the effect of any tax imposed on the risky portion of their returns. The intuition is that an income tax taxes gains and allows deductions for losses, and thereby reduces the variance in outcomes from taking a bet. If individuals wish to restore the pre-tax variance, they can just increase the size of the bet. This section will develop this intuition through four increasingly complex examples. It then discusses how these conclusions translate to cash flow taxation.

A. *Pure, Zero-Expected-Return Bet*

The simplest case is a pure bet that has a zero expected return, such as a fair coin flip. For example, suppose that in a world without taxation an individual would bet $100 on a coin flip. If the coin comes up heads, the individual wins $100 and if it comes up tails, the individual loses $100. We need not specify why the individual takes this bet other than that he desires this particular risk and return.

Now suppose we impose a 50% tax on the bet. Under such a tax, if the coin comes up heads, the individual has a $100 gain and pays taxes of $50 on that amount, leaving

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[16] See Schenk, note __ for a version of this argument. The models show that individuals will not make portfolio adjustments under a wealth tax, but the models generally have only two periods. In a multiple period wealth tax, there may be incentives to make portfolio adjustments but the adjustments would be smaller than under an income tax. See Weisbach, Periodic Income and Wealth Taxes, manuscript. Therefore, the benefits of a wealth tax might be smaller than they initially appear with two period models.

him with $50. The government gets $50 in tax revenue. If the coin comes up tails, the individual can deduct the $100 loss and either use the loss against $100 of other income, thereby saving the $50 of taxes that would be due on that income, or be refunded (i.e., have the government write him a check for) the $50.[17] Either way, the individual loses only $50 after taxes, and the government loses $50 in forgone tax revenue. After tax, therefore, the individual will make $50 if the coin comes up heads and lose $50 if the coin comes up tails.

The individual prior to the imposition of the tax desired a $100 bet, but after taxes only has a $50 bet. The individual, however, can be in exactly the same place is he was prior to taxes by merely doubling the bet to $200. Taxes cut the $200 in half to a $100 bet, which is what our individual desires. Moreover, the individual not only can make such an adjustment. He *will* make such an adjustment. The reason is that the same set of returns are available to him in the taxed world and the no-taxed world, so he will make the same choice. The only difference is that he must double the nominal size of his bet in the taxed world to get that choice. Thus, if he would choose a $100 bet in a world without taxes, he *will* choose the $200 bet in a world with a 50% tax.

If the individual makes a $200 bet in the taxed world, the government will receive $100 in taxes if the coin comes up heads. If the coin comes up tails, the individual deducts $200, which costs the government $100 in taxes. Effectively, the government and the individual split the $200 bet on heads on a 50/50 basis. The government has zero expected revenue from this bet because it has equal chances of making and losing $100. The government, however, will have risk.

The government can eliminate the risk by placing the opposite bet, a $100 bet on tails. If it places this bet and the coin comes up tails, the government receives $100 from the bet, which offsets the reduction in taxes due to the deduction by the individual (who *lost* his bet because the coin came up tails). If the coin comes up heads, the government pays $100 on its bet, which offsets the taxes it would receive from the individual (who *won* his bet).

Suppose the government wants to enter into this offsetting bet. Who would enter into the other side? The tax system has caused our individual to want to increase the size of his bet on heads by $100, which is exactly the amount the government wishes to reduce the size of its bet on heads. So our individual would be more than willing to do so. Therefore, the increase in the bet on heads by the individual is exactly offset by the bet on tails by the government. In economic terms, it means markets clear and prices do not change because of the portfolio adjustments.

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[17] In a pure, Haig-Simons income tax, individuals would get refunds for net losses during the accounting period. Current law generally does not provide refunds, but the tax in the models is a Haig-Simons tax.

At the end of the day, what has happened by imposing a 50% tax on the bet? Absolutely nothing. The individual increases the size of his bet from $100 to $200 and pays half of the winnings to the government (or receives a payment in the case of a loss). But if the government offsets the risk it assumed because of the imposition of the tax, it takes the other side of the increased bet, so it pays or receives any tax revenue back to the individual. All that the tax has done is force individuals (and the government) to adjust their portfolios. No tax revenue is collected and no risk is shifted. The tax is a complete nullity. The following table summarizes the positions.

	No Tax	**50% Income Tax**
Individual		
Heads	$100	$200 - $100 in taxes = $100
Tails	($100)	($200) + $100 benefit of tax loss = ($100)
Government		
Heads	$0	$100 in taxes - $100 in losses on bet = $0
Tails	$0	($100) tax refund + $100 gain on bet = $0

The claim just made is that the 50% tax on purely risky returns is the same as no tax. We should be more careful about what this claim entails. Louis Kaplow articulated three extremely strict criteria for tax systems to be identical to one another.[18] First, taxpayers have to have the same after-tax wealth in each regime, in each state of the world. That is, if the coin comes up heads, the individual must have the same wealth in the 50% tax and no-tax world and similarly if the coin comes up tails. This is true – in the case of heads, the individual has $100 in the taxed and untaxed world and in the case of tails, the individual loses $100 in both the tax and untaxed world. Second, total (net) investment in each asset must be the same so that we know that asset markets clear with no price changes. This is also true. In a no tax world, the individual places a $100 bet on heads. In the taxed world, the individual places a $200 bet on heads but the government places a $100 bet on tails, so the net bet on heads is the same as in the no-tax world. Third, the government must have the same revenue in each regime in each state of nature. In the no tax world, the government obviously has no revenues. In the taxed world, the government still has zero revenues because the tax receipts (in the case of heads) or losses (in the case of tails) are offset by the bet on tails.

Note how restrictive these conditions are. Essentially, everybody and everything has to be in the same place in both tax systems (in this case, the taxed and the untaxed

[18] Kaplow, note 3.

worlds) in every state of the nature. Each individual has the same wealth in all states of the nature, the government has the same revenues, and investments are the same.

The government, of course, might not adjust its portfolio. It might like its chances on the taxes it will receive from coin flip. It might seem, then, that the equivalence breaks down. But the government does not need the tax system to take this bet. Instead, it can choose not to impose a tax and instead bet directly on heads in the marketplace. If it does so, we have *exactly* the same result as a tax system in which the government does impose a tax but does not offset the risks it assumed. We can think of (i) imposing an income tax without the government adjusting its positions as (ii) not imposing an income tax and the government adjusting its position. The income tax becomes in this case just a complicated, indirect, and very expensive way for the government to take market positions.

Note that the exact same logic goes through for any tax rate. For example, suppose the tax rate were 40% instead of 50%. Now a $100 coin flip either makes or loses $60. To get back to the pre-tax position, the individual must bet $100/$60 = $167. Then, when a 40% tax is imposed, the individual is left with a $100 bet. More generally, if the tax rate is t, the individual must make 1/(1-t) times his pre-tax bet. The government adjusts its portfolio similarly.

Finally, before moving on to the next case, it is worth considering the treatment to the other side of the coin flip. Suppose a different individual, also subject to taxation, enters into the other side of the bet. If the coin comes up heads, the other individual will deduct the exact amount that the first individual includes in income and vice versa for tails. Therefore, the government has no stake in the outcome whatsoever. The tax system merely causes the two individuals to double the size of their transaction, leaving them exactly the same place after taxes as before. If the individuals are subject to different tax rates, the government will have a partial stake in the bet. If the individual betting on heads has a higher tax rate, the government has a position in heads to that extent. If the individual betting on tails has a higher tax rate, the government has a position in tails to that extent. It can offset this position, as before. Therefore, the treatment of the other side of the bet does not change the basic results and we can simply think of risk as coming from events external to the tax system rather than from bets among taxpayers.

B. *Pure Bet, Positive Expected Value*

Now consider a bet with a positive expected return. Bets might have positive expected returns because individuals will not bear risk without being compensated. So suppose the individual betting on the coin flip now receives $120 if the coin comes up heads but pays only $100 if the coin comes up tails. The expected return is $10. The cost to the individual of entering into the bet is still zero – the expected return is compensation for bearing risk.

The results are the same as with the prior case. A 50% tax cuts the individual's return in half, to a gain of $60 and a loss of $50, and an expected payment of $5. The individual can and will double the size of the bet and be in exactly the same position as without tax.

The government's position is similarly identical. The government exposes itself to half the risk by imposing a 50% tax. If the individual adjusts by doubling his bet, the government has a 50% chance of winning $120 (half of the taxpayer's winnings of $240) and a 50% chance of losing $100 (half of the taxpayers $200 loss). The government has expected tax revenues of $10. Although it might at first appear that the government is collecting real taxes in this example, it is not. Instead, the $10 of expected return is the compensation for bearing risk and has no market value. To see this, note that the government has exactly the same bet as the taxpayer in the pre-tax world and we assumed that the taxpayer could enter into this bet for free. The government, therefore, can sell this risk (for its expected value of $0) to our individual who wants to increase his exposure in response to the tax. Once again, the tax system has no effect other than forcing people to adjust their portfolios. The table below summarizes.

	No Tax	**50% Income Tax**
Individual		
Heads	$120	$240 - $120 in taxes = $120
Tails	($100)	($200) + $100 benefit of tax loss = ($100)
Government		
Heads	$0	$120 in taxes - $120 in losses on bet = $0
Tails	$0	($100) tax refund + $100 gain on bet = $0

As before, the logic works for any tax rate. And as before, if the government chooses to impose a tax without making a portfolio adjustment, it could equally have chosen not to impose a tax and make a portfolio adjustment. The tax system reduces to nothing more than the government buying and selling securities in the market.

C. *Risky Investment*

The most realistic case is an investment with a time value return as well as risk. The idea will be that we can separate the risk component from the time value component and the exact same logic will apply to the risk component – taxpayers will adjust their bets to eliminate the effect of taxation. Because an investment requires an upfront payment, the adjustment appears to be slightly more complex. The logic, however, is exactly the same.

Suppose the individual makes an investment, say of $100 for one year. The investment has a 50% chance of being worth $130 in one year and a 50% chance of being worth only $90 in one year. The expected amount the individual will receive is $110 and the expected return is 10%. Assume, finally, that the individual could have alternatively invested in a riskless asset and received a return of 4% and that the individual can also borrow at this rate.[19]

We want to isolate the risky component of this investment and analyze how the taxpayer can (and will) respond to the tax on this component. To do so, decompose the investment into two parts. First, we can think of the individual as receiving a risk-free return of 4% merely to reward him for investing for the year – a pure time value return. Second, we can think of the individual as placing a bet. To get to the final values of $130 and $90 for winning and losing, he must receive an additional $26 if he wins and pay $14 if he loses. That is, if he wins the bet, he gets his $100 back, plus a $4 risk-free return, plus a $26 risky return for a total of $130. If he loses the bet, he gets his $100 back, plus a $4 risk-free, time value return, less a $14 loss on the bet, for a total of $90. The expected return on the bet piece of the investment is $6[20] (which combined with the $4 risk-free return makes up the total $10 expected return).

An unintuitive aspect of the decomposition is that if the individual only gets $90 back, it looks like he does not get back the risk-free $4. The reason is that the investment internally nets the $4 risk-free, time value return with the $14 loss on the bet, paying him just the $90. By decomposing the two, we are treating the $4 as being received in all cases but when the taxpayer loses the bet, he pays back $14. The diagram below illustrates the decomposition.

Now suppose that the government imposes a 50% income tax on returns to all investments. If the investment pays $130, the individual will have gain of $30 and pay a tax of $15, leaving him with $115. If it pays only $90, the individual has a loss of $10 which he can deduct, leaving him with $95. The expected return is reduced to $5 or 5%.

The decomposition still works, using the after-tax risk-free rate of return of 2%. The individual gets his $100 back plus a risk-free return of $2, makes an additional $13 after-tax if he wins the bet (for a total of $115, as required), and loses $7 after-tax if he loses the bet (for a total of $95 as required). The expected return on the bet element is now $3, the risk-free return is $2, adding to a total expected return of $5. Effectively, the 50% tax just cut everything in half. The diagram below illustrates.

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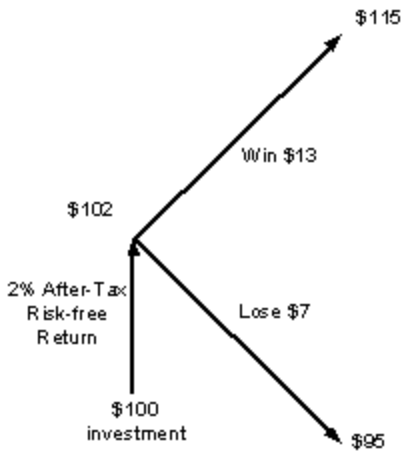
[19]The proofs all go through if the individual only borrows at a risky rate except that it is the individual's borrowing rate that is subject to tax. See Noel Cunningham, note 3.

