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Taxation and Liquidity

ABSTRACT. One of the principal determinants of an asset's return is its liquidity—the ease with which the asset can be bought and sold. Liquid assets yield a lower return than do otherwise comparable illiquid assets. This Article demonstrates that an income tax alters the tradeoff between asset liquidity and yield because: (1) high yields from illiquid assets are taxed; (2) imputed transaction services income from liquidity is untaxed; and (3) illiquidity costs are only sometimes deductible. As a result, assets have more liquidity and the price of liquidity in terms of yield is higher than it would be in the absence of an income tax. These distortions foster an excessively large financial sector, which exists in large part to create (tax-favored) liquidity. The tax wedge between liquidity and yield also creates clientele effects, in which low-rate taxpayers, such as nonprofit institutions, hold illiquid assets regardless of their liquidity needs. The liquidity/yield tax distortion also offers a new perspective on fundamental questions in federal income tax, such as the desirability of the realization requirement, preferential capital gains tax rates, and corporate taxation. These elements of the income tax mitigate or even negate the pro-liquidity tax bias identified in this Article.

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INTRODUCTION

Asset returns depend upon the liquidity of a security.[1] Cash, for example, yields no financial return, but investors are nevertheless willing to hold cash as part of their portfolios. Cash provides transaction services, enabling investors to consume quickly and easily. The connection between liquidity and asset returns demonstrates that the standard model in which asset returns are determined by a tradeoff between risk and return is, at best, incomplete. Indeed, the liquidity/return tradeoff provides a better explanation for the behavior of asset prices during the financial crisis of 2007-2009 than standard risk/return based theories can offer.[2]

Tax scholars have examined the implications of risk/return tradeoffs for the appropriate taxation of assets for over fifty years.[3] Scholars have also examined the impact of imputed income from real assets, such as housing, on the ownership of real versus financial assets.[4] The tax academy has almost entirely

1. Liquidity is defined as the "ease of trading a security." *See* Yakov Amihud, Haim Mendelson & Lasse Heje Pedersen, *Liquidity and Asset Prices*, *in* 1 FOUNDATIONS AND TRENDS IN FINANCE 269, 270 (2005) [hereinafter *Liquidity and Asset Prices*]. Some assets, such as stock in large companies, are considered liquid in that they can be sold quickly and easily and for a relatively small commission. Houses, by contrast, are considered illiquid assets. Selling a house typically requires a long selling period and the payment of considerable fees and "closing costs" to brokers, lawyers, banks, and so on.

2. *See* David Adler, *A Flat Dow for 10 Years? Why It Could Happen*, BARRON'S, Dec. 28, 2009, at 24.

3. Evsey D. Domar & Richard A. Musgrave, *Proportional Income Taxation and Risk-Taking*, 58 Q.J. ECON. 388 (1944). For a recent example reviewing the literature on the true nature of risk taxation, see David A. Weisbach, *The (Non)Taxation of Risk*, 58 TAX L. REV. 1 (2004). *See also* Adam H. Rosenzweig, *Imperfect Financial Markets and the Hidden Costs of a Modern Income Tax*, 62 SMU L. REV. 239, 241-43 (2009) (discussing how risk/return tradeoffs may subsidize trading in financial derivatives).

4. *See, e.g.*, JOSEPH M. DODGE ET AL., FEDERAL INCOME TAX: DOCTRINE, STRUCTURE, AND POLICY 80 (2d ed. 1999) ("[E]conomists would argue that imputed income from consumer assets should be taxed on neutrality grounds: Excluding such imputed income creates excessive demand for consumer assets as opposed to savings and investments."). See also Joseph Bankman, Commentary, *What Can We Say About a Wealth Tax?*, 53 TAX L. REV. 477, 481-82 (2000); Deborah H. Schenk, *Saving the Income Tax with a Wealth Tax*, 53 TAX L. REV. 423 (2000); and Jeff Strnad, *Periodicity and Accretion Taxation: Norms and Implementation*, 99 YALE L.J. 1817, 1834-39 (1990), for discussions of the possibility of imputed income from financial assets. The imputed income discussed in these articles, called "intangible benefits" by Strnad, differs from liquidity along several dimensions. First, the value of such imputed income has a much less solid empirical foundation than the value of liquidity. For example, Strnad describes the intangible benefits of wealth, which may include "security, prestige and power," as "very hard to observe or estimate." Strnad, *supra*, at 1833, 1835; *see also* Louis Kaplow, *Utility from Accumulation* (Nat'l Bureau of Econ. Research, Working Paper No.

overlooked, however, the tax implications of the liquidity/return tradeoff.[5] This Article begins an examination of the interaction of an income tax on individual investors with the liquidity/return tradeoff.[6]

Suppose that an investor faces a choice about the type of assets that she should hold. The investor can hold cash and receive no return or hold assets in an illiquid form, such as real estate, and earn 10% interest annually. If the investor holds cash, then she pays for consumption with cash. If the investor holds real estate, then she pays for consumption with a credit card (she has no cash) and pays 10% interest on her credit card borrowings. Without an income tax, the investor is indifferent between holding cash or holding illiquid real estate. Either holding enables her to purchase the same amount of consumption and leaves the same amount of wealth. Cash yields no return, but it obviates the need to use a credit card and to pay interest to purchase consumption. This benefit offsets cash's lack of return.

Under the federal income tax, however, the investor's preferences change. If income taxes are 50%, then the investor pays income tax equal to 5% of the value of the real estate (50% of real estate's 10% return) but no income tax on cash. Moreover, the interest paid on credit card debt cannot be deducted.[7] After taxes, holding real estate no longer enables the investor to purchase the same amount of consumption as holding cash does. As a result, the investor prefers to hold cash rather than real estate.

This example demonstrates how income taxes distort the choice between liquid and illiquid assets. The extent of the distortion depends upon the tax treatment of the costs of illiquidity and the benefits of liquidity. In the example, the investor prefers cash to illiquid assets because part of cash's "return" (in the form of making purchases cheaper and easier) goes untaxed,

15595, 2009), *available at* http://www.nber.org/papers/w15595 (describing accumulation as a benefit of wealth). The value of liquidity, by contrast, finds robust empirical documentation, as discussed in Part II. Second, the imputed income from liquidity varies from asset to asset and can be produced at a cost. The intangible benefits approach, by contrast, does not include the possibility that financial asset intangible benefits have an upward-sloping supply curve. As a result, failure to tax intangible benefits causes very different distortions from the failure to tax liquidity.

5. Exceptions to this rule include Michael S. Knoll, Commentary, *Of Fruit and Trees: The Relationship Between Income and Wealth Taxes*, 53 TAX L. REV. 587, 592-93 (2000); and Rebecca S. Rudnick, *Who Should Pay the Corporate Tax in a Flat Tax World?*, 39 CASE W. RES. L. REV. 965, 1099-1143 (1988), discussed below in notes 105 and 108.

6. Except where explicitly noted, this Article examines the taxation of liquidity from the perspective of an individual investor making investments subject to income tax rather than from the perspective of a business investor, a corporation, or investors making investments in tax-preferred retirement accounts.

7. I.R.C. § 163(h) (2006).

while the extra consumption costs (having to pay credit card interest) associated with real estate are nondeductible.

The size and direction of the distortion between liquid and illiquid assets depend upon the income tax treatment of the costs associated with converting illiquid assets into consumption. If either the costs associated with illiquidity are fully deductible (for example, deductibility of credit card interest) or the benefits associated with liquidity (ease of buying consumption) are taxed, then the tax code does not distort the choice between liquid versus illiquid assets. But the most reasonable characterization of the U.S. income tax does not meet either of these conditions.[8] The benefits associated with liquidity go untaxed while the costs of illiquidity are deductible only sometimes. As a result, the income tax distorts investment choices toward liquid assets and away from illiquid assets. The size and scope of the distortions depend upon the characteristics of the market for liquidity, including how much liquidity costs to supply and how valuable liquidity is to investors.

The tax preference for liquidity potentially explains a portion of the proliferation of securitization in the economy. While it is very costly to sell an individual asset such as a mortgage, it is much cheaper, under many circumstances, to sell a securitized package of assets.[9] Securitization enhances liquidity, creating a market for packages of assets that does not exist for individual assets. Securitization also entails costs, however, such as the moral hazard created when those issuing mortgages no longer bear the entire default risk of the mortgage. Theory predicts that securitization should occur when its benefits in the form of liquidity (and risk diversification) exceed its costs. If the liquidity benefits of securitization are untaxed while the higher returns of illiquid unsecuritized assets are taxed (and the costs associated with this illiquidity cannot be fully deducted), then assets will be oversecuritized.

Securitization is simply one way in which the financial sector produces liquidity. Securitization, public equity markets, and many other elements of financial intermediation facilitate connections between buyers and sellers of capital, thereby making capital exchange more rapid and less expensive—and thus more liquid. If such liquidity goes untaxed, then it will be overproduced and the financial sector will become overgrown as one of its primary outputs—liquidity—is tax-favored.[10] By contrast, other features of the income tax that

8. *See infra* Part II.

9. Securitization also enables some diversification of risk. This aspect of securitization will be discussed below. *See infra* Subsection III.A.2.

10. An analogous argument has been made many times with respect to the housing sector. Because imputed income from housing is untaxed, there is overinvestment in housing. *See, e.g.*, THE PRESIDENT'S ADVISORY PANEL ON FED. TAX REFORM, SIMPLE, FAIR, AND PRO-

favor illiquidity, such as the realization requirement, reduce the size of the financial sector.

The asymmetric taxation of liquid and illiquid assets also distorts the identity of the owners of assets—a distortion known as a clientele effect. Without taxation, patient asset-holders who are unlikely to need liquidity should hold illiquid assets while those more likely to need cash should hold liquid assets. Because of the asymmetric taxation of liquid and illiquid assets, however, low-rate taxpayers collect rents from holding high-return illiquid securities, encouraging them to hold these securities regardless of their cash needs. Tax preferences, along with the oft-argued notion of "long-term horizons," may explain some part of why untaxed university endowments disproportionately hold illiquid high-yielding assets.

After examining the inefficiencies caused by asymmetric taxation of liquid and illiquid assets, I consider possible solutions to these distortions. The asymmetry could be eliminated in one of two ways. Either the costs of illiquidity could be made more easily deductible, or the benefits of liquidity could be taxed. Which approach is better depends upon the appropriate definition of income. If we view liquid assets as providing imputed income in the form of transaction services, then the benefits of liquidity should be taxed. If, however, we view the costs of illiquidity as properly deducted to determine net income, then the costs of illiquidity should be deductible.

Under either view, the asymmetry of taxation between liquid and illiquid assets should be eliminated. If the appropriate definition of income requires subtraction of the costs of purchasing consumption, then the asymmetry should be eliminated by allowing deductibility of illiquidity-related costs. Interest on personal borrowing, losses associated with selling illiquid assets, and opportunity costs associated with converting illiquid assets into consumption should all be deductible from tax. The distortion between liquid and illiquid assets may also be mitigated or eliminated by offsetting preferential treatment for illiquid assets. Many oft-criticized idiosyncrasies of the U.S. income tax system, such as the realization requirement and the preferential treatment of capital gains, implicitly tax illiquid assets at a lower rate than liquid assets. These elements of the tax code mitigate, and may even eliminate, the pro-liquidity asymmetries identified in this Article, albeit in an ad hoc and probably inefficient fashion.

GROWTH: PROPOSALS TO FIX AMERICA'S TAX SYSTEM 70 (2005), *available at* http://www.taxpolicycenter.org/taxtopics/upload/tax-panel-2.pdf ("[T]here is a question whether the tax code encourages overinvestment in housing at the expense of other productive uses.").

If the appropriate definition of income includes the transaction services of liquid assets, then the distortion between liquid and illiquid assets should be eliminated by taxing these imputed transaction services. In a wealth tax, for example, assets with the same value receive the same treatment, regardless of whether the asset's value derives from its efficacy for purchasing consumption (as with liquid assets such as cash) or from its high yield (as with illiquid assets such as real estate). This symmetry of treatment is not unique to a wealth tax. Any form of ex ante expected income taxation, such as a retrospective capital gains tax, also eliminates the distortion between liquid and illiquid assets introduced by the current tax code. The corporate tax may similarly be viewed as a tax upon the liquidity created by becoming a publicly traded company. As with the realization requirement and preferential rate for capital gains, however, the corporate tax is at best only a partial corrective to the distortions created by asymmetric taxation of liquid and illiquid assets.

This Article proceeds as follows. Part I reviews the voluminous finance literature demonstrating that there is a tradeoff between liquidity and yield. Part II examines the consequences of taxing yield—but not liquidity—in markets with various characteristics and identifies distortions that are created when return is taxed but liquidity is not. Part III applies the lessons of Part II to "free checking accounts" offered by banks, securitization markets, and asset holdings by nonprofit organizations, and demonstrates that the distortions between liquid and illiquid assets examined may be extremely important for the economy. Part IV considers elements of the income tax, such as the realization requirement, that may mitigate the tax asymmetry favoring liquidity. It also considers alternative solutions to the asymmetry, such as wealth taxation and enhanced deductibility of illiquidity costs.

I. ASSET PRICES AND LIQUIDITY

A considerable body of both theoretical and empirical evidence demonstrates that the liquidity of an asset is an important determinant of its return, with more liquidity being associated with a lower return. This Part sketches the theoretical and empirical evidence for this relationship.

A. The Theoretical Basis for a Tradeoff Between Returns and Liquidity

Liquidity is "the ease of trading" an asset.[11] An asset may be easy or difficult to trade for two related reasons. First, there may be exogenous selling costs.

11. *Liquidity and Asset Prices*, *supra* note 1, at 270.

For example, it may be impossible to sell certain assets without the investment of considerable time, considerable effort, and the recourse to a broker or some other agent who charges a fee for her services.[12] Second, assets may be hard to sell because of demand pressure and inventory risk factors.[13] Simply put, when an individual wants to sell an asset, the price that the individual receives reflects not only the expected future cash flows from the asset but also the number of parties who want to buy and sell the asset at the given time. If one tries to sell at a time when there are many sellers but few buyers, the price will be lower than the value of expected future cash flows, introducing another cost of selling. Of course, the individual could choose not to sell the asset if the market conditions for selling it seem unfavorable. Holding onto the asset, however, prevents the individual from shifting assets when she might desire to do so. If an asset is prone to high transaction costs and high demand pressure risks, then the asset is considered illiquid.