[20]Computed as 0.5 x $26 - 0.2 x $14 = $6



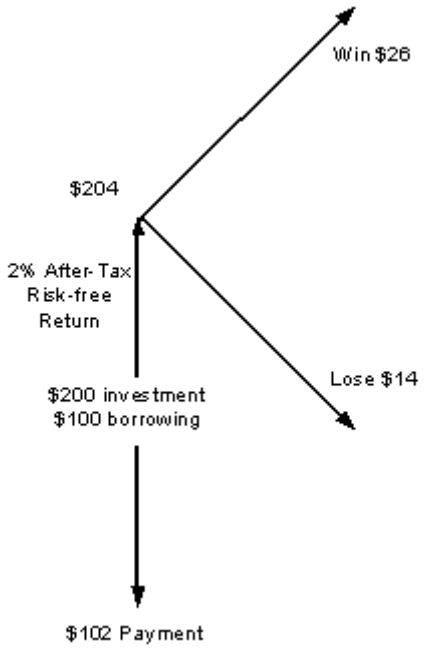
The individual will want to adjust his portfolio in response to taxation. To increase his position in the investment, the individual will have to come up with more cash. That is, unlike the pure bet case, if he wants to double his investment, he will need an additional $100. Suppose the individual borrows the $100, risk-free (alternatively, he can sell a $100 risk-free investment) and invests the proceeds in the risky investment.

His after-tax position is now as follows. This year he invests $200, $100 coming from the borrowing. Next year, he must pay back the $100 loan plus 4% interest. The interest can be deducted, saving him $2 in taxes, so the total after-tax cost to him of paying back the loan is $102. If we follow the decomposition on his investment of $200, he gets his $200 back and a 2% after-tax risk-free return on that amount, or $4. In addition, for each $100 invested, he also gets $13 after taxes if he wins and loses $7 after taxes if he loses For $200, this means he makes $26 or loses $14 on the bet piece.

Overall, after taxes next year he gets $204 risk-free and pays back $102, leaving him with $102. In addition, he has a bet with 50% chance of winning $26 and a 50% chance of losing $14. This is exactly the same as if we did not tax the bet at all but did tax the risk-free return. The only difference between this set of pay-offs and the pre-tax payoffs is the reduction in the risk-free return from $4 to $2 by the 50% tax. The table below summarizes the numbers. As can be seen in the last line, the individual is $2 worse off in all states of the world with taxation compared to without taxation. This $2 is the 50% tax on the $4 risk-free return.

		No Tax	50% Income Tax
Year 0	Investment	$100	$200
	Borrow	$0	$100
Year 1	Risk-free return	$104	$204
	Pay back loan	-$0	-$102
	Net	$104	$102
	Risky Return	$26/-$14	$26/-$14
	Overall return	$130/$90	$128/$88

The diagram below illustrates how the cash flows work with the decomposition diagram used above.[21]



[21]One implication of the example is that the bet piece we isolated in the investment has to have zero present value. The reason is that the borrowing and investing activity envisioned had no effect on the individual other than to double the bet. The net cost of the activity was zero, so the present value of the bet has to be zero. Therefore, if derivative markets in the risk in question exist, the individual need not borrow and buy an investment. Instead, he can eliminate the tax on risk merely by increasing his bet through a derivative. This makes the investment case look exactly like the coin flip. In addition, the borrowing rate becomes irrelevant, which means that the conclusions in Cunningham, note 3, would not hold.

To complete the example, we must consider the government side.[22] Suppose the government sells the investment short. It will receive proceeds equal to the value of the asset. Suppose it puts these in the bank, which is equivalent to saying that it invests in a risk-free asset and also equivalent to saying it lends the money, risk-free.[23] There is a ready buyer for the investment because the individual wants to increase his investment. There is also a ready borrower (buyer of the risk-free asset) because the individual wants to borrow money. If the government makes this portfolio adjustment, it eliminates any taxes on risky returns it would have received (in return for eliminating the tax losses from deduction on the risky returns) and is left with only the tax on the risk-free rate of return. The cash flows become complex and are laid out in the notes, but the concept is straightforward.[24] Like in the simpler cases, the net effect of the tax on risk is a nullity except to require individuals to make portfolio adjustments. And once again, a change in

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[22] If we use argument that the bet must have zero present value, see note __ supra, the government can offset the risk just like it could with the coin flips through the use of derivatives. The cash flows all wash in the same way.

[23] In a short sale, the seller borrows an asset and sells it. To close the short sale, the short seller purchases a replacement asset and returns it to the lender. If the price of the asset has gone down, the short seller makes money because purchasing the replacement asset costs less than the short seller received on the initial sale. If the price of the asset has gone up, the short seller loses money. A short sale is, effectively, a method of taking the opposite side of the bet from the purchaser of the asset, analogous to betting on tails when the taxpayer has bet on heads.

[24] Suppose the individual makes a $200 investment, borrowing $100. The government will get one half of the $8 risk-free return, or $4. In addition, the government will get half of the bet, or $26 if the bet pays off and -$14 if the bet loses. Finally, the government will lose $2 in taxes due to the interest deduction the individual gets on the borrowing. The net position for the government if it makes no portfolio adjustment is:

$4 taxes on the risk-free return to the investment - $2 on the interest deduction
+ $26 if the investment pays off - $14 if the investment does not.

Suppose the government adjusts its portfolio by selling a $100 risky investment short and investing in a risk-free asset. The government will receive $100 from the short today and pay out $100 to make the investment in the risk-free asset, netting to zero this year. Next year, it will receive $104 from the risk-free investment. It will also close the short sale. When the short sale closes, the government will owe $104 plus it will owe $26 more if the bet pays off or receive $14 if the bet does not. These risky returns amounts exactly offset the taxes received. The net effect is as follows:

Today: $100 received today, $100 outflow today.
Next year:
Taxes:
Receive $4 + either $26 or owe $14.
Owe $2 on interest deduction by individual
Risk-free investment:
Receive $104
Short sale
Owe $104 + either owe $26 or receive $14
Net: $2.

tax regimes, in this case from a tax on the nominal return to a tax just on the risk-free return without a government portfolio adjustment is the same as no change in tax but the government making a portfolio adjustment.

One subtlety in this last example is that the government collects real tax dollars on the risk-free return and the individual correspondingly pays real taxes. The individual, therefore, is poorer. Being poorer, the individual might desire to enter into a different amount of risk. The individual might change his investments and, therefore, taxation will affect risk bearing, unlike the assertions above. In economics lingo, there is a wealth effect.

But compare two tax systems. One taxes the risk-free return to investments and the other nominally taxes the entire return (a traditional income tax). There will be no wealth difference in these two taxes because both collect the tax on the risk-free return and only that tax. The two taxes are identical in the sense that any opportunity available under the traditional income tax can be achieved under the risk-free return tax and vice versa. Therefore, behavior has to be the same under both taxes and we need not worry about wealth effects.

Moreover, the two taxes are equivalent in the sense discussed above. Taxpayers, as just mentioned, have the same after-tax wealth under either regime in each state of nature. The net investment is the same in each regime because in the full taxation regime, the government's short position in the asset and the taxpayer's additional long position offset (as do the positions in the risk-free asset). Finally, government revenues are the same for the regimes. Therefore, the regimes are identical and there are no fairness or efficiency reasons to prefer one to the other.

D. *Inframarginal Returns*

The last extension of the example is to suppose that the individual finds a special opportunity that is not generally available in the market. The idea might be that not all investments are perfectly priced, exactly compensating individuals for risk and the time value of money. There might be unique opportunities with returns greater than the market return. In the literature on taxation and risk these are usually called "inframarginal returns." To be an inframarginal investment, the return on the investment must be above the market rate of return and the individual must not be able to invest more in the investment due to taxation. It must be a one-time opportunity.

If the individual has an inframarginal investment, portfolio adjustments will not eliminate the tax on the inframarginal return because additional units of the investment (or some other investment) will have a lower return than the initial units. The investor cannot increase his investment in the asset because of taxation so the investor cannot offset the portion of the return claimed by the government through taxation.

To illustrate, suppose in the investment we have been considering ($100 turns into either $130 or $90 in one year), the investor will receive an additional $10 if he wins the bet. Suppose, however, that he can only get this extra return on his initial $100 investment and not on any additional units he may buy. (Additional units have the normal return of $130.) The individual, for example, might have a special but limited business opportunity.

The portfolio adjustment will restore to the investor his original gain of $26 and loss of $14 but will not affect this additional $10. If we think about the bet as a coin flip, the assumption that the extra $10 is available on only the first $100 is like saying that the investor may not enter into additional coin flips on that $10. Therefore, he cannot offset the tax on that amount. He can enter into the additional coin flips to offset the tax on the $26 and $14 risk, so that amount remains untaxed.

To be more explicit (at the risk of inflicting pain), suppose the individual has the opportunity to invest $100 in an asset that will pay $140 one half the time and $90 the other half of the time. Because of the excellent return, the individual takes this opportunity. Any additional money invested, however, can only be invested in assets that produce $130 instead of $140. Suppose we impose a 50% tax, and the individual follows the strategy outlined above, borrowing money to increase his investments. The individual borrows $100 but can only invest it in an asset that pays $130 half the time and $90 half the time.

In the next period, if he wins his bet, he has $270 of cash ($140 on the special investment and $130 on the normal investment), a gain of $70, and taxes of $35, leaving him with $235. If he loses his bet, he has $180 of cash, a loss of $20, and a tax deduction that leaves him with $190. He also owes $104 on his loan but can deduct the $4 in interest. At the end of the day, he ends up with either $133 or $88.

We can characterize the $133/$88 return as follows. The individual receives $2 risk-free on his $100 investment, which is the after-tax risk-free rate on the investment. In addition, the individual receives $26 if he wins the bet and loses $14 if he loses the bet. Finally, the individual receives an $5 if he wins the bet, which is the inframarginal return of $10, reduced by a 50% tax. These numbers add up to $133 if he wins the bet and $88 if he losses. Thus, we can say that an income tax imposes a tax on the risk-free return and on inframarginal returns but not on returns to risk bearing. The numbers are summarized below.

		No Tax	**50% Income Tax**
Year 0	Investment	$100	$200
	Borrow	$0	$100
Year 1	Risk-free return	$104	$204
	Pay back loan	-$0	-$102
	Net	$104	$102
	Risky return	$26/-$14	$26/-14
	Inframarginal return	$10/0	$5/0
	Total	$140/$90	$133/$88

The breakdown of these numbers might seem somewhat arbitrary but it is not. The underlying concept is that taxes reduce the variance or spread of outcomes. Where the taxpayer can increase his bets, he can offset that effect. Where the taxpayer cannot increase his bets, in this case the risk-free return of $4 and the inframarginal return of $10, he cannot eliminate the tax. Thus, the taxpayer is taxed on the risk-free return and the inframarginal return but not on the pure return to risk-bearing.

The question is the extent to which there are inframarginal returns in the economy. If one believes that capital markets are moderately competitive, there should be few of such opportunities. Nevertheless, there are enormous fortunes and many of these are unlikely solely a result of risk-taking. One possibility is that many enormous fortunes are returns to skill or labor rather than capital but the tax system mislabels them as returns to capital. For example, Bill Gates's fortune is most likely a mix of luck and effort. It did not involve substantial capital investments by Gates and, therefore, might best be described as mostly return to labor. The same is true for Warren Buffet's stock picking skills.

Regardless of whether or the extent to which great fortunes are returns to labor or are inframarginal returns to investments, the important point is that pure Haig-Simons income taxes these returns.[25] The claim that an income tax does not tax returns to risk-taking does not mean it does not tax many or most of the vast fortunes held by some individuals.

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[25]Whether current law does is another matter and one which I take no opinion on here.

Note also that in the general equilibrium model where the government makes offsetting portfolio adjustments, there are no inframarginal returns because the government is always supplying the additional securities that the individual wishes to purchase.

E. *Cash Flow Tax*

The major competitor to a Haig-Simons income tax is a cash flow tax. A cash flow tax is a tax in which all cash outlays for investments are deducted and cash inflows from investments are taxed. As will be discussed below, a cash flow tax is thought to be a simple method of taxing consumption. Important consumption tax proposals, such as the Hall/Rabushka Flat Tax and the Bradford X-tax are cash flow taxes.[26] Traditional VATs are also variants of cash flow taxes.[27]

Cash flow taxes are thought to impose a zero tax on investment. In our strict terms of tax equivalence, a cash flow tax is equivalent to no tax. This proposition is sufficiently well accepted that it is often called a theorem, the Cary Brown Theorem, after its originator.[28]

This proposition is dependent on portfolio adjustments by both taxpayers and the government that are similar to those under an income tax. Consider the same investment used so far. It costs $100 and half of the time, will produce $130 and the other half of the time, it will produce $90. Suppose that the individual is subject to a 50% cash flow tax.

Under a cash flow tax, the individual receives a deduction of $100 when the investment is purchased. With a 50% tax rate, the deduction is worth $50. Suppose the individual invests this additional $50 in the same asset. He can now deduct another $50, giving him $25 more in cash. Investing this, he gets another deduction and the process continues. At the end of the day, he can invest $200 in the asset because of the benefit of the deduction for investment.

The $200 investment will produce either $260 or $180. Under a 50% cash flow tax, the individual must pay 50% of all proceeds to the government as taxes. After taxes, the individual will be left with either $130 or $90. This, of course, is the same return the individual would have had if the investment had never been taxed at all. The individual started with his initial $100 and after making the proper portfolio adjustments, ends up with the same return on that $100 that he would have had if the investment had never been taxed at all. Because the opportunity sets are the same under a cash flow tax and in a world with no taxes, behavior must be the same.

More formally, if the individual adjusts his portfolio by increasing the amount of all investments by 1/(1-t), he will be left in exactly the same place as if he had never been

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[26]See Robert Hall & Alvin Rabushka, The Flat Tax (2d ed. 1995); David Weisbach, Does the X-Tax Mark the Spot, 56 SMU L. Rev. 201 (2003).

[27]See David Weisbach, Does the X-Tax Mark the Spot, 56 SMU L. Rev. 201 (2003).

[28]See E. Cary Brown, note __.

taxed at all. The individual will have sufficient funds to make this investment because of the tax savings from the tax deduction allowed when the investment is made. The table below summarizes the numbers for an individual investor.

	No Tax	**50% Cash Flow Tax**
Time 0		
	$100	$100 + $100 investment due to deduction
Time 1		
Win	$130	$260 - $130 tax = $130
Lose	$90	$180 - $90 tax = $90

This conclusion about a cash flow tax is well known. The point here is that it is dependent on portfolio adjustments much like adjustments in the income taxation and risk literature. It hypothesizes that individuals will adjust their portfolio by putting the tax savings from the immediate deduction into more of the same investment. This additional investment is then exactly sufficient to pay off the tax when the original investment is sold.

The conclusion regarding a cash flow tax is also dependent on government portfolio adjustments in exactly the same way the income tax models are. Under our numbers, the government gives the individual $100 in tax refunds when the initial investment is made. When the investment pays out, the government gets either $130 or $90 in tax receipts. The cash flow tax means that the government has effectively purchased t units of the asset where t is the tax rate. The government can offset this by shorting t units of the asset for each unit purchased by a taxpayer, leaving it perfectly hedged and with zero cash in all states of the world. Moreover, if the government shorts the asset and the individual increases his investment in the asset, there is no net increase in investment in the economy. If the government does not make the portfolio adjustments, the Cary Brown theorem does not hold because markets will not clear. Thus, the taxation and risk-taking literature, while largely unfamiliar, is essentially the same and requires essentially the same assumptions about individual and government behavior as the long-familiar and universally accepted arguments about cash flow taxation.

Finally, note that inframarginal returns are taxed under a cash flow tax. The reasons are essentially the same as the reasons they are taxed under a Haig-Simons tax. Individual cannot gross up at the same rate of return as the original investment. Having inflicted sufficient pain already, I will skip the details, which are available in a variety of

sources.[29] An important conclusion from this is that both cash flow taxes and Haig-Simons income taxes tax great fortunes created through inframarginal investments or labor. The only difference between the two with respect to these fortunes is that income taxes tax the risk-free rate of return on these fortunes while cash flow taxes do not.

II. Implications

The taxation and risk literature, if we accept it, has potentially far reaching conclusions. Consider the following four.

A. *The Choice Between Income and Consumption Taxes*

Income taxes and consumption taxes are the two most widely used tax bases in the world. The debate over which is superior has occupied scholars for decades with no widely accepted resolution of the issue yet. The taxation and risk literature has important implications for this choice, and may even be decisive.[30]

Haig-Simons income in given period is defined as an individual's consumption plus change in savings in that period:

$$I = C + \Delta S$$

Rearranging the equation, consumption in a given period is income less change in savings.

$$C = I - \Delta S$$

Therefore, a tax on consumption is the same as a tax on income except that a consumption tax does not tax changes in savings. This is why we can think of a cash flow tax as a consumption tax. A cash flow tax taxes all receipts but allows a deduction for any savings (and inclusions for reductions in savings), which is exactly what is reflected in the right hand side of the above equation. We can also conclude that a consumption tax does not tax capital income because cash flow taxes do not tax capital income (other than infarmarginal returns).

Stated this way, the choice between an income tax and a consumption tax is a choice of whether to tax the capital income. Philosophical arguments have been made

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[29] See, e.g., Warren, note 3.

[30] This argument has been made by Bankman & Griffith, note 5 and Gentry & Hubbard, note 5.

both ways.[31] For example, Hobbes argued that consumption taxes better reflect the proportion of goods that individuals withdraw from the common stock[32]. John Stuart Mill argued that an income tax is inappropriate because it taxes savings twice.[33] Savings come from after-tax earnings, so they have been taxed once up front. Taxing capital income is a second tax on the same earnings. Progressives early in the twentieth century, and egalitarians today, argued that taxing capital is the only way of redistributing significant wealth from the rich to the poor because many wealthy have little wage income.[34] The passage of the 16th Amendment and the enactment of the income tax came about largely because of this logic. Rawls seems to generally prefer consumption taxation but argues that income taxation may be necessary if existing institutions are unjust.[35] Economists have debated whether taxing capital income is efficient and argue about the distributional impact of taxes on capital.[36] The debate shows no sign of slowing.

The taxation and risk literature may solve this deep philosophical debate with simple pragmatics. The risk-free return has historically been close to zero. All that an income tax taxes that a consumption tax does not is this amount. Therefore, an income tax taxes vanishingly little not taxed under a consumption tax. Notwithstanding the long debate over the two tax bases, they are essentially the same. There would be no significant distributional, efficiency, or fairness changes from choosing one base or the other.[37] The debate, therefore, is almost meaningless, and the decision is best made purely on administrative grounds rather than on theoretical considerations about the appropriateness of taxing capital.

The conclusion still follows if we focus on extraordinary or inframarginal returns to capital. Unlike the risk-free return, extraordinary returns are likely to be highly significant, and it may be important to tax these, both on efficiency and a fairness

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[31]For a general overview of philosophical arguments made about taxation, see Harold Groves, Tax Philosophers (1975).

[32]T. Hobbes, Leviathan 298 (A. Lindsay ed. 1959).

[33]John Stuart Mill, Principles of Political Economy, Book V., ch. II §4, at 814 (W. J. Ashley., ed, Logmans, Green & Co. 1909) (1948).

[34]See Steven Weisman, The Great Tax Wars (2002).

[35]John Rawls, A Theory of Justice at 278-79.

[36]See, e.g., B. Douglas Bernheim, Taxation and Saving, in 3 Handbook of Public Economics (Alan J. Auerbach and Martin Feldstein, eds., 2002).

[37]Bill Gentry and Glenn Hubbard, have been the authors who have made this argument in the most sustained fashion. See Gentry and Hubbard, Distributional Implications, note 5; Gentry and Hubbard, Corporate Financial Policy, note 5.

grounds. Indeed, more than merely returns to risk-bearing, it is extraordinary returns that likely motivated progressives and continue to motivate egalitarians to argue for income taxes. Whatever tax system we pick, the Vanderbilts and Rockerfellers of yesteryear and the Gateses and Buffets of today should pay high taxes. Both income and consumption taxes tax such returns, however. Therefore, however concerned we are about extraordinary returns, they should play no role in choosing between an income tax and a consumption tax. The only difference in the two tax systems is the risk-free return to capital and this is close to zero.

A central piece of the consumption tax debate is the transition to a consumption tax. The transition to a consumption tax is thought to impose a one-time tax on all wealth in society. This would be an enormous tax. If this one time tax on all wealth is a necessary part of consumption taxation and is not part of an income tax, our evaluation of its efficiency and fairness will be central to the choice of the tax base. For example, even if we otherwise do not like consumption taxation, if we view the one time tax on all wealth as highly attractive from either an efficiency or distributional standpoint, we may want to adopt consumption taxation notwithstanding our views on the rest of the tax.

There are several ways to show that a transition to a consumption tax can tax all wealth. One is simply to note that all future consumption must come either from existing capital or future wages (potentially saved and turned into future capital). To tax all future consumption, as required by a consumption tax, we must tax both sources. Because of this reasoning, economists have asserted that a system that fails to tax existing wealth is not a consumption tax, by definition.[38] Others have built extensive models of the tax system based on definitions like this.[39]

A more technical version of the observation is to note that current law uses basis to track savings that have already been subject to tax. In a cash flow tax, basis would no longer matter. If we ignored existing basis accounts, we would be ignoring the fact that much capital has already been taxed and, therefore, tax it again. Consider for example, a retailer who purchasers $100 of canned goods when there is an income tax.[40] Suppose a cash flow consumption tax is imposed overnight and the next day the retailer sells the goods for $101. If the income tax had been retained, the retailer would have had $1 of gain, equal to receipts less the cost basis. A cash flow tax allows a deduction for costs

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[38]For example, Jane Gravelle argued that "providing relief to old capital [not taxing all existing wealth] is inconsistent with the *fundamental nature* of a consumption tax." (emphasis added). Jane G. Gravelle, The Flat Tax and Other Proposals: Who will Bear the Tax Burden?, 69 Tax Notes 1517 1521(1995).

[39]Alan J. Auerbach and Laurence J. Kotlikoff, Dynamic Fiscal Policy (1987) (defining a consumption tax as a tax on wages and existing capital).

[40]This example comes from David F. Bradford, Fundamental Issues in Consumption Taxation 19-44 (1996).

when they are incurred and taxes all receipts when earned. The cash flow tax in this case, however, would not allow a deduction for the $100 because that was incurred prior to the tax being enacted. Instead, it would tax the retailer on the full $101, effectively imposing a tax on the $1 of gain and the $100 of existing, already-taxed capital.

It is not clear what the rationale might be for imposing a one-time tax on existing capital. We should not decide to do it because of a definition. And the details of the basis accounts seems a bizarrely technical way to think about the problem – it is easy to construct income and consumption tax systems that do not have this mismatch in basis accounts.[41]

The real argument for taxing existing wealth is that it is thought to be efficient and have good distributional consequences. The efficiency arises because it is seen as a one time and unavoidable tax. The good distributional consequences arise because a tax on existing capital would fall heavily on the wealthy. The potential efficiency gains are so large that economists have argued that a switch to a consumption tax increases welfare if, but only if, it includes the one-time tax on existing capital.[42]

The taxation and risk literature shows that much of the thinking on transition between an income tax and a consumption tax is confused. The only change when we switch between the two tax systems is that we would no longer tax the risk-free rate of return. The two tax systems are otherwise identical. Therefore, it is hard to imagine any efficiency reason for taxing all existing capital on the transition that would not also argue for taxing all existing capital on a one time basis while retaining an income tax. If it is efficient to tax existing wealth on transition to a consumption tax, it is efficient to tax it even though we retained an income tax because the two taxes are essentially identical. Under the technical basis argument, switching to a consumption tax effectively wipes out existing basis. If it is efficient to wipe out basis on the switch to a consumption tax, it should be efficient to wipe out basis under an income tax.

B. Taxation of Opportunities or Outcomes

Another important debate in taxation is whether individuals should be taxed based on their opportunities or on their outcomes. Consider two individuals with the same

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[41] For the mechanics of such proposals, see, Daniel Shaviro, When Rules Change, (2000) at 171-196 (chapter on transition from an income to a consumption tax); Dale Jorgenson and Alan Auerbach, Inflation-Proof Depreciation of Assets, _ Harvard Business Review 113 (1980).

[42] Alan Auerbach and Lawrence Kotlikoff, Dynamic Fiscal Policy (1987).

amount of cash. If they make different investments, they might have very different outcomes even though they have the same opportunities. It is not clear which is the better basis for taxation. Outcomes might seem the appropriate tax base because how well off an individual is depends on the outcomes of his bets. As Michael Graetz said, lucky gamblers are not the same as unlucky gamblers.[43] On the other hand, opportunities might seem the appropriate tax base. Individuals with the same opportunities can be seen as the same.[44] Taxing outcomes would discourage these similar individuals from making the choices that they desire. Individuals with different opportunities would, of course, be taxed differently but by taxing opportunities, we can better achieve a version of equality.

We can rephrase the argument as a distinction between ex ante and ex post taxes. An ex ante tax determines the amount of taxes due prior to any action taken by the taxpayer. For example, a wealth tax is an ex ante tax because it taxes the value of a taxpayer's investments at a given point in time even if those investments turn out to lose money. An ex post tax bases taxes on actual outcomes. A Haig-Simons income tax is ex post because if the wealthy taxpayer's investments turn out poorly, the taxpayer gets a loss.[45]

The difference between outcomes and opportunities or ex ante and ex post, is how risky investments are treated. Absent risk, outcomes can be predicted from opportunities. For example, if our two individuals with the same wealth invested in risk-free assets, they would have the same outcomes. Only if they invest in risky assets might their outcomes differ.