The ability to sell an asset whenever one desires without incurring a large cost is a desirable trait for investors. Investors may be subject to liquidity shocks. Individuals may lose their jobs, for example, and need to liquidate assets to fund ordinary consumption that was formerly funded by their labor income, or individuals may need liquid assets to facilitate transactions from vendors who demand payment with liquid assets.[14] Entrepreneurs may come across temporary investment opportunities that require the sale of assets to obtain the necessary capital. Large investment groups such as hedge funds may borrow money for investment and may be required to post collateral to continue trading. If the investment group's collateral suffers a decline in value,

12. *See id.*

13. Market makers mitigate the cost of demand pressure but require some compensation to do so. For example, if there are no buyers for a particular stock, then an investment bank may purchase the stock and hold it for a brief time until a buyer comes along. The greater the demand pressure problem—the higher the risk for the investment bank that a buyer will not come along or that they will have to sell the stock at a loss—the greater the compensation demanded by market makers.

14. The cost/benefit analysis of holding cash is the subject of the Baumol-Tobin model of money demand. The benefit is considered the provision of transaction services, and the cost is the foregone yield from holding other assets. *See* William J. Baumol, *The Transactions Demand for Cash: An Inventory Theoretic Approach*, 66 Q.J. ECON. 545 (1952); David Romer, *A Simple General Equilibrium Version of the Baumol-Tobin Model*, 101 Q.J. ECON. 663 (1986); James Tobin, *The Interest-Elasticity of Transactions Demand for Cash*, 38 REV. ECON. & STAT. 241 (1956). The Baumol-Tobin model demonstrates that the tradeoff between liquidity and return is not simply a recent invention of academic finance.

the investment group may be required to post new capital by liquidating some assets.[15]

The inevitability of costs associated with owning assets introduces two separate measures of asset returns. The "absolute" return of an asset is the asset's return before considering any costs associated with owning the asset. The "residual" asset return is the return associated with the asset after accounting for all costs associated with owning the asset and acquiring consumption. These costs will be termed "illiquidity costs."[16] Illiquidity costs include transaction costs incurred in selling the asset (including the opportunity cost of time and energy involved in selling the asset, as well as the direct transaction costs paid to those providing financial services), the costs of acquiring substitute sources of cash for consumption if an illiquid asset is held, and the costs of occasional non-consumption of a desired good when liquidity is unavailable at a reasonable price. In mathematical terms: *Absolute Return - Illiquidity Costs = Residual Return*.

An illiquid asset with high illiquidity costs is characterized by a large difference between absolute and residual returns, while a liquid asset is characterized by a small difference. In the example from the Introduction, the absolute return from holding real estate is 10% annually, while the absolute return of cash is 0%. The residual return for both assets is 0%. The 10% absolute return of holding illiquid real estate is reduced to a 0% residual return by the incurrence of 10% annually in (credit card) costs for purchasing consumption.

Residual returns for identical assets can vary across investors. Investors who rarely need to convert assets into consumption have lower illiquidity costs, and higher residual returns, than investors with the same assets who are more likely to have to liquidate.

There are two primary models for analyzing the impact of illiquidity on absolute and residual returns. They differ in their assumptions about investors attitudes toward risk. The first model assumes that investors are risk-neutral but subject to liquidity shocks—periods in which additional consumption is

15. *See* Markus K. Brunnermeier & Lasse Heje Pedersen, *Market Liquidity and Funding Liquidity*, 22 REV. FIN. STUD. 2201 (2009) (focusing on the interaction between market liquidity and the need for investment groups to post collateral).

16. In *Liquidity and Asset Prices*, *supra* note 1, at 288, the absolute return is termed the "gross" return, while the residual return is called the "net" return. Because the terms "gross" and "net" have very different meanings in the income tax context, I prefer to use the words "absolute" and "residual" to avoid confusion.

desired.[17] A liquidity shock is an idiosyncratic need for consumption in a given period, not correlated with any systematic risk in the economy. Because investors are risk-neutral in this model, the marginal value of consumption in a liquidity shock is the same in all states of the world. Holding illiquid assets is not inherently problematic for investors, but investors will demand a higher absolute return from illiquid assets to compensate them for the costs associated with illiquidity. Investors are therefore willing to hold illiquid assets if the residual returns of liquid and illiquid assets are equal. Thus, expected absolute returns increase in a one-for-one manner with expected illiquidity costs. Illiquid assets have a higher absolute return but the same residual return as liquid assets.[18] In this model, there is an illiquidity premium in absolute returns, but not in residual returns, after accounting for the higher costs associated with illiquid assets.

Alternatively, suppose that investors are risk-averse; they reject fair gambles. When investors have lower consumption, they get more benefit from each increment of consumption. Assume further that investors' need to sell an asset is correlated with their amount of income; investors need to sell an asset when times are bad, and they have low ability to purchase consumption from present income. Moreover, assume that investors cannot borrow at a reasonable cost against the long-term value of their asset instead of selling the asset. Under these assumptions, illiquid assets are particularly undesirable. Investors must sell assets and incur high transaction costs (and thus low residual returns) precisely when their need for consumption is highest. To compensate investors for the fact that illiquid assets' residual returns are lowest when their value is highest, illiquid assets must offer an illiquidity premium in both absolute and residual returns.[19]

17. Risk neutrality implies that the marginal utility of a dollar of consumption is constant, regardless of the level of consumption. *See* Milton Friedman & L.J. Savage, *The Utility Analysis of Choices Involving Risk*, 56 J. POL. ECON. 279, 294 (1948).

18. *See* Yakov Amihud & Haim Mendelson, *Asset Pricing and the Bid-Ask Spread*, 17 J. FIN. ECON. 223 (1986); *Liquidity and Asset Prices*, *supra* note 1, at 281.

19. *See* Ming Huang, *Liquidity Shocks and Equilibrium Liquidity Premia*, 109 J. ECON. THEORY 104 (2003). Note that this illiquidity premium persists even if the asset's absolute return is not correlated with the market (the conventional measure of beta in the Capital Asset Pricing Model (CAPM)). This is because the important measure of return from the investor's perspective is the residual return. Even if the asset's absolute return does not covary with the market, the illiquidity costs and thus the residual return may nonetheless covary with the market if investors are more likely to incur illiquidity costs when market returns are lower (as in the Huang article) or if illiquidity costs themselves go up when systematic returns are low. *See* Viral V. Acharya & Lasse Heje Pedersen, *Asset Pricing with Liquidity Risk*, 77 J. FIN. ECON. 375 (2005). Thus, the asset's residual return is correlated with aggregate risk even if its absolute return is not. This correlation between residual returns

To illustrate the two different types of illiquidity premiums, suppose that there is a fixed supply of two types of assets and that there are no income taxes. Assume further that the discount rate is zero and that all investors have identical preferences.[20] Investors want to maximize returns but are subject to liquidity shocks such as job losses or health problems. In the event of a liquidity shock, investors need consumption immediately and must sell their assets for whatever amount they can or take some other costly action—such as borrowing at a high rate—to acquire consumption. Doing nothing in the event of a liquidity shock is not an option.[21]

Assume that there is a perfectly liquid asset (Asset *L*) that is also riskless, yielding one dollar at any time. Because this example focuses on relative prices, assume that Asset *L* sells for a price of one dollar today. Asset *L* resembles cash or a checking account. Consumption can be accessed with Asset *L* at any time, but the asset earns no interest. Asset *L*'s absolute return is zero, and the illiquidity costs of Asset *L* are zero, making Asset *L*'s residual return zero as well.

Assume further that there is also an illiquid asset (Asset *IL*). Asset *IL*'s absolute return is riskless; after one year has passed the asset returns $\$R$ in all circumstances. If investors hold on to Asset *IL* through the entire year, they bear no illiquidity costs and have a residual return of $\$R$. If investors try to sell Asset *IL* suddenly or use a backup liquidity option, they incur illiquidity costs of $\$c$. If investors experience a liquidity shock, their residual return is therefore $\$(R\text{-}c)$. Asset *IL* resembles any asset that is costly to sell rapidly because there are few buyers or sellers (examples include real estate, an ongoing business, or a specialized machine). Because this example focuses on relative prices, assume that Asset *IL* also sells for a price of one dollar today.[22] (The relative price of Assets *L* and *IL* will be determined by the return *R* yielded by Asset *IL*.)

The absolute return $\$R$ yielded by Asset *IL* must be high enough to make investors indifferent between holding Asset *IL* and Asset *L*. If Asset *L* returns one dollar, then Asset *IL* must have an absolute return of more than one dollar to compensate investors for the higher expected illiquidity costs of *IL*. Because $\$R > \$1$, there is an illiquidity premium in absolute returns.

and market risk is more salient with illiquid assets, which have illiquidity costs that are a more salient component of the residual return.

20. This assumption is made for simplicity. The example can easily be altered to allow for a positive discount rate.

21. In this example, assume that future consumption has no value in the event of an immediate liquidity shock.

22. The price of Asset *IL* will be in terms relative to Asset *L*'s arbitrarily set price of one dollar. The nominal values are not meant to have any meaning.

1. *Illiquidity Premium in Absolute Returns but Not in Residual Returns*

The size of the illiquidity premium for Asset *IL* depends upon the model underlying investors' need for liquidity, the probability that investors need liquidity, and the illiquidity costs associated with Asset *IL*. Suppose that the probability of needing liquidity is 50% and that illiquidity costs (c) are equal to $0.20. If investors are risk-neutral, then the illiquidity premium in absolute returns is $1.1 (a 10% return).[23] The expected liquidity costs from holding Asset *IL* is the probability of a liquidity shock (0.5) multiplied by the illiquidity costs should there be a shock ($0.20) for a total of $0.1. Thus, the residual return from Asset *IL* is 1—the absolute return (1.1) minus the illiquidity costs (0.1). The residual return rate of *IL* is 0%. This is the same residual return rate as Asset *L*.

As described above, risk-neutral investors demand an illiquidity premium in absolute returns to compensate them for expected transaction costs. Risk-neutral investors do not demand a residual return illiquidity premium.

2. *Illiquidity Premium in Absolute and Residual Returns*

Now assume that investors are risk-averse and must incur illiquidity costs in situations where their earnings are already low. Assume that when investors experience a liquidity shock they have labor income of $0.6 and that if they do not experience a liquidity shock then they have labor income of $1.4, so that investors have to liquidate illiquid investments only when times are bad. With the probability of liquidity shocks and illiquidity costs as in the previous example and common risk-averse preferences, the absolute return of Asset *IL* required to make investors indifferent between Assets *L* and *IL* is 12.2%.[24] This

23. Expected utility is given by $EU=pu(x_1)+(1-p)u(x_2)$, where p is the probability of a liquidity shock, x_1 is consumption in the event of a liquidity shock, and x_2 is consumption when there is no liquidity shock. If investors are risk-neutral, then utility is given by $u(x)=x$. Asset *L* therefore has expected utility of 1. To make a risk-neutral investor subject to liquidity shocks indifferent to Asset *L*, Asset *IL* must give the same expected utility. Plugging in for a 50% chance of a liquidity shock implies $\$1=0.5(\$R-\$0.2)+0.5\$R$. Thus, $R=\$1.1$, implying a 10% absolute return over Asset *IL*'s purchase price of $1.

24. As before, $EU=pu(x_1)+(1-p)u(x_2)$. As in the previous example, $p=0.5$ and $c=\$0.2$. In this example, the utility function is given by $u(x)=\ln(x)$, $x_1=0.6+R-c$, and $x_2=1.4+R$. With liquid Asset *L* again yielding no return and having no illiquidity costs c, then $EU(L)=pu(x_1)+(1-p)u(x_2)=0.5\ln(0.6+1)+0.5\ln(1.4+1)=0.672$. To make investors indifferent between Asset *L* and Asset *IL* therefore requires *IL* to bring the same expected utility, so $EU(IL)=EU(L)=pu(x_1)+(1-p)u(x_2)=0.5\ln(0.6+R-0.2)+0.5\ln(1.4+R)=0.672$, which implies that $R=1.122$.

absolute return means that the expected residual return of Asset *IL* is approximately 2% (because expected illiquidity costs are approximately 10%), which is greater than Asset *L*'s residual return of 0%. When illiquidity costs are likely to be experienced in difficult periods and investors are not risk-neutral, then the absolute return of Asset *IL* must be high enough not merely to compensate for expected illiquidity costs but also to compensate for the fact that illiquid assets systematically yield less residual return when incremental consumption is most valuable. Thus, Asset *IL* must yield an illiquidity premium in both absolute returns *and* residual returns (net of transaction costs).

B. Supply and Demand in the Market for Liquidity

The previous Section described the illiquidity premium necessary for identical investors to choose an illiquid asset rather than a liquid asset. This Section complicates that analysis by assuming that investors differ in their desire for liquidity. For risk-neutral investors (as in Subsection I.A.1), some investors may have high illiquidity costs while others have lower illiquidity costs (variation in c). Alternatively, different investors may have different probabilities of needing liquidity (variation in π). Investors with low illiquidity costs or low probabilities of needing liquidity require a lower absolute return illiquidity premium from Asset *IL* than investors with high illiquidity costs or a high probability of needing liquidity. If investors are not risk-neutral (as in Subsection I.A.2), then the absolute return premium required to make investors indifferent between liquid and illiquid assets is a function of expected illiquidity costs, the probability of a liquidity shock, and the relationship (covariance) among these costs and probabilities and the market return.

This heterogeneity among investors creates a demand curve for liquidity (see Figure 1). Few investors have such high c or π that they would be willing to forgo a 20% absolute return premium from Asset *IL* for the liquidity of Asset *L*. Many more investors, by contrast, would be willing to forgo a 5% absolute return premium from Asset *IL* in exchange for Asset *L*. Thus, the demand curve for liquidity is downward sloping. As the price of liquidity in terms of forgone absolute return premium goes down, the amount of Asset *L* demanded rises.

The financial world contains many examples of downward-sloping liquidity demand curves. The theory of demand for money, for example, is based on the notion that at low prices individuals demand a large amount of

liquid money while at high prices investors demand lower liquid money levels.[25]

There is also a supply curve for liquidity. The liquidity of assets available for purchase is not exogenously determined. Instead, liquidity can be produced at some cost. Without the existence of financial intermediation, most assets would be hard to sell. With the help of financial services, almost any illiquid asset can be transformed into a liquid asset. Some illiquid assets are easier to transform into liquid assets than others, however. For example, an asset or commodity that is widely used is relatively easy to turn into a liquid asset. The commodity just needs the creation of a market for that asset. Because the commodity is widely used, a market for the commodity or asset will draw many people. A highly specialized asset, by contrast, is much harder to transform from an illiquid asset into a liquid asset. For example, it should be relatively cheap to find a buyer for a commodity like wheat but expensive to find a buyer for a specialized machine.

There are many examples of liquidity being produced at some cost. Banks, for example, provide liquidity for individuals while enabling long-term investments, though at the cost of creating an institution that is inherently unstable and subject to "runs."[26] Similarly, borrowers with a demand for capital can seek it in the markets by offering various liquidity options. Short-term borrowing offers lenders more liquidity than long-term loans. From the borrower's perspective, however, short-term loans are more expensive than long-term loans. Short-term loans require the borrower to maintain adequate liquidity to repay the short-term loans should the loans not be rolled over. As a result, short-term borrowings cannot be used to fund the same types of investments as long-term borrowings, making short-term borrowings more expensive. This explains why not all borrowers issue short-term debt, despite the fact that short-term debt is associated with a lower interest rate.

The supply curve for liquidity is upward sloping (see Figure 1). A small amount of Asset *L* can be produced from Asset *IL* at very low cost and therefore with only a small sacrifice in absolute illiquidity premiums. Obtaining greater quantities of liquidity, however, requires the transformation of assets that are harder to transform. The transformation from illiquid *IL* to liquid *L* in these cases is worthwhile only if a considerable amount of absolute return can be saved.

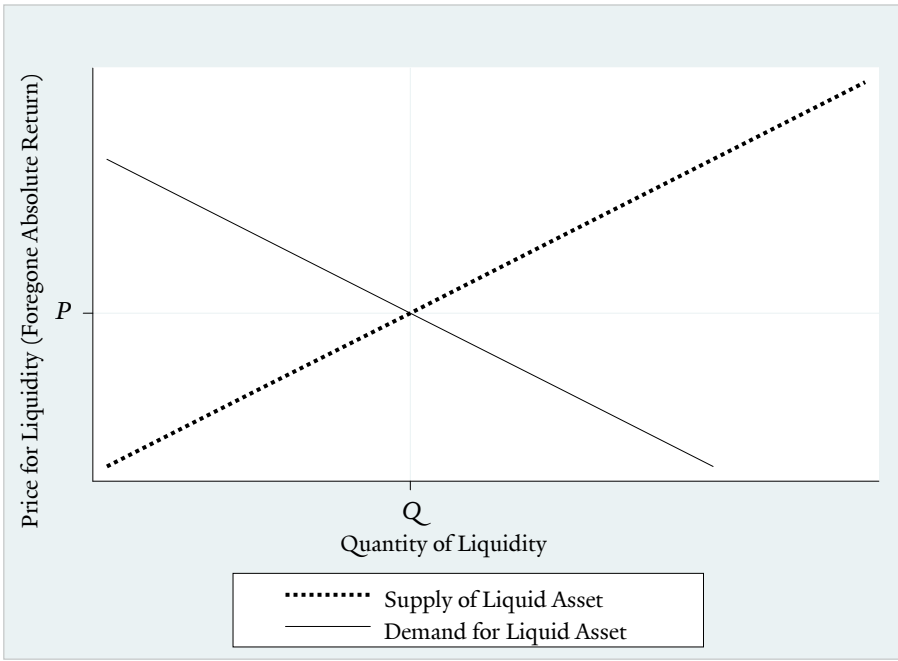
25. *See, e.g.*, Baumol, *supra* note 14, at 547 (demonstrating that cash holdings rise when the interest rate – the price of money – goes down).

26. *See, e.g.*, Douglas W. Diamond & Philip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 J. POL. ECON. 401 (1983) (showing that banks are subject to multiple equilibria, one of which is an inefficient run on a bank). For further discussion, see Subsection III.A.4.

Equilibrium in the market for liquidity occurs where the supply and demand curves for liquidity intersect (see Figure 1). At this price and quantity of liquidity, the value of additional liquidity to the marginal investor in terms of reducing expected illiquidity costs equals the cost of producing this liquidity.

The examples offered above in Section I.A provide further information about the equilibrium point in Figure 1. If investors are risk-neutral (as described in Subsection I.A.1), then the marginal investor will receive an absolute return illiquidity premium that equals the marginal investor's expected illiquidity costs. As a result, the marginal investor receives an illiquidity premium in absolute but not residual returns. If, however, liquidity shocks or costs are correlated with market risk and investors are not risk-neutral (as described in Subsection I.A.2), then the market price of liquidity in absolute terms should be higher. In this case, the marginal investor receives an illiquidity premium in both absolute and residual returns for holding the illiquid asset.

Figure 1.
LIQUIDITY EQUILIBRIUM



C. *Empirical Evidence for the Relationship Between Illiquidity and Return*

While the theoretical arguments for a tradeoff between liquidity and return are compelling, the empirical evidence for the tradeoff is even stronger.

1. *Cross-Sectional Evidence*

Cross-sectional studies compare returns for stocks with different liquidities; they control for other determinants of return, such as risk.[27] Most of these studies demonstrate that illiquid stocks or bonds have higher returns than more liquid stocks.[28] One well-known study, for example, estimates that a stock with a 3% bid/ask spread (a relatively illiquid stock) will return almost 5% more annually than a stock with a 0.5% bid/ask spread (a liquid stock).[29]

2. *The Value of Liquidity in Nearly Identical Assets*

While the cross-sectional evidence is suggestive, the most compelling empirical evidence for the importance of liquidity in determining return follows a simpler research design that compares assets that are similar in all respects aside from liquidity. Take two assets that are nearly identical in terms of their expected cash flows but have different liquidity profiles, with one of the assets being easy to sell cheaply (liquid) and the other asset more difficult to sell (illiquid). If the second asset consistently earns a higher return than the first asset, then the difference in return can be attributed to the difference in liquidity rather than other factors. Such scenarios constitute a well-controlled experiment of the value of liquidity.

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27. There is no one universally agreed-upon empirical measure of illiquidity. One popular proxy for liquidity is the bid/ask spread of a stock. The bid/ask spread is defined as the "difference between the price at which a Market Maker is willing to buy a security (bid), and the price at which the firm is willing to sell it (ask)." *Glossary*, FIN. INDUS. REGULATORY AUTH., http://www.finra.org/Glossary/P010868 (last visited Nov. 7, 2010). When the bid/ask spread is high, the seller pays a high transaction cost for selling. For example, in many real estate markets the bid/ask spread—the difference between what the buyer pays and the seller receives—can be considerably higher than 6% of the value of a home. *See What Does Selling or Buying a House Really Cost?*, SMART MORTGAGE CONSULTANTS, http://www.smartmortgageconsultants.com/what-does-selling-or-buying-a-house-really-cost (last visited Nov. 7, 2010).

28. *See Liquidity and Asset Prices*, *supra* note 1, at 305-17.

29. *See id.* at 308 fig.3.1 (citing Yakov Amihud & Haim Mendelson, *Liquidity and Stock Returns*, 42 FIN. ANALYSTS J. 43 (1986)).

a. Restricted Stock

In U.S. markets, publicly traded companies may issue restricted stock alongside publicly traded stock. The restricted stock has the same legal rights to the companies' assets as the ordinary stock but cannot be sold in the public markets for an extended period. Restricted stock is therefore much more costly to sell and is, consequently, more illiquid.[30] Studies comparing returns for restricted versus unrestricted stock estimate that if the unrestricted stock gets an average return of 10%, then the restricted stock typically yields around 19%.[31] The illiquidity of the restricted stock causes the return to double, in spite of the fact that the cash flow and voting rights of the two shares are identical.

b. Treasury Bills Versus Treasury Notes

A third example of seemingly identical cash flows yielding different returns due to differential liquidities comes from the U.S. Treasury Bond Market. Compare a six-month treasury bill with a ten-year treasury note that is six months from expiring. At the present moment, both instruments involve a promise from the U.S. government to pay a sum in six months time. The term and the payor are identical. The six-month bill and the ten-year note with six months remaining trade in different markets, however. The six-month bill market is far more liquid than the ten-year note market. As a result, it is cheaper to sell the six-month bill in the event of a need for cash than it is to sell the ten-year note with six months remaining. In fact, the more liquid six-month bill yields almost 0.5% less annually than the ten-year note with six months remaining, in spite of their seemingly identical profiles. This difference in return for low-yielding and almost risk-free securities provides yet another example of the importance of liquidity for asset returns.[32]

The cross-sectional evidence and the cases of restricted stock and the U.S. Treasury bill market provide compelling evidence that the tradeoff between return and liquidity is not simply a theoretical construct but is also empirically and practically important. While transaction costs are difficult to estimate, the consensus is that the illiquidity premium derived from assets exceeds the

30. While restricted stock is impossible to sell in public markets, it can be sold to certain qualified purchasers in privately brokered transactions. The cost of such a sale, however, is much greater than the cost of selling the equivalent unrestricted stock in a private market.

31. *Liquidity and Asset Prices*, *supra* note 1, at 329-31.

32. *See* Yakov Amihud & Haim Mendelson, *Liquidity, Maturity, and the Yields on U.S. Treasury Securities*, 46 J. FIN. 1411 (1991).

expected transaction costs from illiquidity, implying an illiquidity premium in both absolute and residual returns.[33] Moreover, the estimated differences in yield associated with differences in liquidity are large enough for us to see a significant difference in returns.

D. The Importance of Liquidity in the Economy

The previous Sections explained why liquidity is valuable but provided only a tangential sense of the magnitude of liquidity's value. The market for liquidity is, perhaps not surprisingly, an enormous one.

Cash and checking accounts are financial assets with almost no "income" in the conventional sense. Rather, the return from holding these assets consists of imputed income and consumption of transaction services. Both of these asset classes are enormous. The total value of U.S. cash and checking accounts—financial assets whose only return is liquidity—totaled $1.8 trillion in October 2010.[34] Other assets, such as savings accounts and money-market accounts, provide considerable liquidity as well as a low (but nonzero) return. The aggregate value of a broader definition of liquid financial assets in the United States, M2, which includes savings and money-market accounts as well as cash and checking accounts, totaled over $8.7 trillion.[35] Other assets, such as publicly traded securities, offer less liquidity than cash or savings accounts but are still relatively easy to sell compared to truly illiquid assets such as closely held corporations or real property. The aggregate value of publicly traded U.S. equity assets in November 2010 was almost $13 trillion.[36]

Thus, liquidity is an important component of the return of a vast array of financial assets. In addition, the market for liquidity plays a very important role in theory. The entire Keynesian theory of output fluctuations depends upon the existence of a market for liquidity.[37] As a result, any income-tax-related distortion in the market for liquidity is extremely important for both empirical

33. *See* Huang, *supra* note 19.

34. For a full listing of M1 values through October 2010, see FED. RESERVE BD., FEDERAL RESERVE STATISTICAL RELEASE: MONEY STOCK MEASURES tbl.1, *available at* http://www.federalreserve.gov/releases/h6/current/h6.pdf.

35. *Id.*

36. *See Wilshire 5000 Total Market Index*, WILSHIRE ASSOCS., http://www.wilshire.com/Indexes/Broad/Wilshire5000 (last visited Nov. 7, 2010). If only one percent of such assets' total return is in the form of liquidity (again, probably an underestimate), then that yields another $130 billion in imputed income due to liquidity.

37. The liquidity preference and money supply curve of the Keynesian IS-LM model is derived in part from the existence of a liquidity supply-and-demand equilibrium.

and theoretical reasons. The next Part examines the possibility of such distortions.

II. THE PRICE AND QUANTITY OF LIQUIDITY IN THE PRESENCE OF INCOME TAXES

The previous Part established that liquidity is a valuable feature of an asset for investors. Under any assumption, the absolute return of an investment (its reported return) increases as an asset's liquidity decreases. Investors must be compensated for the additional expected costs associated with holding an illiquid asset. This Part examines the consequences of a "mark-to-market" income tax on individual investors for the tradeoff between liquidity and yield.[38] The implications of income taxes for the illiquidity premium depend upon the source of the illiquidity premium. This Part first examines how an income tax alters the liquidity/return tradeoff when investors are risk-neutral and there is an illiquidity premium absent income taxes in absolute, but not residual, returns. It then examines the role of an income tax when illiquidity risk must be compensated for by a premium in both absolute and residual returns. In both contexts, the focus is on individual investors rather than on businesses.

A. The Impact of Income Taxes on the Illiquidity Premium when Investors Are Risk-Neutral

As discussed in Section I.A, risk-neutral investors demand compensation for holding illiquid assets. The residual return from illiquid assets must equal the residual return from holding liquid assets. Illiquid assets must offer an absolute return premium equal to the expected illiquidity costs associated with holding an illiquid asset.[39]

Does the introduction of an income tax change this simple tradeoff between liquidity and return? The answer depends upon the income tax treatment of the benefits and costs of illiquid versus liquid assets. Illiquid assets have high absolute returns, which are subject to an income tax. They also introduce the inevitability of illiquidity costs. Liquid assets offer a lower absolute return and therefore a lower income tax burden on absolute returns. They also obviate the need for investors to incur substantial costs in converting their assets into

38. The mark-to-market assumption will be relaxed below. By assuming a mark-to-market income tax, the return from illiquid assets gets taxed immediately.