If we believe the taxation and risk literature, however, income taxes and consumption taxes do not tax risky outcomes. Winning and losing gamblers are treated

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[43]Michael Graetz, Implementing a Progressive Consumption Tax, 92 Harvard Law Review 1575, 1601 (1979).

[44]See David Bradford, Untangling the Income Tax (1986) at 163.

[45]Consider, for example, two individuals, one worth $1 million and the other worth $100,000. If we impose a 2% wealth tax, the first individual pays a tax of $20,000 while the second individual pays a tax of $2,000 regardless of how their investments fare during the year. For example, those taxes would be due even if the millionaire lost all his money during the year and the other individual became a millionaire. An ex post tax, such as a typical income tax, would look at the actual outcomes at the end of the year and tax the individuals based on that outcome.

Most taxes are imposed periodically and for periodic taxes, the differences begin to fade because the end of one period is the beginning of another. If imposed at the same frequency, ex ante and ex post taxes look the same except for the first and last periods.

the same. Think again of our two individuals with the same initial wealth. Both will bear a tax on the risk-free return on that wealth regardless of how it is invested and regardless of the outcome of the investments. There is no difference between taxing opportunities and outcomes within an income or consumption tax. Like in the consumption tax debate, this means we can choose between nominally ex ante and ex post taxes based on administrative considerations.

For example, wealth taxes and income taxes are the same under this logic. Consider an individual with $100 who invests it in our running example (50% chance of getting $130 and 50% chance of getting $90 in one year). If the risk-free return is 4%, a 50% income tax will impose a cost on the individual of $2, regardless of actual outcomes. Instead of imposing a 50% income tax, we can impose a 2% wealth tax, forcing the individual to pay the same $2 to the government. There are no fairness or efficiency reasons to prefer an income tax to a wealth tax or vice versa and the decision should be made purely on administrative grounds.

Similarly, Alan Auerbach has proposed a tax on income which he calls a retrospective tax.[46] Auerbach would impose a tax on an asset based on the difference between the sales price and a fictional purchase price equal to the sales price discounted back to the purchase date at the risk-free rate of return. Although not immediately intuitive, the tax is equivalent to a Haig-Simons tax from an ex ante perspective. It does not, however, have any of the valuation or cash flow problems present in a Haig-Simons system because no tax is due until realization. Moreover, unlike a realization system, it has no lock-in or deferral.

One might think that a potential problem with Auerbach's tax is that even individuals who lose money on their investments pay a positive tax, as if they had made money. The tax is based on the amount realized less a fictional purchase price which is *always* less than the amount realized. Therefore, the tax imagines that there is *always* gain on an asset even if there really was a loss. Auerbach himself believed that this presented fairness issues.[47]

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[46]Alan J. Auerbach, Retrospective Capital Gains Taxation, 81 American Economic Review 167 (1991). Generalized versions of this tax can be found in David F. Bradford, Fixing Realization Accounting: Symmetry, Consistency, and Correctness in the Taxation of Financial Instruments, 50 Tax L. Rev. 731(1997), and Alan J. Auerbach & David Bradford, Generalized Cash Flow Taxation, 88 Journal of Public Economics 957 (2004).

[47]See Auerbach, Retrospective Taxation, at 176.

If, however, there is no difference between ex ante and ex post taxes, Auerbach's scheme does not present fairness issues, or at least any fairness issues not present in a Haig-Simons tax. The reason is that a Haig-Simons tax also does not tax winners and losers differently. Even those who lose their bets pay a tax equal to the riskless return on their wealth under a Haig-Simons tax. Therefore, if we believe the taxation and risk literature, those who support a Haig-Simons tax should have no fairness objections to Auerbach's scheme.[48]

The one place we must be careful about ex ante taxes is if there are large inframarginal returns. Most people agree that it is both efficient and fair to tax these returns. An ex ante tax might miss them while ex post taxes, such as the Haig-Simons tax and a cash flow tax, do not. Therefore, we might not be able to freely substitute an ex ante tax for these taxes. Perhaps the intuitions about taxing winners more than losers is related to inframarginal returns. To the extent it is, the intuition argues for certain forms of collecting income or consumption taxes but not for one tax base over the other.

C. Accuracy and Deadweight Losses from Non-Uniform Tax Rates

Accurate measurement of income is a perpetual problem for taxes on capital such as an income tax. They tend to be inaccurate for two reasons. First, certain types of capital are explicitly favored. For example, the costs of intangibles is often immediately deducted while the costs of a machine of similar value must be capitalized and depreciated over time. Second, capital income is notoriously hard to measure. For example, a Haig-Simons system requires annual valuations. A realization system allows deferral and requires estimates of depreciation.

Inaccuracies in measuring capital income create inefficiencies. Ideally, all capital income would be taxed at the same rate. If the effective rate on one type of capital income is lower than the rate on another, the tax system will distort investment incentives. Businesses will use more of the favored type of capital than they would absent taxes. Estimates of the efficiency losses from differential capital taxation can be very high.[49]

If, however, only the risk-free rate of return is taxed, accuracy may be unimportant. The efficiency losses from mismeasurment should be small because the tax imposed is small. To illustrate, suppose that the tax rate on all assets other than intangibles is 50%,

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[48]Kaplow, note 3, provides a formal proof of this claim.

[49]See, for example, Dale Jorgenson and Kun-Young Yun, Tax Reform and the Cost of Capital (1991).

but that intangibles are expensed, producing a 0% tax rate (which is roughly true under current law). If the expected return on intangibles is 10%, one might think that the benefit of expensing is eliminating the 50% tax on the full 10% return, or 5%. If, however, the income tax does not fall on the returns to risk-bearing, the benefit of expensing may be much smaller. If, for example, the risk-free return were 2%, the benefit from expensing is approximately 1%, which is roughly the benefit from eliminating the 50% tax on the 2% risk-free return. This is only 1/5 of the benefit calculated by assuming the tax applied to the full return.

The implications could be very important. Estimates of the deadweight loss from capital income taxation almost uniformly assume that the full rate of return to capital is taxed.[50] These estimates may be too high by an order of magnitude. The deadweight loss of taxation is thought to go up with the square of the tax rate.[51] If the full rate of return is, say, eight times the risk-free rate, the deadweight loss measured using the full rate of return will be approximately *sixty-four times* the deadweight loss measured using only the risk-free rate. Similarly, the government is struggling right now with the proper treatment of self-constructed intangibles.[52] It is difficult to capture these costs and estimate their future value, but failure to do so gives them a tax advantage over other types of investments. If only the risk-free return to capital is taxed, the advantage may be small, and the benefits of spending resources to tax intangibles more accurately may not be worth the benefits.

D. Inflation

If we believe the taxation and risk literature, the taxation of inflationary returns becomes much more important than previously thought. In a Haig-Simons tax, inflationary returns are not taxed because they do not represent either consumption or an increase in savings. For example, if an individual has $100 now and inflation is 3% a year, $103 next year represents the same consumption and savings opportunities. He is no better off in any sense by having $100 now or $103 in one year. A Haig-Simons tax, therefore, must adjust the gain or loss in any asset by inflation.

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[50] See sources cited in note 8.

[51] See, Harvey Rosen, Public Finance (4th ed. 1995) at 313.

[52] Thomas Evans and Gregory Gallagher, INDOPCO–The Treasury Final Acts, 80 Taxes 47 (2002); Prop. Reg. §1.263(a)-4

Current law does not have adjustments for inflation.[53] Inflation adjustments have been proposed several times but never adopted.[54] The reason why seems to be that inflation adjustments are complex, particularly when applied to debt instruments (the amount of interest deductions and inclusions must be reduced by the portion of interest representing inflation). Another reason might be that inflation is relatively low and, therefore, arguably unimportant. Were inflation to approach the double digit rates of the late 1970's, the push to index for inflation might be greater.

If we believe the taxation and risk literature, even relatively low rates of inflation might be important. The reason is that even low rates of inflation are large when compared to the risk-free rate of return and taxing even small inflationary returns might substantially increase the tax on capital.

To illustrate, Bankman and Griffith argue that the risk-free return during the period from 1929 to 1989 was 0.5% and that the average rate of inflation during the same period was 3.1%.[55] An ideal, indexed Haig-Simons tax would tax the risk-free rate of return. With a 50% rate, the tax on a $100 investment would be $0.25. If we instead fail to index the tax system and tax the nominal 3.6% return at a 50% rate, a $100 investment would bear a tax of $1.8. This tax exceeds the real risk-free rate of return on the individual's investment. In fact, it is equivalent to an income tax on real returns imposed at a 360% rate, 7.2 times the nominal tax rate! If we were to imposes a consumption tax instead, we would impose a zero rate. The income tax would have more than seven times the error of a consumption tax.

If we had thought that an income tax was on the full, nominal rate of return rather than the risk-free rate of return, however, the effects of the tax on inflation, while significant, are not of the same order of magnitude. For example, if the full, nominal rate of return is 10%, a 50% tax on the nominal rate imposes a tax of $5 for a $100 investment. The real return (10% - 3.1%) is 6.9%, so the tax is equivalent to a $5/$6.9 tax, or a 72% tax. This is a big increase from the stated 50% rate, but not anywhere near the effect if only the risk-free rate of return is taxed. The reason for this effect is that

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[53]To be accurate, the tax brackets are adjusted for inflation but not the amount of gain or loss in an asset. Adjusting the tax brackets is a separate issue from adjusting the gain or loss calculations.

[54]See e.g.,Department of the Treasury, Tax Reform for Fairness, Simplicity, and Economic Growth (1984) at 97.

[55]See Bankman and Griffith, note 5.

inflation is a much larger percentage of the risk-free return than of the entire return, so the error from taxing inflation is correspondingly higher.

If we believe the taxation and risk literature, therefore, inflation adjustments may be worth the complexity. Inflation can cause the tax rate to significantly exceed the nominal rate and create efficiency losses. Moreover, if we believe that inflation adjustments under an income tax are infeasible, there are strong reasons to prefer consumption tax. A cash flow consumption tax would come closer to measuring income than an unadjusted Haig-Simons income tax!

III. Evaluating the Models

The implications of the taxation and risk literature are dramatic. Anyone who really believed the literature would be likely to have significantly different views on tax policy than they might otherwise have had. Perhaps people believe the literature and the implications have not yet been fully appreciated. But given the lack of prominence, it seems likely that most scholars simply do not believe that the literature is relevant and the likely reason why is that the models seem unrealistic.

The taxation and risk models are arguably unrealistic in three important ways. First, they do not model the actual tax system. Instead, they model a hypothetical, perfect Haig-Simons tax which differs in significant ways from the real tax system. Second, they do not necessarily predict the response individuals would actually make to the hypothetical tax system because there are transactions costs that may limit portfolio adjustments, because the portfolio adjustments are so complex that individuals may not understand them, and because individuals may not react rationally. Finally, the models do not seem to track government behavior. Governments do not appear to adjust their portfolios as required in the models. The taxation and risk literature models show how hypothetical, super-rational beings would respond in a zero transactions cost world to an imaginary tax system imposed by a fictional government.

This section discusses each of these criticisms in detail. Ideally, I would consider each implication of the literature in light of each criticism. To keep the discussion manageable, however, I will focus on what we learn from the literature about the differences between income and consumption taxes, with occasional references to the other implications where particularly relevant.

A. Doesn't Model the Actual Tax System

Potential Problem

The tax system in the models is highly idealized. Income is measured perfectly in each period and taxed at a single fixed rate. This deviates from our actual tax system in any number of important ways. Consider some of the major ones.

First, and perhaps most important, the actual tax system does not tax income until it is realized.[56] While the exact meaning of the realization rule is complex and in many cases unclear, the core idea is that individuals are not taxed on an investment until it is sold. The advantage of the realization rule is that it reduces the valuation problems and cash flow problems in a Haig-Simons system (which requires annual valuation of all assets and payment of tax even if the taxpayer remains invested). There are many disadvantages to the realization rule. For example, gain and loss can be deferred until long after they accrue. Moreover, taxpayers can choose when to realize gain or loss, which means that the realization system creates incentives to sell loss assets and hold gain assets, distorting investment patterns. The resulting uneven tax rates and "lock-in" and "lock-out" problems are not reflected in the taxation and risk models.

Second, realization creates a need for host of other tax rules which distort investment incentives. For example, gains from the sale of an asset are often taxed at a lower rate under the capital gains rules than ordinary cash flows from the asset are taxed.[57] While the need for a special capital gains rate is disputed, the concept of a capital gain is a creature of realization. Moreover, even without a special capital gains rate, distinctions remain between capital gains and ordinary income because capital gains are generally offset against basis while ordinary income is not.[58] The Haig-Simons tax in the models does not have and does not need special capital gains definitions or rates because sales are irrelevant to the tax.