39. *See supra* Subsection I.A.1.

consumption. If the illiquidity costs associated with holding illiquid assets are fully deductible from income, then an income tax does not alter the liquidity/return tradeoff. Even if illiquidity costs are not fully deductible, an income tax does not alter the liquidity/return tradeoff if the "imputed" benefits of liquid assets in reducing the costs of acquiring consumption are taxable.[40] If, however, illiquidity costs are imperfectly deductible but imputed liquidity benefits go untaxed, then the introduction of an income tax distorts the liquidity/return tradeoff, increasing the illiquidity premium and creating a pretax residual return illiquidity premium.

This point is worth emphasizing. The introduction of an income tax does not per se change the relative desirability of liquid versus illiquid assets. Instead, it is the tax treatment of the costs and benefits of liquid versus illiquid assets that causes distortions to the market for liquidity.

Like many kinds of imputed income, the costs of acquiring consumption alleviated by liquidity go untaxed. Investors holding cash or some other liquid asset do not pay income tax on the benefit that they receive from that asset when they are able to buy consumption at a retail establishment that accepts only certain forms of payment. Therefore, an income tax distorts the illiquidity premium unless illiquidity costs are fully deductible.

While illiquidity costs would be fully deductible in a truly comprehensive income tax, the current income tax on individual investors allows deductions for some illiquidity costs but not for others. Some deductible illiquidity costs include capital losses associated with having to sell an illiquid asset quickly for a "fire sale" price and investment-related transaction costs such as trading commissions (which reduce taxable sales proceeds).[41] These costs, however, are incompletely deductible. Section 1211 of the Internal Revenue Code, for example, limits the ability to take deductions from capital losses to the amount

40. Imputed income refers to the "in-kind" benefits received from property and/or labor. Liquidity is an in-kind benefit associated with property. *See* MICHAEL GRAETZ & DEBORAH SCHENK, FEDERAL INCOME TAXATION: PRINCIPLES AND POLICIES 121-23 (rev. 4th ed. 2001). While tax scholars have listed many forms of imputed income from property, most prominently the imputed rental value of assets such as homes and cars (consumer durables), they have not examined the liquidity benefits of financial assets. *See, e.g.*, David S. Davenport, *Education and Human Capital: Pursuing an Ideal Income Tax and a Sensible Tax Policy*, 42 CASE W. RES. L. REV. 793, 837-38 (1992) (describing many examples of imputed income but never mentioning liquidity).

41. *See* I.R.C. § 163(d)(3)(C) (2006); 34 AM. JUR. 2D *Federal Taxation* § 18379 (2010). For a helpful discussion of deductible and nondeductible investment related costs, see Rande Spiegelman, *Investment Expenses: What's Tax Deductible?*, CHARLES SCHWAB (Sept. 16, 2004), http://www.schwab.com/public/schwab/research_strategies/market_insight/financial_goals/tax/investment_expenses_whats_tax_deductible.html.

of capital gains enjoyed by a taxpayer plus $3000.[42] Section 1212 allows capital losses in excess of this amount to be "carried forward" to be used as offsets to gains in future years.[43] If the losses are carried forward, then the discounted value of the tax benefits from these losses is reduced. If there are no applicable gains, then losses may go unused. Similarly, many deductions for investment-related costs are allowed only beyond a floor of 2% of adjusted gross income because they are "miscellaneous" itemized deductions.[44]

Many other costs associated with illiquidity cannot be deducted at all. For example, if investors choose to take on credit card debt for consumption rather than liquidate an illiquid asset—a common usage of credit cards[45]—the costs of this debt are entirely nondeductible as personal interest.[46] Overdraft fees from banks on personal accounts are also nondeductible.[47] "Shoe leather costs"—the opportunity cost of the time and energy devoted to transforming illiquid assets into liquid assets—are entirely nondeductible.[48] Investors who hold little cash, for example, have to make frequent trips to banks and ATMs, but they do not get to deduct the costs of these excursions. Similarly, investors with no liquid assets will occasionally be unable to consume a desired good because they do not have the liquidity to pay for it (for example, they have no cash at a retail establishment that accepts only cash), and these frustration costs cannot be deducted.

The nondeductibility of many of the costs of illiquidity, combined with the nontaxation of the benefits of liquidity relating to transactions services, distorts

42. I.R.C. § 1211(b).

43. *Id.* § 1212.

44. *Id.* § 67. All investment related costs not specifically mentioned in § 67(b) can only be deducted by the amount by which they exceed 2% of adjusted gross income. *See* Spiegelman, *supra* note 41.

45. *See* Dagobert L. Brito & Peter R. Hartley, *Consumer Rationality and Credit Cards*, 103 J. POL. ECON. 400 (1995) (describing how using credit cards with high interest rates can be a rational response to liquidity shocks).

46. I.R.C. § 163(h). Note that § 163(d) of the Internal Revenue Code allows deductions for interest for money that is borrowed in order to purchase an investment. Credit card debt does not fall into this category, and neither do many other easily accessible sources of credit during a liquidity shock, such as ordinary lines of credit (with the exception of a home-equity line of credit).

47. *See* Rev. Rul. 82-59, 1982-1 C.B. 47. In some cases, even overdraft fees on business accounts are nondeductible. *See* Bailey v. Comm'r, 60 T.C.M. (RIA) 1925 (1991). Note that overdraft fees totaled over $38 billion in 2009. *See* Saskia Scholtes & Francesco Guerrera, *US Banks Set for $38.5bn Windfall in Overdraft Fees*, FIN. TIMES (ASIA), Aug. 10, 2009, at 3.

48. For a discussion of shoe leather costs in the context of inflation, see N. GREGORY MANKIW, MACROECONOMICS 97 (5th ed. 2003).

the tradeoff between liquidity and return. All else being equal, investors will trade more return for a given amount of liquidity once an income tax is introduced. With an income tax, an absolute illiquidity premium equal to expected illiquidity costs no longer provides enough incentive for investors to hold illiquid assets. Instead, the absolute return of an illiquid asset must be high enough to compensate investors for expected illiquidity costs plus the additional expected value of income taxes associated with holding illiquid versus liquid assets. Because the higher absolute returns associated with illiquid investments no longer equal expected illiquidity costs, income taxes create an illiquidity premium in pretax residual returns.

1. The Illiquidity Premium Changes when Income Taxes Are Introduced

Returning to the example in Subsection I.A.1, suppose that 40% of liquidity costs (c) can be deducted while 60% of the costs cannot be deducted and that the income tax rate is 50%. Assume, as before, that the probability of a liquidity shock is 50% and the pretax illiquidity costs if there is a liquidity shock are $0.20. Under these circumstances, Asset *IL* must have an absolute return of 16%.[49] Because expected illiquidity costs remain at 10%, an absolute return of 16% for Asset *IL* implies a pretax residual return of 6%. The introduction of an income tax that taxes yield but does not allow deductions for all costs associated with illiquidity implies that there is an illiquidity premium in both absolute and residual returns, even if investors are risk-neutral. The illiquidity premium in absolute and residual returns is necessary to compensate investors for the unfavorable income tax characteristics (full taxation of returns, only partial deduction of losses) of illiquid assets.

If, counterfactually, all illiquidity costs are fully deductible from tax, then the absolute and residual illiquidity premiums remain unchanged from the pretax analysis. The absolute return illiquidity premium remains equal to the expected illiquidity costs of holding the asset and the illiquidity premium in residual returns remains at zero.

49. With an income tax, the expected return of Asset *L* remains one (because there are no illiquidity costs and no positive returns). The post-income-tax expected return of Asset *IL* to give the same expected utility becomes $EU(IL)=p[(R-c)-(R-0.4c-1)t]+(1-p)[R-(R-1)t]u(x_2)=0.5[(R-0.2)-(R-0.4\times0.2-1)0.5]+0.5[R-(R-1)0.5]=1$, which implies that $R=1.16$.

2. *Income Taxation and the Price and Quantity of Liquidity*

As just demonstrated, the nondeductibility from income of many illiquidity costs, combined with the nontaxation of the benefits of liquidity, distorts the market for liquidity. Whereas before the introduction of an income tax, the investors of our example required a 10% illiquidity premium in absolute returns, investors now require a 16% illiquidity premium to hold Asset *IL*. This means that the demand curve for liquidity shifts up. Like the investors in the previous example, all investors demand a higher illiquidity premium in absolute returns to compensate them for the higher expected income tax burden associated with illiquid rather than liquid assets.

Figure 2.
LIQUIDITY EQUILIBRIUM WITH INCOME TAXES

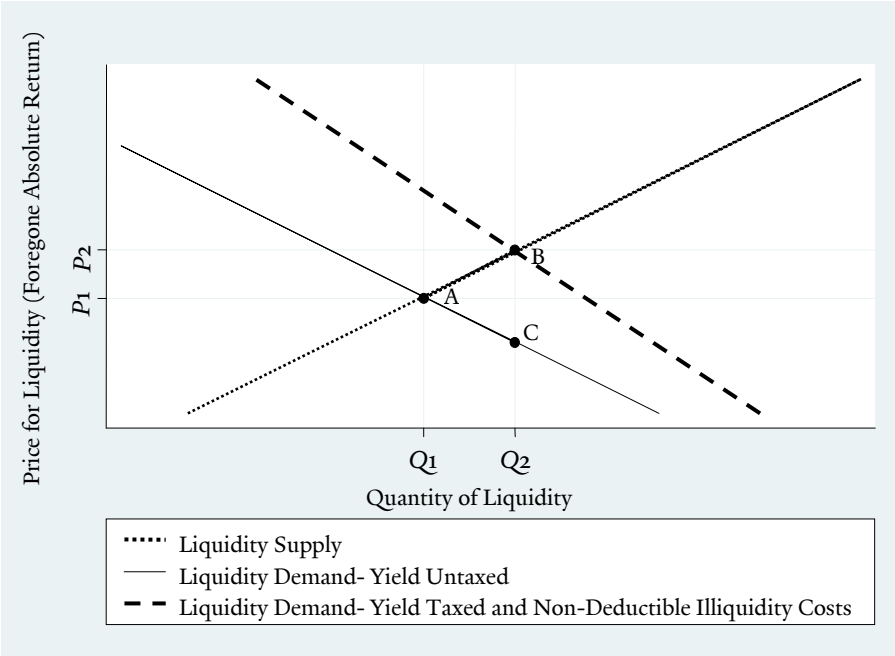

Figure 2 presents the tax-induced shift in the liquidity demand curve. All investors demand a higher absolute return premium to compensate for the higher expected income tax burden associated with holding illiquid assets that

yield a taxable return but require partially nondeductible liquidity costs.[50] This shift in demand for liquidity causes the price of liquidity to rise from P_1 to P_2 and the quantity of liquidity supplied to rise from Q_1 to Q_2. The income tax makes liquidity more attractive relative to illiquidity, causing the price and quantity of liquidity supplied to increase. With an income tax, more investors will prefer Asset *L* to Asset *IL*. At Q_2, the marginal investor receives an absolute-return illiquidity premium that exceeds expected illiquidity costs, implying that the marginal investor receives an illiquidity premium in both absolute and residual returns.

The combination of the stylized income tax examined here and the nondeductibility of illiquidity costs leads to the overproduction of liquidity. For investors in the range between Q_1 and Q_2, the costs of liquidity production (given by the liquidity supply curve) exceed the expected illiquidity costs (given by the untaxed liquidity demand curve). Nevertheless, these investors hold liquid rather than illiquid assets in the presence of an income tax because the expected tax burden associated with the liquid asset is lower than the tax burden of the illiquid asset. The introduction of income taxation therefore causes deadweight loss for each increment of liquidity created where the benefits of the liquidity fall short of the costs. The total deadweight loss is represented by the area of the triangle *ABC*. The deadweight loss caused by the introduction of an income tax rises when expected illiquidity costs are higher and illiquidity costs are less likely to be deductible from income tax.

B. The Impact of Income Taxes on the Illiquidity Premium when Investors Are Risk-Averse and Illiquidity Costs Are Correlated with Aggregate Risk

Subsection I.A.2 demonstrated that investors receive illiquidity premiums in both absolute and residual returns in the absence of income taxes when illiquidity risk is correlated with aggregate return. Even if the underlying absolute returns of an asset are not correlated with aggregate risk, illiquid assets need to pay a residual illiquidity premium to compensate investors for the fact that residual returns—which investors care most about—are correlated with aggregate risk because illiquidity costs are correlated with aggregate risk.

50. Note that the shift in demand is not a proportional upward shift of the liquidity demand curve. Investors with high expected illiquidity costs will have greater amounts of nondeductible illiquidity costs. These investors' demand for liquidity will shift up by a greater degree than investors who have low expected illiquidity costs. If there is a category of investors with no illiquidity costs, then these investors' demand for liquidity will be unaffected by the introduction of an income tax. If illiquidity imposes no costs, then the nondeductibility of illiquidity costs imposes no burden.

Illiquidity premiums in residual returns are therefore similar to the oft-studied risk premium, which specifies that assets whose absolute return is correlated with aggregate risk must pay an expected return premium, even if there are no illiquidity costs.

This Section examines the effect of the introduction of an income tax on the price and quantity of illiquid assets in the economy. The analysis proceeds in three parts. First, it considers the effect of an income tax when portfolios can be adjusted at no cost, tax payments and refunds are made instantaneously, and illiquidity costs are perfectly deductible. In this context, a taxation of illiquidity premium in absolute returns will have no impact on the price or aggregate quantity of liquidity. It then considers the impact of partial deductibility of illiquidity costs and finds that partial deductibility lowers the quantity of illiquid assets and causes deadweight loss. Finally, this Section considers how the assumption of costless portfolio adjustment and instant receipt of tax payments and refunds affects the analysis. These assumptions are unlikely to be satisfied in the context of illiquidity and this discussion concludes that, as in the previous Section with risk-neutral investors, it is likely that the income tax as structured in this Part increases the quantity of liquidity in the economy and raises the illiquidity premium in absolute returns.

1. *Illiquidity Supply and Demand with Fully Deductible Illiquidity Costs and Fully Adjustable Investment Portfolios—Domar-Musgrave for Illiquidity*

The Domar-Musgrave result demonstrates that, under certain assumptions, an income tax taxes only risk-free returns in spite of the existence of a risk premium.[51] Income taxation of a risk premium is undone by investor behavior. When an income tax is introduced, investors increase ("gross up") their investments in the risky asset to counteract perfectly the effect of the tax. Excluding the tax on the riskless element of returns, the government's tax claim is equivalent to a risky asset with positive expected value but zero net value, as the positive expected value is just enough to compensate for the risk associated with the tax claim.[52] In general equilibrium models, the government offsets the risky portfolio associated with its tax claims by selling risky assets

51. *See* Domar & Musgrave, *supra* note 3.

52. *See generally, e.g.*, Louis Kaplow, *Taxation and Risk-Taking: A General Equilibrium Perspective*, 47 NAT'L TAX J. 789 (1994) (demonstrating the Domar-Musgrave result in a straightforward general equilibrium framework); Weisbach, *supra* note 3 (providing a general overview of the Domar-Musgrave result).

and purchasing risk-free assets.[53] The increased quantity of risky claims held by the private sector in response to income taxes is offset by a negative position in risky claims held by the government. The total amount of risky assets in the economy remains unchanged when a tax on risky assets is introduced.[54]

When illiquidity costs are fully deductible and investors can alter their portfolios freely, the introduction of an income tax has the same effect on the illiquidity premium that it has on risk premiums. The income tax has no effect at all. That is, the size of the illiquidity premium in absolute and residual returns and the total amount of liquid and illiquid assets in the economy remain constant. This result operates in the same manner as the Domar-Musgrave result.

The derivation of this result follows directly from the general equilibrium proof of the Domar-Musgrave result.[55] In effect, illiquidity risk constitutes a second systematic risk factor alongside risk in absolute returns.[56] If illiquidity costs covary with systematic risk, then investors demand a premium for this covariance, just as investors demand a premium for assets whose absolute return covaries with systematic risk. The introduction of an income tax provides liquidity insurance for investors who hold illiquid assets. With this insurance, investors will increase their demand for illiquid assets at any given premium. Private holdings of illiquid assets therefore increase. The government's tax claim on the illiquidity premium amounts to holding a portfolio of illiquid assets with positive expected return, and the government will offset this holding by selling (going short on) illiquid assets. The government's short-selling of illiquidity offsets investors' increased holdings of illiquid assets. As a result, the total amount of illiquid assets in the economy (the combined holdings of investors and the government) remains unchanged, as does the illiquidity premium.

To see this result in the context of the examples used in this Article, consider the change to the illiquidity premium when investors are risk-averse,

53. *See* David A. Weisbach, *Taxation and Risk-Taking with Multiple Tax Rates*, 57 NAT'L TAX J. 229, 231-33 (2004) (summarizing Kaplow's general equilibrium Domar-Musgrave model by noting that the government makes portfolio adjustments).

54. *Id.* at 232-33.

55. Kaplow, *supra* note 52, at 790-92, provides an easy-to-follow version of the proof.

56. The Acharya & Pedersen model of the illiquidity premium, *see supra* note 19, explicitly models illiquidity risk as a second systematic risk factor in addition to the typical CAPM systematic risk factor. As Weisbach notes, "If there are multiple systematic risk factors, the [Domar-Musgrave] model would need to be expanded to consider more than two assets. The extension . . . however, is trivial. The individual makes a similar portfolio adjustment for each asset, leaving only a tax on the risk-free rate of return." Weisbach, *supra* note 53, at 233 n.6.

illiquidity costs are correlated with other consumption risk, and the costs of illiquidity are fully deductible. Suppose that the income tax rate is 50%. Assume that the probability of liquidity shock is 50% and the pretax illiquidity costs if there is a liquidity shock are $0.20. In this case, investors require an 11.8% absolute return from Asset *IL* to make them indifferent between *IL* and Asset *L*.[57] This is lower than the 12% absolute return required from Asset *IL* in the absence of taxes. Although investors owe more income taxes on average, the liquidity insurance function of the income tax is more valuable to investors than the cost of this insurance in terms of expected income taxes. As a result, the absolute return illiquidity premium demanded by investors for Asset *IL* goes down.

The illiquidity premium in this example goes down because the income tax serves as liquidity insurance for investors. When investors face a liquidity shock, tax refunds from the government (from the deduction of illiquidity costs) cushion the pain of the liquidity shock. While the income tax reduces the post-tax return of the illiquid asset when there is not a liquidity shock (and therefore investors pay a positive expected income tax), the value of the insurance is sufficient to make illiquidity more attractive when the income tax is introduced. The income tax with full deductibility of costs, however, means that the government now holds a portfolio of illiquid assets with positive expected return. According to the general equilibrium Domar-Musgrave result, the government seeks out liquid assets to offset the long position in illiquid assets that it holds from the tax. This demand for liquid assets from the government offsets the decrease in liquid-asset holdings from the private sector. The quantity of liquidity in the economy is therefore the same as it would be in an economy without an income tax.[58]

2. *Illiquidity Holdings with Partially Deductible Illiquidity Costs*

The introduction of an income tax does not distort the market for liquidity when illiquidity costs are fully deductible. Illiquidity costs are not fully

57. With an income tax, the expected return of Asset *L* remains one (because there are no illiquidity costs and no positive returns). The expected utility associated with Asset *L* is 0.672. *See supra* note 24. To make investors indifferent between Asset *IL* and Asset *L* requires $EU(IL)=p[u((R-c)-(R-c-1)t+x_1)]+(1-p)[u(R-(R-1)t+x_2)]=0.5[\ln((R-0.2)-(R-0.2-1)0.5+0.6)]+0.5[\ln(R-(R-1)0.5+1.4)]=EU(L)=0.672$, implying $R=1.118$.

58. A supply-and-demand diagram is not discussed here because the Domar-Musgrave assumptions apply in a representative investor context with a constant tradeoff between liquid and illiquid assets. Neither of these assumptions is true in the supply-and-demand diagrams presented in this Article.

deductible, however. Section II.A detailed the many types of illiquidity costs that are nondeductible or partially deductible. These limitations to deductibility distort the price and quantity of liquidity supplied in the market.

Consider the change to the illiquidity premium when investors are risk-averse and illiquidity costs are correlated with other consumption risks, and the costs of illiquidity are only partially deductible. Suppose that 40% of liquidity costs (c) can be deducted, that 60% of the costs cannot be deducted, and that the income tax rate is 50%. Assume, as before, that the probability of liquidity shock is 50% and that the pretax illiquidity costs if there is a liquidity shock are $0.20. Under these circumstances, Asset *IL* must have an absolute return of 19.2%.[59] While the liquidity insurance of the income tax means that the illiquidity premium does not increase by the same amount as the increase in expected tax payments associated with illiquidity, the absolute return illiquidity premium increases. If a greater proportion of illiquidity costs can be deducted, however, the absolute return illiquidity premium may decrease because the liquidity insurance effect outweighs the increase in expected tax payments associated with illiquidity.

But if full deductibility of illiquidity costs does not lead to any increase in total illiquidity in the economy, then partial deductibility cannot either. While private sector demand for high-absolute-return illiquid assets may rise due to the value of liquidity insurance through the income tax, the government's demand for liquidity will counteract this decrease in liquidity holdings in the private sector. These offsetting effects leave only the increase in expected income taxes associated with illiquid assets due to the incomplete deductibility of liquidity costs. As a result, the amount of illiquid assets in the economy will go down in response to the income tax.[60]

59. With an income tax, the expected utility of Asset *L* remains 0.672 (because there are no illiquidity costs and no positive returns). Indifference between Asset *L* and *IL* now requires the post-income tax expected utility of Asset *IL* to become $EU(IL)=p[u((R\text{-}c)\text{-}(R\text{-}0.4c\text{-}1)t+x_1)]+(1\text{-}p)[u(R\text{-}(R\text{-}1)t+x_2)]=0.5[\ln((R\text{-}0.2)\text{-}(R\text{-}0.4\times0.2\text{-}1)0.5+0.6)]+0.5[\ln(R\text{-}(R\text{-}1)0.5+1.4)]=EU(L)=0.672$, implying $R=1.192$.

60. Regarding risk, Weisbach explains that differential taxation of gains and losses—analogous to differential taxation of the costs and higher return associated with illiquidity—is equivalent to uniform tax treatment plus a subsidy or penalty. Because illiquidity maps perfectly onto the risk setting, nondeductibility of some illiquidity costs represents a penalty on illiquid assets, thus decreasing investment in such assets and leading to deadweight loss. *See* Weisbach, *supra* note 53, at 238-40.

3. *Illiquidity Holdings with Partially Deductible Illiquidity Costs, Costly Portfolio Rebalancing, and Late-Arriving Income Tax Refunds for Illiquidity Costs*

Even if illiquidity costs were entirely tax-deductible, there are reasons to think that the Domar-Musgrave framework does not map perfectly onto the illiquidity premium setting. The Domar-Musgrave framework presupposes the ability of investors to alter without cost their portfolios to undo the impact of the income tax. The very existence of an illiquidity premium, by contrast, implies that investments cannot be made and unmade without cost. Investors' original asset holdings affect their ultimate asset holdings in a world with transaction frictions but not in the Domar-Musgrave context. Likewise, the Domar-Musgrave result assumes unlimited borrowing, while the existence of an illiquidity premium hinges upon the absence of the ability to borrow.

The quality of the "liquidity insurance" offered by the income tax in the liquidity setting may also not be analogous to the risk insurance provided by an income tax in the Domar-Musgrave framework. Unlike the risk insurance function of an income tax, the value of liquidity "insurance" provided by the income tax code depends crucially on the timing within which tax losses can be converted into liquid assets. During a liquidity shock, investors need consumption immediately and cannot afford the delay of a couple of months or a year. If the need for consumption is this acute, then the liquidity insurance provided by the income tax must arrive instantaneously—exactly when consumption needs are most severe. Tax refunds, to the extent that they are available at all, are seldom available instantaneously. At best, taxpayers could reduce their estimated tax payments to reflect the losses from asset sales in response to liquidity shocks. But for most taxpayers these tax payments occur on a quarterly basis, which is a long time in the context of a liquidity shock. Moreover, estimated tax payments cannot fall below zero,[61] further capping taxpayers' ability to take advantage of reduced tax liability to provide liquidity during liquidity shocks. As a result, the liquidity insurance offered by income tax is partial at best, providing another reason why the introduction of an income tax does not cause private investors to increase their exposure to illiquidity enough to cancel out the effect of the income tax.

The partial deductibility of illiquidity costs, the nonapplicability of the Domar-Musgrave assumptions, and the delay in using tax refunds as liquidity

61. *See, e.g.*, *Amended Estimated Tax Worksheet*, ILL. DEP'T OF REVENUE (2009), *available at* http://www.revenue.state.il.us/taxforms/incmcurrentyear/individual/il-1040-es.pdf (stating, for the purpose of Illinois state income tax, that "if zero or negative, the amount due on your next [estimated tax] payment is zero").

insurance all suggest that the introduction of an income tax is likely to raise demand for liquid assets relative to illiquid assets. As a result, in the case of risk-aversion, the liquidity demand curve shifts outward in the presence of income taxes, just as it does in the case of risk-neutrality (see Figure 2).

III. INEFFICIENCIES CAUSED BY THE TAXATION OF ABSOLUTE RETURN AND THE PARTIAL NONTAXATION OF LIQUIDITY

The previous Part of this Article demonstrated that the existence of taxable illiquidity premiums, combined with the inability to deduct many of the costs of illiquidity and the incompleteness of liquidity insurance via taxation, distorts the market for liquidity. For most characterizations of an income tax, demand for liquidity shifts outward, causing an inappropriately high price and quantity of liquidity. This Part now examines some of the institutional implications of this distortion in favor of liquidity.

A. The Size of the Financial Sector

Figure 2 showed that an income tax that taxes an illiquidity premium in absolute returns but does not offer full deductibility for illiquidity costs leads to the creation of more liquidity. The financial sector creates liquidity. Thus, a tax distortion favoring liquidity leads to a larger financial sector. This Section provides several examples of this effect.

1. Overproduction of Nontaxable Banking Services Rather than Interest

Many banks offer "free checking."[62] Banks process personal checks, accept for deposit checks from other entities, and allow access to money from tellers or ATMs for no charge. Providing these liquidity services is not free to the banks. Processing transactions requires both employees and sophisticated information technology. Yet banks commonly provide free checking in spite of these costs. Why? While there is no single solution to the puzzle of free checking, one factor is that the bank benefits from access to depositors' money without having to pay interest.[63] The bank is not doing customers a favor but rather providing the transactions services in exchange for the use of money.

62. For a discussion of free checking, see Justin Pritchard, *How Free Checking Really Works*, ABOUT.COM, http://banking.about.com/od/checkingaccounts/a/freechecking.htm (last visited Oct. 28, 2010).

63. *See id.*

An alternative means of offering transaction services would be for the bank to pay interest on money in checking and for the depositor to pay the bank for the transaction services that the bank provides. This organizational form would provide efficiencies. Banking customers would access transactional services only if the benefits of the services outweighed the costs of providing the services. With free checking, by contrast, depositors access transaction services even if the benefits of the services fall short of the costs because the costs are not paid by the depositors.

So why do banks offer free checking rather than charging for services? Income tax may be one important reason. If the banks offered interest on checking and required consumers to pay for the services, the interest would be taxable while the transaction charges would be nondeductible.[64] By offering free checking, banks give customers nontaxable imputed interest income rather than taxable interest. The income tax benefits of structuring checking accounts in this manner may outweigh the additional costs of processing inefficient transactions. Thus, income tax code asymmetries cause taxpayers to overconsume financial services and make the financial sector larger than it might otherwise be.