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[56] See Eisner v. MacComber, 252 U.S. 189 (1919).

[57] See I.R.C. §1

[58] Compare for example, the treatment of dividends under I.R.C. §301 (ordinary income, not offset against basis) with redemptions under I.R.C. §302 (capital gain, offset against basis).

Similarly, because of realization, the actual tax system has a number of limitations on the use of losses. Capital losses, for example, can only be used against capital gains.[59] Net losses during the year do not generate a refund of taxes as they would in a pure Haig-Simons tax and instead can only be used against gains in future years. Interest deductions are often limited.[60] These loss limitations often mean that losses cannot be fully deducted, which in turn means that losses are effectively taxed at a different rate than are gains. If losses are taxed at a different rate than gains, no single portfolio adjustment can offset the effect of taxation on risk. The reason is that an individual would need to adjust his portfolio to a different extent depending on whether a return was taxed at the loss rate or the gain rate.[61]

Realization also means that the tax system has to provide complex rules for the capitalization and depreciation of expenses. The idea behind these rules it that to measure income, expenses must be recovered over time to match the realization of income from an investment. But the rules are highly imperfect, creating different effective tax rates on different types of investments.[62]

All of these rules are complex and distort behavior. As a general matter, we can think of them as imposing different tax rates on different types of income, but their effects may be more subtle because they are often dependent on transactional form. The general version of the taxation and risk models discussed above includes none of these details of actual law.

Third, current law imposes a separate tax on corporations. The corporate tax, like loss limitations and capital gains rates, imposes different rates on different types of income. Income from partnerships or other non-corporate businesses is taxed at a different rate than income from corporations. Income from redemptions of corporate

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[59]See I.R.C. §1211 (limiting the deduction of capital losses to capital gains plus $3,000).

[60]See, e.g., I.R.C. §163(d) (limiting investment interest deductions to investment income).

[61]For example, if gains are taxed at a 50% rate, the individual will want to double his position. But if losses are taxed at a 25% rate, he will only want to increase his position by a third (1/(1-.25) = 1.33). No single portfolio adjustment can offset both taxes exactly.

[62]See Jorgenson and Yun, note __.

stock are taxed at a different rate than dividends. Income from debt is taxed at a different rate than equity. The taxation and risk literature includes none of these complications.[63]

Fourth, current law taxes the inflationary return to investments. For example, if an individual buys an asset for $100 and sells it the next year for $103 when inflation is 3%, the individual is taxed on $3 even though it represents only inflation and not gain. The models do not include inflation at all and, therefore, model a tax on only real returns.

Finally, current law imposes graduated rates on capital income. Therefore, an individual's winnings, should he be so lucky as to win a bet, might be taxed at a higher rate than the rate at which his losses are deducted, should he be so unlucky as to lose a bet. That is, winnings might push an individual into a high tax bracket while losing might push the individual into a low tax bracket. The losses, therefore, would be deducted at a lower rate than the gains would be taxed. The effect is similar to loss limitations.

The models can be adjusted to take into account some of these complexities. For example, they have been modified to include the effect of loss restrictions, limitations on interest deductions, and capital gains.[64] Similarly, the models have been modified to allow different assets to be taxed at different rates or different components of asset returns to be taxed at different rates.[65] Other complexities are more difficult to model. For example, the realization rule has to be modeled as an option because the taxpayer has the choice of realizing gains or losses. Tax rules that rely on transactional form are even more difficult to model. Even the most ambitious models, which would probably be highly complex and contingent on assumptions, would not capture the complexity of the actual tax system.

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[63]See, Department of the Treasury, Integration of the Individual and Corporate Tax Systems (1992) at 3-12, for a summary of these issues.

[64]See Atkinson and Stiglitz, Lectures on Public Economics at 112-117.

[65]See Jeremy Bulow, & Lawrence Summers, The Taxation of Risky Assets, 92 Journal of Political Economy 20 (1984); David Weisbach, Taxation and Risk-Taking with Multiple Tax Rates, forthcoming, National Tax Journal.

General Response

The key argument is that many tax scholars and tax policymakers view a Haig-Simons tax as the best possible income tax.[66] It is thought to be the most fair and the most efficient income tax. How well the existing tax system is performing is often measured against a hypothetical Haig-Simons system. It is almost certainly unreachable, but it remains the desired goal.

The taxation and risk literature tells us important facts about this goal. In particular, the literature directly illuminates what it is that advocates of income taxes claim to want. The models show that a Haig-Simons tax does not tax returns to risk-taking. Therefore, we cannot accept a Haig-Simons tax and yet reject a consumption tax on the grounds that a consumption tax does not tax returns to risk-taking. We can reject both taxes on this basis, but we cannot accept one and not the other. That the tax system in the models does not resemble current law is entirely irrelevant to this argument.

Another way to phrase the argument is to note that realization and all that goes along with it are second best. Income tax advocates would prefer a Haig-Simons system but because of liquidity, valuation or other problems, we have a realization system. Suppose that the taxation and risk models do not apply to the current law realization-based system and also that it turns out that returns to risk bearing are taxed under current law. We should not conclude that it is desirable to tax returns to risk bearing merely because they are taxed now. Income tax advocates have a stated preference for a Haig-Simons tax and in that system, returns to risk-bearing are not taxed. Given this stated preference, any tax on returns to risk-bearing under current law should be viewed as a flaw in current law. Just like scholars complain that realization creates deferral and lock-in problems, they should also complain that realization or other aspects of current law impose an unjustified tax on risk (if in fact this is the case).[67]

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[66] As summarized by Richard Musgrave, after the work of such pioneers as Haig and Simons, the comprehensive tax base "became the banner of tax reform in the United States, designed to secure equal treatment of taxpayers with equal income (horizontal equity) as well as to provide a global base on which progressive rates could be assessed in a meaningful fashion (vertical equity). . . . [I]t clearly provided the focus of analysis and delight for a generation of tax economists in the United States." Richard Musgrave, A Brief History of Fiscal Doctrine, in Handbook of Public Economics (Alan J. Auerbach and Martin Feldstein, eds. 1985).

[67] One response to this argument is to abandon Haig-Simons taxation as a goal. Advocates of Haig-Simons taxation might once have thought that the returns to risk-bearing were taxed under a Haig-Simons tax. If this is not true, Haig-Simons should be abandoned and another sort of system that does tax returns to risk-bearing should be adopted. That is, the fundamental commitment of income tax advocates might be to taxing

The lessons from the taxation and risk literature about simpler methods of collecting income taxes are strengthened rather than weakened by claims that the literature does not model the current tax system. Realization, loss restrictions, capital gains rules, and many of the other complexities of current law are justified because a Haig-Simons tax is too hard to implement. While not ideal, they are thought to be the closest we can come to measuring income. The models, however, show that something close to a perfect Haig-Simons tax can be collected through mechanisms other than the one envisioned by Haig or Simons. Moreover, many of these mechanisms do not have the implementation flaws of the Haig-Simons collection mechanism. Therefore, we should prefer these other mechanisms to both current law and potentially to a Haig-Simons tax itself (because they would be cheaper to collect).

For example, many believe that a cash flow consumption tax would be far simpler to implement than current law. A cash flow system eliminates the need for tracking basis in assets. Similarly, a cash flow system would not need specific inflation adjustments because they occur automatically.[68] And a cash flow system does not create lock-in or lock-out problems because the present value of the tax is the same regardless of when an asset is sold. Notwithstanding these benefits, income tax advocates do not desire a cash flow tax because they prefer the claimed fairness or efficiency benefits of an income tax to the potential administrative savings from a consumption tax.

The models show, however, that a perfect Haig-Simons system is not that different from a consumption tax because the risk-free return is historically low. Moreover, income tax systems have difficulty avoiding taxes on inflationary returns. Therefore, a cash flow system may be closer to a Haig-Simons system than is current law. For example, suppose inflation is 3% and the risk-free return is 1%. A non-inflation adjusted

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all returns to capital, including risky returns, rather than to the failed Haig-Simons method of doing so.

Such an argument would be a dramatic change in position for income tax advocates. The Haig-Simons definition of income has long been enshrined as the goal and abandoning could not be done lightly. Moreover, I am not aware that anyone has actually taken this position, at least in writing. It is not clear, therefore, whether it is sustainable. We would have to know what the alternative tax that taxes risk-taking would look like. It most likely would not look like a conventional income tax. Moreover, we would have to understand what the effects would be and whether those effects are desirable. There is no reason to believe that the arguments for ths position would not be strong, but to evaluate the arguments, income tax advocates who wish to abandon the Haig-Simons ideal in favor of a system that taxes returns to risk bearing would have to lay out the alternative system that they desire.

[68] See David Bradford, The Case for a Personal Consumption Tax, in What Should be Taxed: Income or Expenditure (Joseph Pechman ed. 1980) at 87-88.

income tax would tax the sum of these two, or 4%, while a consumption tax would tax 0%. An ideal income tax would tax 1%. The consumption tax is closer to an ideal income tax than the non-inflation adjusted income tax. In fact, a cash flow system might be closer to a Haig-Simons system than a realization-based system could ever hope to be. The best way to impose an efficient and administrable income tax, therefore, might be to be impose a consumption tax, and advocates of a Haig-Simons system should support a cash-flow consumption tax! Alternatively, they might want to explore cheaper ways of implementing an income tax, such as Auerbach's retrospective tax.

The argument works the other way around. Consumption tax advocates might want to argue for improving the income tax. Consumption taxes might turn out to be very difficult to implement. For example, the transition to a consumption tax is thought to present difficulties. Similarly, the taxation of financial intermediaries is thought to be especially complex under a consumption tax.[69] If it turns out that consumption taxes are hard to implement, consumption tax advocates might do better by arguing for improvements to the income tax. In either case, whether income tax advocates argue in favor of consumption taxes or vice versa, the taxation and risk models show that the relevant variable is administrative costs rather than efficiency, fairness or other theoretical considerations.[70]

The bottom line is that the fact that models do not reflect real world does not mean they do not teach us something about the ideals we have for the tax system and, therefore, that they do not have real world consequences. The models can be and to some extent have been modified to model the real tax system more closely. We might learn a lot from such an exercise. For example, we might understand which deviations from pure Haig-Simons taxation are more inefficient or unfair. There is nothing wrong and much good that comes with a better understanding of current law. But such benefits come in addition to the central benefit of the taxation and risk literature, which is to tell us about the ideals we have for the tax system. The critiques that the models do not track current law do not reduce the core value of the models. Instead, the critiques suggest avenues for further learning, suggesting that we can learn even more from the models rather than less.

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[69] See David Bradford, Treatment of Financial Services under Income and Consumption Taxes, in Economic Effects of Fundamental Tax Reform (Henry J. Aaron and William G. Gale eds. 1996).

[70] Schenk makes a similar argument for replacing the income tax with a wealth tax. See Schenk, note __.

Graduated Rates

The argument made so far does not fit graduated rates. The taxation and risk models generally do not include graduated rates, and unlike realization, taxation of inflation, loss limitations, restrictions on interest deductions, the corporate tax, and similar problems with current law, graduated rates may be desired to introduce progressivity into the system.[71] To the extent risky returns should be taxed at graduated rates, and to the extent the results of the models change with graduation, the models do not tell us about the ideal income tax.

The application of graduated rates to returns to risk taking has not been explored in the literature.[72] While a complete exploration would require a separate paper, I will outline some of the considerations here. I will make three points. First, the only type of rate structure that makes the models inapplicable is one in which the same taxpayer is taxed at a higher rate on gains than losses. Current law and perhaps many idealized systems, does not do very much of this, so the models may still be largely applicable. Second, taxing risky returns at graduated rates (in the relevant sense of making the models inapplicable) seems unattractive. Third, graduated rates on risky returns may be an inevitable result of attempting to tax hidden labor income at graduated rates. Any resulting taxation of risky returns would be an undesired effect of achieving another goal rather than a desired end itself.

Before considering these arguments, first consider how graduated rates change the examples discussed in Section I above. Consider the simple $100 coin flip, but now suppose that gains are taxed at a 75% rate while losses are deducted at a 25% rate. Absent taxes, the individual would have entered into a single bet in which, if the coin came up heads, he won $100 and if the coin came up tails, he lost $100. After-taxes and with no portfolio adjustments, he would make only $25 if he wins and lose $75 if he loses. Graduated rates deprive the loser of the benefit of the full tax savings from his loss, leaving him in this example $50 worse off. There is no way to adjust the bet to restore the pre-tax position. For example, if he doubles his bet, after-taxes he would win

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[71]Note that graduated rates and progressivity are different. A tax system has graduated rates if marginal rates increase with income. A tax system is progressive if individuals with higher income pay a higher share of it in taxes. It is possible to have progressivity with a flat rate by using a uniform grant given to each individual or family. The taxation and risk models would fully apply to a progressive tax system with this structure. Therefore, the text refers only to graduated rates, not progressivity. Progressivity is the reason for having graduated rates but it is graduated rates, not progressivity, that might cause the model not to apply.

[72]One exception is F.A. Cowell, Some Notes on Progression and Risk-Taking, 42 Economica 313 (1975).

$50 and lose $150. Graduate rates, therefore, break the equivalences described above. The same holds true for cash flow consumption taxes.[73]

For graduation to affect the results concerning taxation and risk, gains from an investment have to be taxed at a different (higher) rate than losses. Even if individuals with higher wealth face a higher tax rate than those with lower wealth, if gains and losses for investments made by those individuals are taxed at the same rate, they can their adjust their portfolios to eliminate the tax on risk. Graduated rate in this sense would mean only that the risk-free rate of return and any inframarginal returns are taxed at different rates for different individuals. The conclusions of the taxation and risk literature, however, would still follow – risky returns would remain untaxed. The only type of graduated rates that potentially changes the conclusions are rate structures in which gains from a particular investment are taxed at a different rate than losses.

It is not clear the extent to which current law does this. For individuals of sufficient wealth, the tax rates become flat. Bill Gates, Warren Buffet, and others with dynastic fortunes are taxed at flat rates. Even the merely wealthy, such as married couples with taxable income over $250,000 (adjusted for inflation), are taxed at flat rates. Individuals of moderate means may face increasing rates on gains, but most individuals of moderate means hold large portions of their wealth in tax-exempt form through their retirement accounts. Moreover, much wealth that is held in taxable form is often taxed at capital gains rates, which are flatter than ordinary income rates. And much wealth is held in corporate form and the tax on corporations is roughly flat. Although empirical work would be necessary to confirm it, a good first approximation might be that very little capital income is taxed at graduated rates in the relevant sense under current law.[74]

Taxing risky returns with graduated rates is unattractive, at least on initial examination. Consider the coin flip discussed above. Taxing it with graduated rates means that gains are taxed at a higher rate than losses. At the extreme, we would tax

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[73]In cash flow consumption taxes, however, taxpayers can avoid the effects of graduation by leveling their consumption. The reason is that the system measures consumption, and higher rates would only apply in periods in which consumption is high. By leveling consumption, individuals can assure that the same rate applies over time.

[74]This leaves aside the effects loss restrictions and the like, which can have similar effects. Loss restrictions, however, are clearly second best and the arguments of the previous section apply. Schenk, note __, argues that loss restrictions and other inevitable features of a realization-based income tax make the taxation of risky returns arbitrary in any such tax. Even if progressive taxation of capital income were desirable in a Haig-Simons tax, she would conclude that it would not be desirable under an actual income tax because of this arbitrariness.

gains and disallow deductions for losses. Those who lose their bets in such a system would be denied the benefit of deducting their losses. That is, the main effect of taxing risky returns with graduated rates is to hurt those who are worse off. Presumably, those in favor of progressivity and redistribution would oppose such a system. That is, if we follow Graetz's argument that winning gamblers are not the same as losing gamblers, we would have the opposite rule – we would allow those who lose their bets to deduct their losses at a higher rate than winners are taxed. Or said yet another way, those who lose their bets would be much happier with a flat rate schedule than a graduated rate schedule. If our goal is to help those who lose their bets, it is hard to see why we would want graduated rates.[75]

Third, the best and perhaps only reason for imposing graduated rates on risky returns is that it is difficult to separate returns to labor from risky returns from capital investments. For example, most of the tax on Bill Gate's fortune will nominally be imposed on capital (such as through the sale of his stock in Microsoft) even though much of it may be a return to labor. Warren Buffet's stock picking gains are best described as returns to effort rather than returns to investments, but are inevitably taxed as capital income. If we desire a progressive tax on returns to labor we might have to impose a graduated tax on returns to capital.

What do we learn in this case? The graduated tax on risky returns is a second best result of the desired progressive tax on labor income. A truly ideal Haig-Simons tax, even a progressive one, would not have such a tax on risky returns. Therefore, we should view any tax on risk-taking because of our need to tax hidden returns to labor at a progressive rate as a cost. We should look for other methods of taxing hidden returns to labor that do not have this cost. The argument is then the same as the arguments made in the previous section about realization and other second best features of current law.

To summarize, aside from graduated rates, most of the deviations in the model from current law are irrelevant to the core lessons from the model. The reason is that the model tells us the effects of a pure Haig-Simons tax and, therefore, tells us about the tax

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[75]This conclusion is merely preliminary and there may be a variety of other considerations. For example, a complete analysis would have to incorporate rate changes to keep the budget in balance. Those who lose bets may not be worse off due to graduated rates because the higher taxes paid by winners may allow overall reductions in tax rates. Similarly, graduated rates apply across an individual's entire income, not on a bet-by-bet basis so, for example, individuals who are hurt by low tax rates on their losses may benefit because those rates may apply to their labor income. Firm conclusions about the effect of taxing bets with graduated rates would require a much more detailed analysis than done here. The discussion is meant merely to be suggestive and a complete analysis is beyond the scope of this paper.

that many scholars desire. Notwithstanding that both the Haig-Simons tax and the tax in the model are not realistic, there are important practical consequences to understanding the equivalence. Adjusting the models to make them more realistic might tell us even more but would only add to the value of the models. Graduated taxes on capital are the one case where the deviations of the model from the real world might matter. The best case for a graduated tax rates on capital is that many so-called returns to capital actually represent returns to labor. Any resulting tax on risky returns, however, would be undesirable.

B. *Doesn't Model Actual Individual Behavior*

Potential Problem

Even if the tax system in the model resembled the real tax system. the model makes heroic assumptions about the ability of individuals to adjust their portfolios in response to taxation. There are at least three such assumptions.

First, the model assumes that there are no transactions costs to reallocating a portfolio in response to taxation. This may not be true. For publicly traded securities, the transactions costs are relatively low, but they are still positive. Given the size of the necessary adjustments, even low transactions costs may become significant. Moreover, many individuals have investments in illiquid assets, such as small businesses. and the transactions costs of adjusting the size of investments in these assets may be prohibitive. And, the tax system itself imposes an impediment to reallocation because of the capital gains tax.

Second, the required portfolio adjustments are complex. The examples above illustrate the difficulties with making the calculations in a simplified tax system. The calculations in a more complex system would be even more difficult. It is possible that individuals would not understand how to make the adjustments.

Finally, individuals may not respond rationally to the incentives imposed on them through the tax system. The models predict that individuals will adjust their portfolios by showing that the opportunity sets in two worlds (for example, a world with a tax on the risk-free rate of return and one with a tax nominally on the entire return) are the same. If the opportunity sets are the same, behavior has to be the same. But behavioral economics

disputes this claim.[76] The same opportunity set can produce different behaviors because of framing effects, endowment effects and the like. Therefore, showing that opportunity sets are the same is insufficient.

In fact, because of complexities like these, it is hard to know where to start when trying to predict the behavior of individuals regarding their portfolios. They do not diversify in accordance with accepted financial wisdom, they waste significant resources trading securities (losing money while they're at it), and the do not seem to take full advantage of tax savings opportunities such as realizing losses while deferring gains. Individual portfolio behavior seems irrational. It is arguably a heroic assumption to believe in the face of all this irrationality that they respond to complex and subtle tax signals in the manner predicted.

This section examines the logic behind this criticism and the limited empirical evidence on point. I will argue that the logic behind the criticism misconceives the models. I will then argue that even if the criticism is true, the models lose very little of their power, although it depends on the reasons why individuals do not adjust their portfolios.

Should we expect individuals to adjust their portfolios?

The models predict that rational individuals will adjust their portfolios in response to taxation. They make this prediction by showing that the opportunity sets under a Haig-Simons tax and under a tax on the risk-free rate of return are the same given costless portfolio adjustments. Therefore, given a behavior under one of these taxes, we should expect equivalent behavior under the other with portfolio adjustments to offset the change in tax regimes.

Many seem to believe that individuals do not adjust their portfolios as predicted.[77] Although we cannot be sure of the basis for the belief, one reason might be confusion over what the models require. The models compare two states of the world. Often the comparison is between a no-tax world and the fully-taxed world. Alternatively, as suggested above and in some of the literature, we can compare a fully taxed world with a

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[76] See Christine Jolls, Cass Sunstein, Richard Thaler, A Behavioral Approach to Law and Economics, 50 Stanford L. Rev. 1471 (1998).

[77] Like with the criticism that the tax system is not modeled realistically, I am not aware of any writing disputing the claim that individuals adjust their portfolio. The assertion in the text comes from my understanding of what many individuals familiar with the literature believe.

world with a tax only on the risk-free rate of return. Regardless, individuals make large portfolio adjustments when they switch between the worlds.

The intuition that individuals do not adjust might arise because we never see individuals making these large adjustments. Because we rarely go from the untaxed to the taxed world, however, we should rarely expect to see such adjustments. We would also rarely expect individuals to actually make the calculations predicted in the models. For example, to the extent tax rates stay the same, we should never see *any* adjustments, even if individuals were behaving exactly as predicted. Individuals also would not have to make any of the calculations used in the models. Instead, individuals would merely enter into risky positions based on after-tax payoffs. The only place we are likely see adjustments is if tax rates change, but most rate changes may be sufficiently small and sufficiently intertwined with other tax law changes that anecdotal evidence (as opposed to large scale statistical studies) might miss the resulting portfolio adjustments.

There are good reasons to believe that individuals do act consistently with the models. Individuals spend their whole life in an after-tax world. When deciding on investments or assuming risk, people are likely to take into account the after-tax returns. If they are not taking into account after-tax returns, they are making systematic mistakes and can improve their risk/return payoffs. For example, if they look at pre-tax prices rather than after-tax prices, they may have less risk than they truly desire. While we may not believe that individuals are perfectly rational and always make the best possible decisions, as a first cut, we should probably believe that they respond to the prices and incentives that they face, which are the after-tax prices and incentives. If true, individuals implicitly adjust without making the calculations predicted in the models.

Moreover, claims that individuals do not adjust need a theory explaining how individuals do behave. The taxation and risk models are based on standard assumptions about individual behavior, assumptions that are widely used in both the income tax and consumption tax literatures. They merely assume that individuals respond to the after-tax prices and risks that they face. It is not sufficient to claim that the theories are wrong without a more plausible story of how individuals do behave. Without an alternative theory, the standard theory may be the best we have.

Finally, it is uniformly and unquestioningly accepted that individuals would make similar portfolio adjustments under a cash flow tax. Although the details of the adjustments vary in an income and cash flow tax, the key ideas are the same. Moreover, the adjustments are of approximately equal complexity. In fact, to calculate the adjustment under a cash flow tax, individuals must be able to sum an infinite series, which is much more difficult than the calculations under an income tax. It is hard to see

how we distinguish the cash flow tax from the income tax case. Either scholars must abandon the Cary Brown theorem or accept that an income tax does not tax returns to risk.[78]

To summarize, I believe that our expectations or priors, in the absence of empirical evidence, should be that individuals do respond to the incentives imposed on them through taxation. In particular, it is likely that they enter into risky positions in light of taxation consistent with the predictions in the literature.

The Empirical Evidence

The empirical evidence is insufficient to sway us one way or another. There are a number of studies of the effects of taxation on portfolio choice, but none have been able to isolate and analyze the type of adjustments considered here. Moreover, the studies tend to suffer (through no fault of the authors) from data and conceptual problems. A good survey of the evidence can be found in the Handbook of Public Economics,[79] and the discussion below is drawn from this survey. The bottom line result is that there is pretty good evidence that portfolios are sensitive to tax considerations, some contrary evidence, and, as mentioned, no evidence that is sufficiently nuanced to isolate the types of effects considered here.

There are two problems with measuring how individuals adjust their portfolios in response to taxation. First, few data sets include sufficient information on high-net-worth households whose behavior is central to the studies. Household surveys based on random

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[78]Some have suggested to me in conversations that behavioral economics might distinguish between the types of adjustments in cash flow and Haig-Simon taxes. The difference in the two is that in a cash flow tax, the individual gets a deduction when making an investment, producing immediate tax savings and the individual must decide what to do with the savings. In a conventional income tax, individuals receive basis rather than an up front deduction. Therefore, the two differ in how they might be perceived by someone, say, subject to framing effects.

It is not clear, however, that this argument shows that it is more likely that individuals will adjust under a cash flow tax, and it is possible that it shows that they would be *less* likely to adjust under a cash flow tax. Individuals have to decide what to do with the additional cash from the deduction. The Cary Brown theorem assumes that they will invest the additional tax in the same asset, an assumption which can be justified on rational choice grounds. Behavioral theories might predict that individuals would spend this money in other ways because it looks as if it were free. Arguments from behavioral economics, therefore, might cut the other way, suggesting that adjustments under an income tax are more likely than under a cash flow tax.