While this may seem like a trivial example of income tax increasing the size of the financial sector, it is quantitatively significant. As described above, the value of cash and checking accounts is approximately $1.7 trillion. At a 3% imputed interest rate, this is $50 billion in annual untaxed imputed interest income taking the form of the provision of transaction services.[65]

2. *Securitization*

While free checking is a simple example of tax distortions causing overproduction of financial services, the asymmetry of tax treatment between the benefits and costs of liquidity encourages the overprovision of liquidity in other contexts. Consider "securitization." Securitization is "the process of taking an illiquid asset, or group of assets, and through financial engineering,

64. For evidence of nondeductibility, see Rev. Rul. 82-59, 1982-14 I.R.B.

65. The example may have wider applicability. Holders of interest-bearing accounts also cannot deduct check-writing fees, but they may be able to deduct account management fees. *See id.* This encourages financial services providers to charge a fixed service fee rather than charge for writing checks, even though check-writing fees more closely approximate the marginal cost of serving the account. Again, the effect is to encourage the excess consumption of financial services.

transforming them into a security."[66] Securitization is associated with benefits and costs that are examined in this Subsection. One of securitization's benefits is a tax benefit analogous to the tax benefit associated with free checking.

a. The Benefits of Securitization

One of the primary benefits of securitization is liquidity. Securitization transforms home mortgages from the archetypal illiquid investments that are "never supposed to leave" the bank lending the money into "pieces of paper [that can] be sold . . . to anyone with money to invest."[67] Any investor holding securitized mortgages can sell them quickly and cheaply to other investors should an unanticipated liquidity need arise.[68]

The theory developed in Parts I and II demonstrates that enhanced liquidity lowers the absolute return that mortgages and mortgage bonds must yield. A bank considering making a mortgage loan knows that it may sell the loan to a securitizer should the need arise, enabling the bank to charge a lower rate to the borrower. The creation of the mortgage-backed securities market, by enhancing the liquidity of the investment, thereby lowered the return demanded by investors for a given loan.[69]

66. *What Is Securitization?*, INVESTOPEDIA, http://www.investopedia.com/ask/answers/07/securitization.asp (last visited Apr. 20, 2010).

67. MICHAEL LEWIS, LIAR'S POKER: RISING THROUGH THE WRECKAGE ON WALL STREET 85 (1989).

68. While this description focuses on the liquidity benefits of securitization in the mortgage market, securitization offers liquidity benefits for almost any type of financial asset. Take intellectual property for example. Consider the well-known securitization of the future proceeds of music sales by David Bowie. In exchange for bonds backed by the future proceeds of the music sales, investors provided an initial sum of cash. *See, e.g.*, Sam Adler, *David Bowie's $55 Million Haul: Using a Musician's Assets To Structure a Bond Offering*, ENT. L. & FIN., Aug. 1997, at 1; Christopher L. Peterson, *Predatory Structured Finance*, 28 CARDOZO L. REV. 2185, 2207 (2007) (discussing the Bowie music securitization). What had previously been an illiquid asset held by Bowie instead became an ordinary bond that could be bought and sold in a bond marketplace.

69. Liquidity is not the only benefit of securitization. Security also diversifies risk. A securitized mortgage bond includes many different mortgages, so its value is much less subject to the idiosyncratic risks of one borrower or region. Note, however, that this diversification can also be achieved by having a bank make many different mortgages in a number of regions. By contrast, it is difficult to conceive how individual mortgages could be made liquid without pooling and securitizing them.

Home mortgage securitizations have also benefited from the involvement of government-sponsored enterprises–such as Fannie Mae, Freddie Mac, and Ginnie Mae–that issued securitized home mortgage bonds and benefited from implicit government

b. *The Costs of Securitization*

The liquidity benefits of securitizations do not come free. Securitizations involve a number of costs. Most simply, there is considerable administrative expense in assembling mortgages for securitization and then packaging them for investors. Lawyers, investment bankers, and bond sellers all reap considerable fees from the process of securitization.[70]

In addition to these fiscal, administrative costs, securitization creates a noteworthy moral hazard problem. When banks resell the mortgage loans that they make, they do not bear the full risk of making bad loans. As a result, the banks may be less vigilant about monitoring credit quality than they would be if they retained all of their mortgage loans.[71]

These moral hazard problems proved to be extremely important during the financial crisis of 2007-09. Descriptions of the housing bubble and crash are replete with tales of moral hazard in action, as mortgage originators lent freely, paying little attention to credit quality. Ironically, during the financial crisis of 2007-09, this moral hazard problem became so salient that the liquidity of the securitized mortgage pools was severely compromised. Investors demanded steep discounts to buy securitized assets because they had so little confidence in the quality of the underlying mortgages.[72]

c. *Amounts of Securitization and Taxation*

Efficient securitization balances the benefits of the liquidity created by securitization against the administrative and moral hazard costs of creating this liquidity. If neither absolute return nor liquidity is taxed, then securitizations should occur whenever their liquidity benefits (in terms of forgone illiquidity costs) meet or exceed the costs of creating the securitized asset. When yield is taxed but liquidity is untaxed (and illiquidity costs are partially nondeductible), some assets will be securitized even when the costs of the

guarantees. These guarantees further encouraged the development of securitization in the mortgage area. *See* Peterson, *supra* note 68, at 2198-99.

70. *See* Robert DeYoung & Tara Rice, *How Do Banks Make Money? The Fallacies of Fee Income*, 28 ECON. PERSP., no. 4, 2004, at 34.

71. *See, e.g.*, Karl S. Okamoto, *After the Bailout: Regulating Systemic Moral Hazard*, 57 UCLA L. REV. 183 (2009).

72. A lemons problem appeared to unravel the market for securitizations. *See* George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 488 (1970) (showing that markets can unravel under some circumstances when sellers know more about the quality of assets than buyers do).

securitization exceed the benefits, creating an inefficiently large amount of securitization.[73]

Examining Figure 2, suppose that an investment bank can transform an illiquid mortgage loan into a liquid securitized asset at a price between $P1$ and $P2$. If there were no income taxes or if the costs of illiquidity were deductible, then investors would value the liquidity at less than $P1$. From a social perspective, the value of the securitization falls short of its cost, so the securitization should not go forward. When income taxes are introduced, however, liquidity becomes more attractive. Investors are now willing to pay more than $P2$ for the liquidity associated with the securitized asset. As a result, the securitization occurs even though the social value of the liquidity is lower than the social costs of securitization.

Because taxes on yield are quite high and the costs of illiquidity are at best partially deductible, there may be a significant amount of such inefficient securitization. Given the pivotal role of securitizations in the housing bubble and subsequent financial crisis, it is plausible that the tax subsidy for liquidity played a supporting role in setting the conditions for the crisis.[74] Regulation of securitizations, which is a critical part of many financial reform proposals, does not address the possible tax subsidy for liquidity and therefore may not provide a comprehensive solution to the problems of over-securitization.

3. Public Equity Trading

Becoming a publicly traded corporation entails significant benefits and costs. The benefits of public trading include considerably higher liquidity and concomitantly lower costs of capital. The costs of public trading include having to comply with an exhaustive list of regulations from securities regulators and stock exchanges and dealing with the principal-agent problems introduced by having a diffuse shareholder base. Taxing yield but not liquidity alters the tradeoff between the costs and benefits of going public and encourages some companies to go public when the costs of public trading exceed the benefits.

73. *See supra* Figure 2.

74. Note that, to put it mildly, the true costs of securitizations (in the form of moral hazard) were higher than anticipated. This problem, which was at the heart of the financial crisis, was not caused by the income tax code. The asymmetric tax treatment of liquidity and yield simply meant that the size of the error was larger than it might have been otherwise.

a. The Benefits of Public Trading

A recent article on the tradeoffs of being listed on a public stock market exchange describes the benefits as follows:

> [A public stock offering] leads to the development of a trading market for the company's shares, typically through a New York Stock Exchange or NASDAQ Stock Market listing. An active trading market greatly enhances liquidity by minimizing search, bargaining, and other transaction costs associated with selling shares. Once a trading market is established, pre-IPO investors and insiders can easily cash out some or all of their holdings by selling their shares into the market. With the exception of large block sales, a trading market eliminates the need to search for a willing buyer and to then negotiate the transaction.[75]

Adding liquidity reduces investors' expected illiquidity costs. As a result, investors demand less of an absolute return to hold the asset. This reduction in returns demanded by owner-investors constitutes the primary benefit of going public from a corporation's perspective.[76]

b. Costs of Becoming a Publicly Traded Company

To become a publicly traded company, public issuers must incur a number of costs and fees. Some of these costs must be borne up front, such as the underwriters' charge of 7% of gross proceeds in order to bring a company public.[77] The total direct cost of taking a company public is 11% of proceeds.[78] This cost does not include the time expended by corporate employees in the IPO process.

Once public, a company must comply with an ever-increasing array of disclosure and other governance requirements that have significant annual

75. William K. Sjostrom, Jr., *The Birth of Rule 144A Equity Offerings*, 56 UCLA L. REV. 409, 432-33 (2008) (citations omitted).

76. *See id.* at 432-35. Other benefits of becoming a publicly traded company include enhanced visibility and credibility, better access to capital markets for future funding needs, and better monitoring as a result of the scrutiny of public markets. *See* MARK GRINBLATT & SHERIDAN TITMAN, FINANCIAL MARKETS AND CORPORATE STRATEGY 79-80 (2d ed. 2002).

77. *See* Hsuan-Chi Chen & Jay R. Ritter, *The Seven Percent Solution*, 55 J. FIN. 1105 (2000). These costs are likely to be capitalized by the corporation. *See* Indopco, Inc. v. Comm'r, 503 U.S. 79 (1992) (requiring capitalization of fees paid to financial advisers and legal advisers relating to the sale of stock to an acquirer).

78. *See* GRINBLATT & TITMAN, *supra* note 76, at 80.

costs.[79] A 2007 study estimated that the average annual cost of being public for companies with annual revenue under $1 billion was approximately $2.8 million.[80] These direct costs do not include the nonfiscal costs of revealing a company's business model through mandatory public filings or the costs to company employees of engaging with a diverse shareholder base.

The costs of going public are not uniform across companies. Some companies are idiosyncratic in ways (for example, management comfortable with public scrutiny) that make it relatively cheap for them to go public, while other companies will have features (for example, a secretive business plan) that make going public more expensive. This implies an upward-sloping liquidity supply curve. More companies are willing to bear the costs of going public when the benefits are high than when the benefits are low as in Figure 2.

c. Publicly Traded Companies and Taxation

As one financial economics textbook states, "a firm should go public when the benefits of doing so exceed the costs."[81] If the costs of going public are treated appropriately from a tax perspective,[82] then the income tax code will not distort the decision to go public so long as the benefits of going public in the form of enhanced liquidity, and thus reduced absolute return, are also taxed appropriately. But liquidity benefits are not taxed appropriately. Instead, liquidity is overvalued because its benefits go untaxed while the costs associated with illiquidity are only partially deductible. As a result, more firms may go public than would be socially efficient.

The argument is by now a familiar one. Suppose, as in the case of securitizations, that the annualized cost of going public for Company *A* is between *P*1 and *P*2 and that, without tax, going public yields liquidity benefits to investors in Company *A* of less than *P*1 (see Figure 2). In a world without an income tax (as with the nontax liquidity demand curve in Figure 2), Company *A* would not go public. If the extra absolute return that the company pays as a result of not being public is taxable while the costs of this illiquidity to investors are nondeductible, then the benefit of public trading to investors rises

79. *See, e.g.*, Roberta Romano, *The Sarbanes-Oxley Act and the Making of Quack Corporate Governance*, 114 YALE L.J. 1521 (2005).

80. *See* FOLEY & LARDNER LLP, THE COST OF BEING PUBLIC IN THE ERA OF SARBANES-OXLEY (2007), *available at* http://www.foley.com/files/tbl_s31Publications/FileUpload137/3736/Foley2007SOXstudy.pdf.

81. GRINBLAT & TITMAN, *supra* note 76, at 87.

82. If the costs of going public are overtaxed, then the bias in favor of liquidity may offset the bias against going public created by the overtaxation of the costs of going public.

to a level above *P*2. Company *A* now chooses to go public, even though the social costs of going public are greater than its benefits. The asymmetry between taxation of absolute return and the partial nontaxation of liquidity (and nondeductibility of illiquidity costs) may therefore lead to considerable efficiency losses through the overproduction of liquid publicly traded companies.

4. The Size of the Financial Sector and the Production of Liquidity

Checking accounts, securitizations, and initial public offerings share a salient feature: in all cases, added liquidity is produced by the financial sector. Indeed, the provision of liquidity combined with the allocation of capital to long-term projects constitutes the primary service of the financial sector of the economy in many models of finance. When the primary product of the financial industry enjoys the favorable side of a tax asymmetry,[83] then the financial industry assumes a larger size. As a result, the tax asymmetry between liquid and illiquid assets engenders an inefficiently large financial sector.

The upward-sloping liquidity supply curve described above defines much of the financial industry. For a cost, financial professionals "make markets" and thereby create liquidity where it previously did not exist (as just described for the cases of securitizations and initial public offerings of stocks and bonds).

On a smaller scale, banks make markets between those who need capital and those willing to provide it.[84] Without banks, the market for capital would be far less liquid. If Person *A* grants a loan to Person *B*, then Person *A*'s savings will be much less liquid than if Person *A* deposits money with a bank that gives loans to many people. If Person *A* suddenly needs money, it is likely that at least one of the people who borrowed from the bank (for instance, Person *Z*) will no longer need the capital borrowed from the bank. The bank links Person *A* and Person *Z*, providing extra liquidity for Person *A*. As with securitizations and public offerings, there is a cost of making this market. Creating a banking institution where none previously existed creates moral hazard and administrative costs. The bank needs staff and physical spaces to serve as an intermediary, and the bank's employees may not be as careful making loans with Person *A*'s money as Person *A* would be.

83. Not all financial products that provide liquidity enjoy a tax-advantaged status. Credit card interest, for example, is not deductible under § 163(h) of the Internal Revenue Code.

84. *See, e.g.*, Anil K. Kashyap, Raghuram Rajan & Jeremy C. Stein, *Banks as Liquidity Providers: An Explanation for the Coexistence of Lending and Deposit-Taking*, 57 J. FIN. 33 (2002).

When more markets are made, there is more liquidity. Nontaxation of liquidity and taxation of yield make liquidity more desirable, facilitating the creation of markets that would not be worthwhile if liquidity did not enjoy a tax preference. More markets entail a larger financial sector, as some of the liquidity creation provided by the financial services sector becomes attractive only when the sector's primary product enjoys a tax preference.

A larger financial sector is not the only distortion created by asymmetric taxation of liquid and illiquid financial assets. Any activity that produces liquidity may be overproduced. For example, in recent years, many have argued that rules in property law are the result of a need for standardization that produces liquidity.[85] If liquidity is tax-favored, the private sector may overproduce optional standardization because such standardization produces tax-favored liquidity. Another distortion may take the form of clientele effects, wherein taxpayers hold liquid or illiquid assets not on the basis of their liquidity needs but rather because of their tax status.

B. Clientele Effects and the Nontaxation of Liquidity

Investors face a wide variety of tax rates. "Tax clienteles" arise when investors with different rates choose to hold different assets.[86] One common clientele effect occurs in the tax-exempt mutual bond market. Higher-bracket taxpayers are willing to pay more for tax-exempt bonds than low-bracket taxpayers are, because the value of the tax exemption is higher for those in a higher bracket. As a result, tax-exempt municipal bonds are held by those with high marginal tax rates.

Tax clientele effects may be inefficient. High-bracket taxpayers may not be the ideal holders of tax-exempt bonds from a risk-tolerance perspective, for example, but they hold the bonds for tax purposes, rather than as part of a portfolio chosen on the basis of risk and return.

1. Tax Status as a Determinant of Liquidity Holdings

The taxation of absolute return, the nontaxation of liquidity, and the partial nondeductibility of illiquidity costs create tax clientele effects in asset holdings.

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85. *See, e.g.*, Thomas W. Merrill & Henry E. Smith, *Optimal Standardization in the Law of Property: The* Numerus Clausus *Principle*, 110 YALE L.J. 1 (2000).

86. *See* Michael S. Knoll, *Taxation and the Competitiveness of Sovereign Wealth Funds: Do Taxes Encourage Sovereign Wealth Funds To Invest in the United States?*, 82 S. CAL. L. REV. 703, 722 n.117 (2009).

High-bracket taxpayers will hold assets that offer high amounts of untaxed liquidity, even if the high-bracket taxpayers' need for liquidity is low.

Suppose that Asset *IL* cannot be transformed into Asset *L* at any price. In this Subsection, suppose further that there are two types of investors rather than just one. The first type of investor (called "Private Sector") is identical to the investor discussed in the example in Subsection I.A.1, with a probability of a liquidity shock of 50% and liquidity costs (c) of $0.20. Private Sector is subject to the same income tax as the one described in Subsection II.A.1 with illiquidity costs that are 40% deductible and an income tax rate of 50%. The second type of investor (to be called "Nonprofit") is not subject to any tax. Nonprofit values liquidity more than Private Sector because Nonprofit has higher illiquidity costs of c=$.30 and the same probability of having a liquidity shock (50%). Nonprofit is not subject to income tax. Each type of investor demands one asset for its portfolio.

Without taxation of yield, Private Sector holds illiquid Asset *IL* and Nonprofit holds liquid Asset *L*. This is because Private Sector has lower illiquidity costs than Nonprofit. Private Sector is willing to receive an absolute return premium of 10% for Asset *IL*.[87] Nonprofit, by contrast, requires an absolute return of 15% to hold Asset *IL*.[88] At an absolute premium of anywhere between 10% and 15%, Private Sector prefers to hold Asset *IL* while Nonprofit holds Asset *L*.

Now, however, introduce a tax on yield of 50% for Private Sector, with Nonprofit remaining untaxed on yield. Private Sector now demands a return of 16% to hold Asset *IL* rather than Asset *L*.[89] Nonprofit, by contrast, remains willing to accept an absolute return illiquidity premium of 15% to hold Asset *IL*. At an absolute return illiquidity premium of 15% to 16%, Private Sector prefers to hold Asset *L*, while Nonprofit prefers Asset *IL*. This asset allocation is inefficient. Nonprofit has higher expected illiquidity costs than Private Sector but holds the illiquid Asset *IL*, because illiquidity's adverse tax consequences cause Private Sector to avoid the illiquid asset.

87. *See supra* Subsection II.A.1.

88. Expected utility for Nonprofit is given by $EU(L)=pu(x_1)+(1-p)u(x_2)$, where x_1 is consumption in the event of a liquidity shock and x_2 is consumption when there is no liquidity shock. If investors are risk-neutral, then utility is given by $u(x)=x$. Asset *L* therefore has expected utility of 1. To make a risk-neutral investor subject to liquidity shocks indifferent to Asset *L*, Asset *IL* must give the same expected utility. Plugging in a 50% chance of a liquidity shock implies $1=0.5(R-0.3)+0.5R$. Thus, R=$1.15, implying a 15% absolute return over Asset *IL*'s purchase price of $1.

89. *See supra* note 49 and accompanying text.

The core prediction of this example—that a difference in tax rates will cause inefficiencies as investors hold assets with differing liquidity for tax reasons rather than liquidity preferences—will persist in more complicated models. If Nonprofit can divide its asset holdings between liquid and illiquid assets, then the increase in yields on illiquid assets necessitated by the imposition of tax on those yields will skew Nonprofit's investments toward illiquid assets. Conversely, Private Sector's asset portfolio will be skewed toward liquidity because the preferred tax treatment of liquidity with respect to yield is most valuable for those in high tax brackets.

2. *Why Do University Endowments Hold Illiquid Assets? Tax Motivations in Addition to "Long-Term Horizons"*

The "Yale Model" of institutional investing, pioneered by David Swensen, manager of Yale University's endowment, has been widely hailed for increasing endowment returns for large nonprofit institutions.[90] The Yale Model has been adopted at many nonprofit institutions over the last several years.[91]

The Yale Model focuses on holding illiquid assets. According to one description of the investment model pioneered by Swensen:

> He contended that keeping funds in investments that are more liquid—that is, easily converted into cash—is more valuable to short-term players than to endowments, which can afford to wait until private assets are sold or go public. He brushed aside concerns that most alternative investments are tied up for years and therefore illiquid. "Investors should pursue success, not liquidity," he wrote. "Portfolio managers should fear failure, not illiquidity." And again: "Accepting illiquidity pays outsize dividends to the patient long-term investor."[92]

The Yale Model's outsize returns are directly related to its acceptance of illiquidity. In the Swensen explanation for the Yale Model, these high returns are "rents" that institutions earn for being patient long-term investors with little need for liquidity.[93]

90. *See* Daniel Golden, *Cash Me if You Can*, CONDE NAST PORTFOLIO, Mar. 18, 2009, *available at* http://www.portfolio.com/executives/2009/03/18/David-Swensen-and-the-Yale-Model/index.html.

91. *Id.*

92. *Id.* (quoting DAVID SWENSEN, PIONEERING PORTFOLIO MANAGEMENT: AN UNCONVENTIONAL APPROACH TO INVESTMENT 93 (2000)).

93. *See Liquidity and Asset Prices*, *supra* note 1.

While the notion that universities are long-term investors is compelling, the way in which universities with endowments following the Yale Model responded to the financial crisis partially belies the "long-term investor" explanation for endowments' disproportionate allocation to high-yielding illiquid assets.[94] Long-term investors with little need for liquidity do not slash payroll expenses and capital expenditures in response to a market decline, offer to sell illiquid assets at very low prices in down capital markets, or scramble to borrow money to meet payroll.[95] Apparently, universities do have some use for liquidity, which would have obviated the need for many of these behaviors.[96]

Clientele effects provide a complementary reason for the popularity of the Yale Model of Investment among university endowments. Whatever a university's liquidity needs, its nonprofit status means that their marginal tax rate is lower than that of most other investors. As the previous Subsection explained, a low marginal tax rate draws low marginal tax investors to high-yielding illiquid assets. University endowments may well be patient investors, but that is not the sole reason that they are attracted to illiquid assets. The high return required by taxable investors for illiquid assets due to the asymmetric taxation of liquid and illiquid assets offers another reason for endowments to choose illiquid investments.

IV. THE TAX STATUS OF ILLIQUIDITY IN BROADER PERSPECTIVE: INCOME TAX FEATURES BENEFITING ILLIQUIDITY AND OTHER "SOLUTIONS" TO THE TAX ASYMMETRY BENEFITING LIQUIDITY

The previous Parts of this Article demonstrated that liquidity is a valuable feature of an asset, making it cheap and simple for investors to purchase consumption. In the highly stylized version of the income tax presented to this point, these imputed transaction services from liquid assets are untaxed. Illiquid assets offer a taxable higher absolute return to compensate investors for the accompanying higher costs of obtaining consumption. Moreover, many of these costs of obtaining consumption are nondeductible, including the "shoe leather costs" of converting illiquid assets into consumption and the use of alternative sources of liquidity (such as credit cards) that have nondeductible

94. This response may have been disproportionate. The Yale Model does not require that endowment fluctuations be followed by related swings in spending from the endowment.

95. *See, e.g.*, Nina Munk, *Rich Harvard, Poor Harvard*, VANITY FAIR, Aug. 2009, at 106.

96. This is not to say that universities cannot be long-term investors but rather to emphasize that their lack of need for liquidity had been exaggerated.

costs. The net result is that liquid assets receive preferential tax treatment relative to illiquid assets.

The actual tax code, however, contains many provisions (such as the realization requirement) that, while not aimed at a tax asymmetry between liquid and illiquid assets, affect the relative tax burdens of liquid and illiquid assets. While liquidity is favored in the stylized version of the income tax code examined to this point, other features of the income tax mitigate or negate the bias toward liquidity identified here. A complete view of the tax status of liquid versus illiquid assets requires consideration of these other elements of the income tax. Moreover, the impact of income features such as the realization requirement on the tradeoff between liquid and illiquid assets provides a new perspective for examining some oft-debated features of the income tax code.

In addition to examining the impact of existing income tax provisions on the pro-liquidity tax bias identified in this Article, this Part also considers changes to the tax system that would reduce or eliminate the pro-liquidity bias.

Tax-induced distortions between liquid and illiquid assets can be mitigated in one of two directions. Either the tax burden on illiquid assets can be reduced or the tax burden on liquid assets can be increased. Which approach is appropriate hinges on a fundamental normative debate about the appropriate conception of income and consumption. Are the resources that an individual consumes in acquiring "end use" consumption properly treated as part of income?[97] If these expenses are part of a normative income tax base, then the appropriate solution is to tax the imputed transaction services of liquid assets or to add to the income tax burden on liquid assets. If such transaction costs are not part of the normative income tax base, then deductions for illiquidity costs should be pursued or the tax burden on illiquid assets should be diminished. The remaining Sections do not take a position on this normative question, focusing instead on the possibility of implementing any solution to the existing tax asymmetry between liquid and illiquid assets.

97. Consumption taxes face similar problems defining what is consumption versus investment in the taxation of financial services. *See, e.g.*, Alan Schenk, *Taxation of Financial Services (Including Insurance) Under a U.S. Value-Added Tax*, 63 TAX L. REV. 409, 410 (2010) ("[T]he taxation of financial services and insurance is as complex as it is under the VATs around the world . . . [because] the value of many financial and insurance services is buried in interest rates or measurable by a margin.").

A. The Role of Existing Income Tax Features in Increasing or Reducing the Distortions in the Market for Liquidity

If the income tax code gives preferential treatment to liquid assets as emphasized above, then other offsetting preferences (in the form of deviations from a Haig-Simons tax)[98] for illiquid assets may mitigate that distortion. Alternatively, the pro-liquidity distortion could be mitigated by introducing a tax penalty for liquid assets. The current income tax code already contains a number of deviations from a Haig-Simons tax that have such properties. As a result, the total amount of distortion to the production of liquid versus illiquid assets is unknown. Considering all deviations from a Haig-Simons tax in the code, the tax code may not penalize illiquidity or may even subsidize it. However, the value of such deviations from a Haig-Simons tax in reducing distortions between liquid and illiquid assets should not be overstated. Each deviation introduces its own set of distortions. While the deviations may be offsetting with respect to the liquidity/illiquidity tradeoff, the deviations may produce considerable inefficiencies along other dimensions. As a result, a direct resolution of the asymmetric taxation of liquid and illiquid assets is preferable.

1. The Realization Requirement and Preferential Capital Gains Rates

The realization requirement, which taxes capital gains when they are realized rather than when they occur,[99] alters taxation of illiquidity premiums along a number of dimensions. Realization allows investors to defer taxation on gains until an asset is realized. Illiquid assets, which have lower rates of realization than liquid assets, benefit more from a longer average deferral period than do liquid assets. The gain from an easily tradable asset—such as a share of a large publicly traded company—gets realized more frequently than a hard-to-sell asset, such as a share in a closely held corporation. As a result, the average value of deferral is greater for an illiquid asset than for a liquid asset. The benefit of deferral is enhanced by the fact that long-term gains on assets, which will tend to grow larger when assets are held for longer periods, are taxed at preferential capital gains rates.[100]

98. A Haig-Simons income tax instantaneously taxes all accretions to economic power in the form of consumption and changes in wealth at identical rates. *See* GRAETZ & SCHENK, *supra* note 40, at 86-87.

99. For a discussion of the realization requirement, see *id.* at 144-61.

100. *See* I.R.C. § 1(h) (2006).

The realization requirement therefore narrows or eliminates the income tax code's distortion in favor of liquid assets. While illiquid assets are penalized by the nondeductibility of illiquidity costs, they benefit from the lower effective income tax rates implied by the realization requirement and the lower effective capital gains rates. Thus, the total tax burden on illiquid assets relative to liquid assets is uncertain. If the realization requirement effect is greater, then liquid assets may be underproduced because of income tax distortions.

Of course, the realization requirement's reduction of the income tax distortion in favor of liquidity comes at great (and well-studied) costs.[101] The lock-up effect, for example, creates a realization-induced form of illiquidity that may have considerable costs. Moreover, the realization requirement's role in reducing distortions in the market for liquidity could be more directly accomplished through more targeted reforms, such as an ex ante income tax,[102] mentioned below.

In spite of these important caveats, the realization requirement's role in mitigating distortions in the market for liquidity constitutes a hitherto unmentioned argument on its behalf, particularly if more direct forms of reducing the distortions are impractical. The "breaks" to illiquid assets given by the realization requirement and the preferential rates for capital gains can be justified on the grounds that illiquid assets are overtaxed by the nondeductibility of many illiquidity costs and therefore deserve an offsetting subsidy. The Article now turns to similar arguments that can be made on behalf of the corporate tax.