[79]See James Poterba, Taxation, Risk-Taking, and Household Portfolio Behavior, Handbook of Public Economics, Vol. 3 (Alan J. Auerbach and M. Feldstein, eds.) 2002.

population samples do not have sufficient response rates among high-income or high-net worth individuals to be reliable. Moreover, the data we do have on high-income households is often insufficiently broken down into asset types. Second, we do not have a good understanding of the choices individuals do make. Almost no households hold the market portfolio, as predicted by theory. This means that asset demands in the models must be conditioned on the set of assets a household owns, making modeling much more difficult. A third problem not mentioned in the Handbook survey is that much of the adjustment to changes in tax rates involves shifts to or from tax-favored assets. The taxation and risk literature can accommodate different tax rates on different assets, so empiricists should be able to disentangle portfolio adjustments because of the effect of taxation and risk and adjustments because assets are tax-favored. The studies, however, do not clearly do so.

Within these limitations, there are six studies on the effects of taxation on portfolio choice in the U.S.[80] Four of the six studies show that households adjust their portfolios in response to taxation. The most recent and comprehensive study is by Poterba and Samwick.[81] They look at the Survey of Consumer Finance for five different years and conclude that marginal tax rates have important effects on asset allocation decisions. On the other side, Scholz, in 1994, concluded that the 1986 Tax Reform Act effected the level of tax-deductible borrowing but he did not find any clear evidence of other portfolio

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[80]There are also two from abroad, both of which support the conclusion that individuals adjust their portfolios. See, J. Agell & P. Edin, Marginal Taxes and the Asset Portfolios of Swedish Households, 92 Scandinavian Journal of Economics 47 (1990); S. Hochguertel, R. Alesie & A. van Soest, Savings Accounts versus Stocks and Bonds in Household Portfolio Allocation, 99 Scandinavian Journal of Economics 81 (1997).

There are a large number of studies on other aspects of investment behavior that should be affected by taxation. For example, there are studies about whether individuals maximize their use of capital losses, studies on investments in tax-exempt bonds, studies on the use of insurance, and studies on whether mutual fund managers are tax efficient. For a summary of these studies and a bibliography, see James Poterba, Taxation, Risk Taking, and Household Portfolio Behavior, note __. Like the studies on portfolio choice, these studies paint an inconsistent and incomplete picture of the extent to which tax rules affect investment behavior. Moreover, the rational adjustments to taxation are often complex and predictions about failure to adjust are often incorrect because they fail to correctly determine the appropriate adjustments. Compare J. Dickson & J.B. Shoven, Taxation and Funds: An Investor Perspective, in 9 Tax Policy and the Economy 151 (James Poterba, ed. 1995) (arguing that mutual funds do not maximize after-tax returns) with M. Barclay, N. Pearson, & M. Weisbach, Open Ended Mutual Funds and Capital Gains Taxes, 49 Journal of Financial Economics 4 (1998) (arguing that because of subtle tax rules for mutual funds, the behavior observed by Dickson and Shoven does maximize after-tax value).

[81]James Poterba & Andrew Samwick, Taxation and Household Portfolio Composition: US Evidence from the 1980s and 1990s, 87 Journal of Public Economics 5 (2002).

shifts.[82] Poterba argues that there are reasons why Scholz's study is flawed, but at this point, we are left debating details of the empirics and are not yet at the point where we have clear conclusions.[83]

In sum, we do not yet have statistical or other evidence establishing whether individuals adjust their portfolios because of the effect of an income tax on risk. Those who believe that the models are likely to be true cannot yet claim empirical support. On the other hand, skeptics must also be careful because at this point, four of six studies show some types of adjustments are made. The "no adjustment" position, that only pre-tax prices matter, is unlikely to be sustained.

Conclusions from the Literature if Individuals do not Adjust

Suppose individuals fail to adjust their portfolios as predicted. We do we learn? It probably depends on why individuals are not adjusting and how individuals are setting their portfolios. Consider four possibilities. First, the adjustments might be too complex. Second, trading costs might be too high. Third, individuals might be subject to framing effects or other psychological problems that prevent them from acting the same way when presented with identical opportunity sets. Fourth, individuals may hold unique assets, such as small businesses, in which they cannot adjust their ownership. Assume in each case that individuals set their portfolios according to pre-tax returns. (The conclusions might be very different if individuals set their portfolios on some other basis. This is one reason why claims that individuals do not adjust need a theory explaining what type of behavior we should expect.)

Complexity. Suppose that the adjustments are simply too complex. If individuals could figure out the proper adjustments, they would make them, but because of the complexity of the adjustments, they fail to make them or make them incorrectly. It is not clear why this would be so. Individuals do not have to make the calculations necessary to translate between pre and post-taxed worlds. They merely need to decide how much risk they desire based on after-tax returns. But suppose that this calculation is too

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[82] J. Scholz, Portfolio Choice and Tax Progressivity: Evidence from the Surveys of Consumer Finances, in Tax Progressivity and Income Inequality (Joel Slemrod, ed.) 1994.

[83] Other papers on portfolio choice include Martin Felstein, Personal Taxation and Portfolio Composition: An Econometric Analysis, 44 Econometrica 631 (1976); R. Glenn Hubbard Personal taxation, Pension Wealth, and Portfolio Composition, 67 Review of Economics and Statistics 53 (1985); Mervin King and Jonathan Leape, Wealth and Portfolio Composition: Theory and Evidence, 69 Journal of Public Economics 155 (1998); and Adam Samwick, Portfolio Responses to Taxation: Evidence from the End of the Rainbow, in Does Atlas Shrug (Joel Slemrod ed. 2000) at 289.

burdensome, and it is easier for individuals to make this determination based on pre-tax prices and returns. For example, the tax law might be sufficiently complex that determining after-tax prices might be difficult.

One response might be that the problem stems from the complexity of current law. If we simplified current law and moved it closer to a Haig-Simons tax, individuals could and would adjust. The failure to adjust would then be similar to the realization rule and other problems with current law – it would not affect our thinking about the Haig-Simons ideal.

Suppose, however, that the adjustments are too difficult even in a Haig-Simons tax. If this is the case, an income tax leaves individuals in a bad spot. To maximize utility, it forces them to make portfolio adjustments but the adjustments are too hard to make.

Perhaps these individuals are blissfully ignorant. The government, through the tax system is absorbing risk that they thought that they were taking but they do not know it. These individuals, however blissfully ignorant when they invest, will be disappointed ex post. They will not turn out to have the set of returns that they thought they had.

We can increase their (ex post) utility, however, by implementing a tax that is equivalent to a Haig-Simons tax (with portfolio adjustments) but does not require portfolio adjustments. Individuals under such a tax would not need to understand or make the adjustments that they would want to make under a Haig-Simon tax.

For example, wealth taxes may not require adjustments in response to taxation. A wealth tax is fixed, ex ante, before the outcomes of risky bets are known. For example, suppose an individual has $100 and invests in our running example, an asset with a 50% chance of being worth $130 and a 50% chance of being worth $90. A 2% wealth tax would reduce his wealth to $98 regardless of how the bet turns out. If the risk-free rate were 4%, the 2% wealth tax would be the same as a 50% Haig-Simons tax with portfolio adjustments.[84] No portfolio adjustments would be needed, however, because the tax does

[84] This is not strictly true because the taxes are imposed at different times. The wealth tax would have to equal the present value of the income tax. In the case in the text, the wealth tax rate would be equal to 2%/(1+r) where r is the risk-free rate of return.

not nominally apply to risky returns so there is no need to adjust portfolios to offset the nominal tax.[85]

If individuals cannot understand the required adjustments under an income tax, we should think about switching to an equivalent tax that does not require individual portfolio adjustments. The same holds for cash flow consumption taxes and wage taxes. Much like in the case with the imperfect tax system, the model makes the link between hypothetical systems, allowing us to make better informed policy choices.

Transactions costs. The same logic applies if transactions costs prevent individuals from adjusting their portfolios. Like in the complexity case, there is no reason to believe that individuals start from a pre-tax world and then buy and sell securities to adjust for taxes. Instead, they always live in an after-tax world and probably initially purchase securities based on the risk and returns they get in that world. Transactions costs should not prevent individuals from setting their portfolios to eliminate the effect of the tax on risk.[86]

The only place transactions costs matter is when tax rates change. For example, suppose tax rates change rapidly from, say, 70% to around 30%, roughly the change in rates in the Reagan years. Individuals in such circumstances would find themselves with too much risk because the government no longer shares risk through taxation as much as before. They would have to reduce their risk positions and transactions costs might make this a slow process. (This is, in fact, the criticism Poterba and Samwick makes of the Scholz study – transactions costs might slow the adjustments sufficiently that they do not show up in the years Scholz examined.)[87]

To the extent we are concerned about the effect of large tax rate changes, we can set up a system equivalent to an income tax except that it does not require adjustments when rates change. As discussed above for complexity, we might want to consider a wealth tax or Auerbach's retrospective tax. Alternatively, we might want to think about ways to

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[85]This conclusion may not hold for wealth taxes imposed periodically. See Weisbach, Periodic Taxation, draft. The portfolio adjustments under a periodic wealth tax, however, would be substantially smaller than under a periodic income tax.

[86]The overall size of taxpayer's positions would be larger under a Haig-Simons tax than in, say, a no-tax world. If transactions costs relate to the size of taxpayers' positions, transactions costs may be present. For example, if brokers charge a fee based on the size of the transaction rather than per transaction, commissions might be higher.

[87]See Poterba and Samwick, note __.

adjust tax rates that reduce the need for portfolio adjustments.[88] Regardless of which approach we take, the existence of transactions costs in slowing portfolio adjustments in response to rate changes may increase rather than reduce the value of the taxation and risk literature because that literature can help us think through how to set up the tax system to reduce the utility losses due to transactions costs.

Framing. Framing effects or other psychological problems might prevent individuals from making adjustments. Presented with identical opportunity sets framed differently, they might perceive them to be different and behave differently. Therefore, showing that a tax on risk-free returns and a Haig-Simons tax give individuals identical opportunity sets is not sufficient to show that individuals will behave the same under the two taxes.

The difficulty in analyzing this case is that we can no longer easily do welfare analysis. Individuals would be behaving inconsistently, and we could not take their actions in any given state of the world as reflecting their preferences. Given the same opportunity set and different behaviors, how are we to know which the individual really prefers?

Although there is no standard procedure in this case – behavioral economics has remained staunchly positive to avoid this problem – one possibility is to impose a set of rules that is least likely to be subject to the psychological quirk. That is, we would choose a set of rules under which individual would behave in a way that is consistent with rational behavior. A similar alternative approach is to pick a set of rules that induces behavior that individuals are least likely regret as foolish ex post.[89] For example, if there is something particularly difficult about calculating after-tax returns from pre-tax returns and making adjustments, we can give them an equivalent tax system that does not require such calculations. If individuals were able to understand their framing problems, they would act under an income tax exactly like they do under a wealth tax. We can try to educate individuals to get around the framing effect or we can just give them the wealth tax. Or the argument might go in the other direction, depending on how the psychological effects enter. The key, however, is that the equivalence under rational behavior is helpful to thinking about the problem under irrational behavior.

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[88]For example, if tax rate changes apply only to new positions, adjustments would be unnecessary.

[89]Neither of these approaches is without problem. Both privilege one viewpoint, rationality or ex post regret, over another viewpoint. But given the underlying inconsistency, there is no way to make policy (at least policy that at is at least partially based on individual preferences) without doing so.

Unique Assets. A final reason individuals might not adjust to the nominal taxation of risky returns is that they own unique or illiquid assets and cannot purchase more than a set amount. For example, they might have all of their wealth tied up in a closely held business. If they cannot adjust to the nominal taxation of risky returns, the tax system will end up absorbing some risk. What we think of this depends on why the individual holds the unique or illiquid asset.

One reason for holding a large concentrated position in a risky asset is to limit moral hazard problems. Holding a concentrated position in an asset may reduce incentive problems created by moral hazard. If the tax system forces the individual to bear less risk by absorbing both the upside and downside returns, the moral hazard problem is made worse. The combination of the nominal tax on risk and moral hazard creates social losses.

The other major reason for holding a large concentrated position is adverse selection. For example, asymmetric information may prevent an individual from selling pieces of his business. In this case, the tax system promotes welfare by allowing the individual to partially self-insure by not adjusting his portfolio.