2. *Corporate Taxation*

Because limited liability for nonpublicly traded firms can be achieved without incurring double taxation, the present corporate tax represents a form of double taxation on publicly traded corporations. As a general matter, such double taxation is viewed as inefficient. A tax on public trading, however, mitigates the tax distortion in the decision to become publicly traded caused by tax asymmetries on liquidity versus yield.

As detailed above,[103] the liquidity associated with public trading confers a tax advantage relative to the yield that must be paid for an identical private

101. For a discussion of the realization requirement's costs and a different argument on its behalf, see David M. Schizer, *Realization as Subsidy*, 73 N.Y.U. L. REV. 1549 (1998).

102. An ex ante income tax taxes expected returns rather than actual returns. *See infra* Subsection IV.C.3.

103. *See supra* Subsection III.A.3.

company that is less liquid. Investors holding the public company's stock pay less in expected taxes than investors holding the otherwise identical private company's stock that is hard to trade. As a result, an inefficiently high number of corporations may choose to go public.

The introduction of a tax on companies that go public, however, reduces or eliminates the taxation and liquidity inducement for companies to go public. While the liquidity associated with going public is tax-favored in comparison to absolute return, the corporate tax imposes a countervailing unique tax burden on publicly traded companies. The net tax effect of the liquidity bias in favor of going public and the avoidance of double taxation bias in favor of staying private is unclear.

As argued by Knoll, the corporate tax is a blunt instrument for measuring the benefits of liquidity.[104] There is no obvious reason why the benefits of liquidity are a function of profits, but the corporate tax is a tax on profits. The corporate tax also introduces many well-known distortions, such as a preference for debt and retained earnings rather than dividends.

As with the realization requirement, mitigation of distortions to the market for liquidity constitutes a hitherto underemphasized efficiency argument on behalf of corporate taxation.[105] But the argument for corporate taxation as a tax on liquidity implies a different normative income tax base from the one suggested by the argument for the realization requirement. While the realization requirement provides an ad hoc solution to tax asymmetries favoring liquidity by reducing the tax burden on illiquidity (thus implying the normative judgment that transaction services should not be included in the normative income tax base), the corporate tax provides an ad hoc solution to the liquidity/illiquidity asymmetry by raising taxes on liquidity, thereby implying that the benefits of liquidity belong in the normative income tax base. As with the realization requirement, mitigation of distortions to the market for liquidity as played constitutes a previously unstated efficiency argument on behalf of corporate taxation. Again, as with the realization requirement, there are better means of mitigating the distortions to the market for liquidity than the ad hoc format of a corporate tax.

104. *See* Knoll, *supra* note 5, at 592-93.

105. Rudnick, *supra* note 5, is the original source for the argument for a corporate tax as a liquidity tax. Rudnick's article, however, does not place a corporate tax as one of a long menu of "solutions" to a general problem of asymmetric taxation of liquid versus nonliquid assets.

B. Deductions for Illiquidity Costs

Direct attention to the factors causing asymmetries between taxation of liquid and illiquid assets offers a potentially more efficient avenue for removing distortions. For example, Part II discussed the nondeductibility of many illiquidity costs. To review, some of the sources of nondeductibility include limitations on deducting losses from selling illiquid assets rapidly in the face of a liquidity shock, limitations on the deductibility of investment-related transaction costs (such as check-writing fees), limitations on the deductibility of the costs of alternative sources of liquidity (such as credit card interest), and the nondeductibility of the nonpecuniary costs of liquidity (such as the shoe leather opportunity cost of the time spent converting illiquid assets into liquid assets). If all of these restrictions on deductibility could be eliminated, then income taxes would not distort the market for liquidity as described in Part II.

Enabling all of these costs to be deducted would indeed remove the distortion for holding liquid versus illiquid assets. Such reforms would introduce several other distortions, however. As a result, they are unlikely to occur. Limitations on deductibility of capital losses were enacted to protect the income tax from abuses of the realization requirement and to inhibit the development of tax shelters.[106] Similarly, personal debt obtained for liquidity reasons is nearly impossible to disentangle from debt acquired purely for consumption purposes that many argue is appropriately taxed.[107] Likewise, allowing deductions for the opportunity costs of obtaining liquidity raises the risk that taxpayers will attempt to describe some percentage of their leisure time as engaged in obtaining liquidity and other consumption.

Because of these complications, it is practically impossible to enable all illiquidity costs to be deducted. If the income tax distortion between liquid and illiquid assets is to be eliminated, other tax solutions must be pursued.

C. Taxing Imputed Income from Liquidity

If the costs of illiquidity cannot be made deductible, perhaps the benefits of liquidity can be made taxable. Note that full taxation of imputed income from liquidity would overtax liquid assets relative to illiquid assets because some of the costs of illiquidity are deductible. Instead, a partial tax on the benefits of liquidity would be ideal. There are several means of taxing imputed transactional services from liquidity.

106. *See, e.g.*, GRAETZ & SCHENK, *supra* note 40, at 388-418.

107. *Id.*

1. *Imputation of Income from Liquidity*

Direct imputation of income from liquidity associated with financial assets requires establishing a benchmark rate of absolute return for an extremely illiquid asset with a given risk profile. All assets with that risk profile should then be taxed on this rate of absolute return, regardless of their residual rate of return. If the true absolute return falls short of the benchmark return because an asset reduces illiquidity costs relative to the benchmark asset, then income should be imputed because the forgone absolute return represents an illiquidity premium. For example, suppose that perfectly illiquid restricted stock in Company *A* yields 19% and that relatively liquid publicly traded stock in Company *A* yields 10%. The publicly traded stock should have imputed income of 9% because the lower yield represents a liquidity premium. The imputed income of 9% could be taxed at the ordinary income tax rate, or it could be taxed at a lower tax rate, reflecting the fact some of the costs of illiquidity are deductible from income tax.

Directly imputing income to liquid assets ends the tax asymmetry between liquidity and illiquidity. If liquid publicly traded stock is taxed at the same rate as otherwise identical illiquid stock, then the tax motivation for holding liquidity disappears. Investors will hold a more liquid version of an asset only if the liquid asset's imputed return (in terms of illiquidity costs saved and absolute return) is greater than the absolute return of the extremely illiquid asset.

Although direct imputation of income from liquidity resolves the tax asymmetry between liquid and illiquid assets, direct imputation will be difficult to implement. Any system of direct imputation suffers from the problem of creating a benchmark rate of absolute return for a given risk profile. There are few instances of perfectly illiquid securities that have the same risk profile as other securities with more liquidity. While illiquidity premiums could be estimated and extrapolated, this process would be fraught with error and prone to dispute. As a result, a wealth tax offers a more feasible method of effectively taxing liquidity.

2. *A Wealth Tax as a Tax on the Imputed Income from Liquidity*

Wealth taxes offer a feasible means of removing tax asymmetries between liquid and illiquid assets.[108] A wealth tax taxes all forms of income associated

108. A wealth tax "is the economic equivalent of a normative income tax on the risk-free return." Deborah H. Schenk, *Saving the Income Tax with a Wealth Tax*, 53 TAX L. REV. 423, 441-42

with an asset, both pecuniary returns and imputed returns such as the transaction services associated with enhanced liquidity. As a result, a wealth tax does not distort the preference for liquidity versus yield (with the exception of wealth effects).

To demonstrate, consider investors with a choice between holding $100 cash or getting a 10% absolute return (such as rent payments) on $100 in illiquid real estate and borrowing from a credit card with a 10% interest rate for the inevitable consumption needs (of $99) greater than rental income. With a wealth tax of 1%, investors with $100 in cash or real estate are left with $99. If the wealth is held in cash, it enables the consumption of $99 directly. If the wealth is held in real estate, investors borrow $99 for consumption. Investors owe $9.90 of interest to the credit card issuer. They pay for this interest with the $9.90 in rent payments produced by their remaining real estate investment. In total, the wealth tax introduces no incentive for investors to hold liquid rather than illiquid assets.[109] An income tax, by contrast, makes cash more attractive than real estate (as described in the Introduction). While the benefits of wealth taxes from the perspective of taxation of risky and risk-free returns have been much discussed,[110] these discussions have taken place without consideration of the role of liquidity. Thus, the benefits of wealth taxes have been understated. Not only do wealth taxes potentially improve the efficiency of taxation of risk, but they also reduce distortions in the market for liquidity.

A wealth tax is no panacea. As many have mentioned, wealth taxes, like all ex ante taxes, may cause liquidity problems; they are levied on wealth that is potentially hard to transform into liquid form in order to pay taxes. Wealth

(2000). The ability of wealth taxes to accommodate liquidity services in the tax base was discussed in Knoll, *supra* note 5, at 592-93. However, Knoll's brief and illuminating discussion does not attempt to provide a thorough treatment of the impacts of taxation on the demand for liquid versus illiquid assets. For example, it does not discuss the deductibility of illiquidity costs in its analysis.

109. If the illiquidity costs represented by the interest costs are partially deductible, then a partial wealth tax and partial income tax would remove distortions between liquid and illiquid assets. If interest is 40% deductible, for example, then an income tax of 4%, combined with a wealth tax of 1%, would remove any distortion between liquid and illiquid assets. Under these circumstances, real estate would be taxed a total of $5 but would have $4 of deductions, for a net tax of $1. Cash would be taxed at $1.

110. For arguments in favor of taxes that impute income directly from capital as a method of more efficiently taxing returns from capital, see EDWARD D. KLEINBARD, BROOKINGS INST., REHABILITATING THE BUSINESS INCOME TAX 10 (2007), *available at* http://www.brookings.edu/~/media/Files/rc/papers/2007/06corporatetaxes_kleinbard/200706kleinbard.pdf; and Schenk, *supra* note 108. For a summary of arguments against the efficacy of wealth taxation, see Bankman, *supra* note 4.

taxes may also have inefficient general equilibrium effects, favoring consumption rather than investment. Moreover, these taxes suffer from the difficulty of placing valuations on hard-to-value assets.[111] Whatever the overall merits of a wealth tax, its ability to minimize distortions between liquid and illiquid assets is one of its most overlooked virtues.

3. Other Ex Ante Income Taxes as Solutions to the Asymmetric Taxation of Liquidity and Illiquidity

A wealth tax is akin to an income tax with an imputed rate of return on assets.[112] Other forms of ex ante income taxation also remove the asymmetry of taxation between liquid and illiquid assets. Alan Auerbach has proposed an ex ante income tax called the "Retrospective Capital Gains Tax" as a solution to many of the distortions caused by the realization requirement.[113] Auerbach's proposal imputes a rate of return to assets regardless of their actual yield but taxes assets when they are realized. The proposal ignores actual returns and instead imputes a standardized rate of return for whatever period in which the asset has been held. It is therefore an ex ante rather than ex post income tax. Provided that the class of assets subject to tax is sufficiently broad, Auerbach's ex ante tax not only resolves many realization-related distortions but also removes the distortions to the market for liquidity identified in this Article.

For example, suppose retrospective capital gains taxation applied to cash. Investors who hold cash are taxed on an imputed return of 10% annually when they "realize" the cash by exchanging cash for goods.[114] This tax structure makes investors indifferent between cash and real estate in the example provided in the Introduction.[115] Because retrospective capital gains taxation imputes a standardized rate of return to all financial assets rather than relying on actual rates of return, liquid assets with lower rates of return no longer enjoy a tax advantage.

111. For a comprehensive discussion of the benefits and disadvantages of wealth taxes, see generally Knoll, *supra* note 5, which discusses the ability of a wealth tax to tax some sources of income that are missed by an income tax; and Moris Lehner, *The European Experience with a Wealth Tax: A Comparative Discussion*, 53 TAX L. REV. 615 (2000), which discusses the problem of asset valuation for a wealth tax.

112. *See* Schenk, *supra* note 108, at 436.

113. Alan J. Auerbach, *Retrospective Capital Gains Taxation*, 81 AM. ECON. REV. 167 (1991).

114. In this analysis, cash is a capital asset.

115. *See supra* Introduction. If illiquidity costs are partially deductible, then a hybrid of Auerbach's proposal and an income tax would remove liquidity-related distortions.

CONCLUSION

Liquidity is a critically important imputed element of the benefit associated with holding assets that tax scholars have mostly overlooked. Tax asymmetries between the treatment of liquidity and return distort the market for liquidity, leading to mispricing of liquidity and the overproduction of liquid assets. Because the financial industry is the primary producer of liquidity, the nontaxation of liquidity facilitates an overly large financial sector. The nontaxation of liquidity also creates misallocations in the portfolios of asset holders. Low-rate taxpayers, such as nonprofit organizations, are encouraged to hold high-yielding illiquid assets, regardless of their need for liquidity.

Some oft-criticized elements of the current income tax, such as the realization requirement and corporate taxation, mitigate and may even eliminate the distortions to the market for liquidity, albeit in an ad hoc manner. The realization requirement reduces the tax burden on illiquid assets relative to liquid assets, mitigating the effect of the liquidity bias identified in this Article. The corporate tax, by contrast, places an extra tax burden on some liquid assets, reducing the distortion to liquidity in a direction that would be favored by those who consider liquidity services to be an appropriate part of the tax base. More direct solutions to the tax-induced distortions to the market for liquidity depend on the appropriate definition of income. If transaction services are properly included in the income tax base, then a wealth tax in fact taxes transaction services and absolute returns equivalently, eliminating the distortions. If transaction costs associated with purchasing consumption are properly excluded from the income tax base, then the costs of illiquidity should be fully deductible, again eliminating distortions in the market for liquidity.

This Article, however, cannot come close to exhausting the implications of the benefits of liquidity for taxation. For example, many businesses hold liquidity not for its consumption-purchasing qualities but rather for the options that it gives them when faced with uncertain investment opportunities and risks. These "real option" benefits of holding cash may be taxed very differently from how they should be under an ideal income tax. Problems such as this should be the subject of future research. This Article aims to offer a start in addressing the many issues presented by the interpretation of liquidity as imputed income from a financial asset.