Which of these dominates is not clear. It is also not clear whether other mechanisms could solve adverse selection problems without creating moral hazard problems. If adverse selection problems are dominant and if there are no other better methods of solving them, an ex post tax that absorbs risk may be a good solution. A cash flow consumption or a Haig-Simons income tax would probably work equally well. In the absence of adjustments, both would tax the return to risk-taking. Both also have potential to create moral hazard problems. If moral hazard problems are dominant, ex post taxes may make them worse. Ex post taxes may still be justified because of their ability to tax inframarginal returns, but the increase in moral hazard problems would be a cost.

Summary

In sum, the arguments about the cases where individuals do not adjust their portfolios, to the extent they are believable, mirror the arguments where the tax system is different from the one modeled. The models tell us something about an ideal world which is helpful in setting policy in our less than ideal world. Claiming that individuals do not adjust as in the models is not a claim that we can ignore the models and support the status quo. Moreover, it is not clear that we should blindly assume individuals do not adjust their portfolios. We assume without question that individuals would adjust under a cash flow tax and the adjustments under a cash flow tax are essentially identical to those

under an income tax. Individuals spend their life in an after-tax world and there no reason to believe that they are tailoring their risks to that world.

C. *The Government Doesn't Adjust its Portfolio*

Potential Problem

The taxation and risk models requires the government to adjust its portfolio by selling securities and investing in risk-free assets. Absent this adjustment, markets may not clear at existing prices, which means individuals may not be able to make the required portfolio adjustments. In addition, the pattern of tax revenues will vary depending on the tax system chosen, which defeats the equivalences.

The government portfolio position is complex. The Federal government has vast positions in land, indirect positions in the housing market through government guarantees, in the labor market through unemployment insurance, in the medical market through Medicare, and (short positions) in the debt market through its borrowing. Nevertheless, casual observation suggests that the government does not appear to behave as required in the models. Although we cannot be sure of the reasons, the most plausible reason is that we do not want the government either directly owning or selling short large numbers of securities (as opposed to having an indirect stake in them through the tax system). The government would become the dominant market participant and we might, for example, be concerned about how it would use this influence.[90]

This section considers how views about government portfolio behavior should affect the conclusions from the model.[91] Before turning to that discussion, note that the problem of government adjustments is *exactly the same* in a Haig-Simons income tax and a cash flow consumption tax. In both cases, government portfolio adjustments are needed for the basic equivalences (such as a cash flow tax being equal to a zero tax) to hold. The discussion of government portfolio adjustments, therefore, cannot help distinguish between income and consumption taxes – arguments that the taxation and risk literature for income tax is not correct because of the lack of government portfolio adjustments

[90]One has to be careful in making this argument. The combination of the government portfolio adjustment and the tax system makes the government indifferent to market performance. An objection to government portfolio adjustments would have to argue that government exposure to the market, which is what it gets when it imposes an income tax and does not make portfolio adjustments, is appropriate.

[91]The only other author to discuss government portfolio adjustments is Kaplow, note 3. Much of the discussion here follows from his analysis and from his comments on an earlier draft of this paper.

would apply equally to the Cary Brown theorem for cash flow taxes. Instead, the discussion distinguishes between taxes nominally imposed on risk, where individuals must adjust their portfolios and taxes not nominally on risk.[92]

The existence or non-existence of government portfolio adjustments, therefore, will not alter many of the ultimate conclusions of the taxation and risk literature. The difference between income and consumption taxes will still be the risk-free rate of return. Other conclusions, however, might change. For example, the deadweight loss from mismeasurements or the problems with inflation might be different if there are no government adjustments.

The necessity of some type of adjustment

Although casual observation suggests that the government does not make portfolio adjustments, there are good reasons to believe that in fact it does and must make adjustments. To see this, suppose that there is a tax regime, a corresponding set of government portfolio positions (which could be not having any explicit portfolio), and a set of spending programs. Suppose also that the government budget with this regime is in long-term balance. Borrowing can shift tax receipts across periods, but in the long run, government inflows must equal outlays. For example, if taxes are low, say because the economy is doing poorly, the government must either raise taxes or cut spending.

Now suppose that the tax regime is changed but nothing else changes. Because the tax regime has changed, in some states the world, the new tax regime will bring in more money than the old regime and in some states, the new tax regime will bring in less. This means that the government budget is no longer in balance. Because the government budget must be in long-term balance, this state of affairs is not an equilibrium. If the new tax regime is to remain and if spending is to remain fixed, the government must adjust its portfolio to maintain budget balance. A pure "no adjustment" position is unsustainable.

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[92]For example, government portfolio adjustments might affect views of so-called "prepaid" savings accounts and post-paid savings accounts. In a pre-paid savings account, such as the current law "Roth IRA," individuals may not deduct contributions but no tax is paid on withdrawals – the nontaxation of capital is explicit. In post-paid accounts, such as traditional IRA's, individuals may deduct contributions but are taxed on withdrawals. Post-paid accounts are effectively cash-flow taxation and require portfolio adjustments. Pre-paid accounts do not require portfolio adjustments. For a discussion of pre-paid and post-paid systems, see David F. Bradford and the U.S. Treasury Tax Policy Staff. Blueprints for Basic Tax Reform, (2d. ed., revised, 1984).

Borrowing should not change this result. The government can borrow to smooth spending across states of nature but ultimately, any borrowing reflects the risky returns in the tax system. For example, suppose that in Tax Regime 1, the government receives $1 in each period and that in Tax Regime 2, the government receives either $0 or $2 in each period, depending on the performance of risky assets. The government can borrow in Tax Regime 2 when taxes are $0 to even out its cash flows. The borrowing, however, would be equivalent to selling the risky asset short. The reason why is that the borrower only gets paid off if next period taxes are $2. The debt is entirely dependent on risky flows. It is effectively equity that the government has sold short, just as the model requires. If the underlying flows are risky, borrowing will be risky.[93] Borrowing, therefore, cannot change the basic equivalences and the need for some type of adjustments when tax regimes change.

Conclusions if the government does not adjust its portfolio

This analysis suggests that the government would have to adjust its portfolio after a significant tax change, (or alternatively, change spending to correspond to the tax change). The central question then is how an argument that governments must adjust their portfolio can be reconciled with the casual (and likely correct) observation that our current government does not seem to make the adjustment predicted by the models.[94]

The answer is that the models only require the government to adjust its portfolio if it changes tax regimes. Thus, the models would predict that if we switched to, say, a wage tax, the government would have to purchase equities to offset the reduction in equity exposure it has under current law through the income tax (or change its spending patterns). Nothing in the models requires it to take a particular portfolio position under a given tax system. Instead, the models merely show equivalences of different tax systems with government portfolio adjustments.[95]

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[93]The borrowing fully reflects the riskiness of the underlying flows because, by assumption, government spending was held constant across tax regimes. The government cannot, for example, sell assets to pay off the borrowing.

The government could attempt to pay off the debt by printing money, but the resulting inflation would be equivalent to a tax change, which breaks down the equivalence.

[94]As noted, actually determining the government portfolio is not easy. The government portfolio is very complex and casual observation may not be sufficient to determine how it behaves.

[95]For example, the model in Kaplow note 3, does not require the government to start with any particular portfolio. Instead, it merely shows the equivalence of tax regimes with a portfolio shift.

For example, we might not see the government selling assets short because the government's preferred position might be to have the equity exposure that comes with an income tax. Only if we switched to a tax that did not give this equity expose, such as a wealth tax or a wage tax, we would expect to see government adjustments. Thus, the lack of observable adjustments does not destroy the basic equivalences. Instead, it merely shows what the government's preferred position is.

We can see this point more formally with simple algebra. The models show that a Haig-Simons income tax with the proper portfolio adjustments is equivalent to a tax on the risk-free rate of return or a wealth tax:

Income tax + government adjustments = wealth tax

By rearranging the equation, we can see that a Haig-Simons tax without portfolio adjustments (as hypothesized) is equivalent to a wealth tax with the opposite adjustments (borrowing money to purchase equity positions):

Income tax = wealth tax - government adjustments

Thus, we can consider the failure of the government to adjust under an income tax by selling risky assets as the equivalent as a decision to impose a wealth tax and purchasing risky assets. We would predict that if spending patterns were held constant, if the government shifted to a wealth tax it would have to purchase risky assets.

An equivalent approach is to consider the effect of changing tax regimes under the assumption that the government will not adjust its portfolio. The advantage of this approach is that it does not require assumptions about current government portfolio policy. Instead, one need only believe that whatever the policy, it would not change with a tax law change. Suppose, then, that the government is going to switch from an income tax to a wealth tax. Such a switch is identical to a switch in government portfolio policy. To see this, rearrange the equation:

Wealth tax - Income tax = Portfolio adjustments

That is, the difference between a wealth tax and an income tax is simply the government portfolio adjustments. Government portfolio adjustments can be a perfect substitute for major changes in tax regimes. Therefore, a decision to change the tax base between an income and wealth should be made on the same arguments one would make to argue for a change in government portfolio policy. Leaving aside administrative costs, the decision is not a tax decision, it is a government portfolio decision.

We can take this still one step further. Suppose that we restrict direct government portfolio policy for a nontax reason. For example, we might be concerned about the government directly owning or shorting securities. Moreover, there may be good reasons that some securities, such as ownership interests in small businesses are not tradeable so that the government cannot buy or sell these securities directly in the market. If true, we can view the choice between equivalent tax policies as a method if indirectly choosing government portfolio policies that cannot be chosen directly. For example, the choice of an income tax over a wealth tax is a choice that the government should have an equity stake in the markets. A choice of a wealth tax instead of an income tax is a choice that it should not.

The same arguments apply to the choice of forms of consumption taxes. Cash flow consumption taxes with government portfolio taxes impose a zero rate of tax on capital income. Therefore, they are equivalent to wage taxes.

Cash flow tax + Portfolio adjustments = Wage tax

Rearranging the equation, as above, shows that in the absence of direct portfolio adjustments by the government, the choice between cash flow taxes and wage taxes can be thought of as choice of government portfolios. A cash flow tax without adjustments is equivalent to imposing a wage tax and borrowing to purchase equity.[96]

The failure of the government to adjust its portfolio, therefore has some effect on the conclusions. If the government cannot adjust its portfolio, there might be grounds for picking between equivalent tax policies other than pure administrative costs. But the core conclusions remain. In particular, the failure of the government to adjust its portfolio has no effect on the conclusions regarding the choice between and income tax and a consumption tax.

IV. Conclusion

Understanding how or whether income taxes tax returns to risk should have dramatic effects on our understanding of tax systems. It has the potential to overturn what were once thought to be deep philosophical arguments about an important problem. We cannot claim to fully understand income and consumption taxes without coming to grips with this literature.

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[96]This conclusion can be found in the literature describing a cash flow tax as a form of mandatory government partnership in all projects. See [cites]. Herwig Schlunk makes a similar argument in the context of an income tax. See Herwig Schlunk, The Cashless Corporate Tax, 55 Tax L. Rev. 1 (2001).

The models of taxation and risk are highly simplified abstractions of the actual tax system and of individual behavior. I have argued that here that this does not change the core value of the models. Arguments about tax systems are often about ideals and the models teach us about these ideals. Those who argue for an income tax usually hold the Haig-Simons tax is an ideal, unreachable because of administrative costs, but an ideal nonetheless. The models tell us that this ideal may not tax the things we thought it did.

Notwithstanding their value as they are, the models can be further developed. Obviously, we can make them better track current law. Doing so would help in understanding how current law deviates from the ideal and would, in a sense, be a separate undertaking from the uses of the models discussed here.

Even as models of ideal systems, however, the models can be refined. For example, current models generally only use two periods. It is not obvious how they apply to taxes that are imposed periodically, as existing and Haig-Simons taxes do.[97] Current models also do not take into account uncertainty about future tax rates. We do not understand how individuals would set their portfolios of take this risk into account.

Finally, we might ask why, if the models are right, do people seem to care so much about taxes. Tax shelters are a big business. Taxes, and particular, the taxation of the wealthy, is a major political topic. The models would seem to suggest that this emphasis is wrong – taxes on wealth matter very little.

There might be several reasons. For example, current law may impose significant burdens that an ideal income tax would not. Merely complying with current law is difficult. Loss restrictions and non-neutral tax rates create incentives, and sometimes the need, to engage in tax planning. In addition, there may be transition effects from tax rate changes. Those who hold assets when rates go down may reap windfalls. Advocating for tax changes may be a way of advocating for such windfalls. The taxation and risk models, in their present form, do not help analyze these issues and further refinement of the models would be helpful.

These topics and others need to be better understood. We cannot yet say that the effects of taxation on risk taking, even under a perfect Haig-Simons tax, are known. Nevertheless, existing models provide substantial insights into the nature of Haig-Simons tax systems, wealth taxes, and consumption taxes. This is true notwithstanding that they

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[97] See David Weisbach, Periodic Income and Wealth Taxes, manuscript, for an initial exploration of these issues.

assume a simple, idealized tax system and rational individuals responding to the incentives such a system imposes.

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