

The Non-Taxation of Liquidity

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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 otherwise comparable illiquid assets. This article demonstrates that an income tax alters the trade-off between asset liquidity and yield because high yields from illiquid assets are taxed while imputed transaction services income from liquidity is untaxed. As a result, asset liquidity is overproduced 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, where low rate taxpayers, such as non-profit 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, corporate taxation, consumption taxes, wealth taxes, and transaction taxes.

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I. Introduction

Asset returns depend upon the liquidity of a security.² Cash, for example, yields no financial return, but individuals are nevertheless willing to hold cash because it provides transaction services, enabling individuals to purchase desired consumption quickly and easily. The connection between liquidity and asset prices demonstrates that the standard model where asset returns are determined by a tradeoff between risk and return is incomplete (at best). Indeed, the liquidity/return tradeoff provides a better explanation for the behavior of asset prices during the financial crisis of 2007-2010 than standard risk/return based theories.³

Tax scholars have examined the implications of risk/return tradeoffs for the appropriate taxation of assets for over fifty years.⁴ Scholars have also examined the impact of imputed income from real assets, such as housing, on the ownership of real vs. financial assets.⁵ The tax academy has almost

² Liquidity is defined as the “ease of trading” an asset. See Yakov Amihud, Haim Mendelson & Lasse Heje Pedersen, *Liquidity and Asset Prices*, 1 FOUNDATIONS AND TRENDS IN FINANCE 270 (2005) (hereinafter AMP). Some assets, such as stocks 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, etc..

³ See David Adler, *A Flat Dow for 10 Years? Why It Could Happen*, BARRON’S, December 28, 2009 (stating that “Economists known as the “liquidity movement” predicted the financial crisis”).

⁴ Domar, Evsey D. and Richard A. Musgrave, *Proportional Income Taxation and Risk-Taking*, 58 Q. J. ECON. 388 (1944). For a recent example, see David Weisbach, *The (Non) Taxation of Risk*, 58 TAX L. REV. 1 (2004) (reviewing the literature on the true nature of risk taxation) . See also Adam H. Rosenzweig, *Imperfect Financial Markets And The Hidden Costs Of A Modern Income Tax*, 62 SMU L. REV. 239, 239 (2009) (discussing how risk-return tradeoffs may subsidize trading in financial derivatives).

⁵ 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.”). For discussions of the possibility of imputed income from financial assets, see e.g., Jeff Strnad, *Periodicity and Accretion Taxation: Norms and Implementation*, 99 YALE L.J. 1817, 1834-1839 (1990) (discussing “intangible” benefits from wealth); Joseph Bankman, *What Can We Say About A Wealth Tax?* 53 TAX L. REV. 477, 481-82 (discussing intangible benefits from wealth) Deborah H. Schenk, *Saving the Income Tax With a Wealth Tax*, 53 TAX L. REV. 423 (2000)) . The imputed income discussed in these articles differs from liquidity along several dimensions. First, the value of such imputed income has much less empirical foundation (Strnad, at 1835 describes intangible benefits as “very hard to observe or estimate”) than the value of liquidity, which has robust empirical documentation, as discussed infra 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 value to tax liquidity. See also see Louis Kaplow, *Utility from*

entirely overlooked, however, the tax implications of the liquidity/return tradeoff. This Article begins an examination of the interaction of an income tax with the liquidity/return tradeoff.

Suppose an individual faces a choice about where to hold assets and how to purchase consumption. The individual can hold cash and receive no return or they can hold assets in a savings account and earn 2% interest. If the individual holds cash, then she pays for commodities with cash. If the individual holds a savings account, then she pays for commodities with a personal check. Merchants prefer payment in cash to payment via check (cash is more liquid) because there is some risk that the check will bounce and the merchant will go without payment (or alternatively, the merchant's bank charges a fee to deposit a check). The seller of the commodity therefore charges \$1 for payments made in cash but \$1.02 for payments made by check. Without an income tax, the individual is indifferent between holding cash or savings. Either asset enables her to buy one unit of the commodity. Cash yields no return, but the cheaper price for purchasing a commodity with cash makes up for the lack of return.

Once income taxes are introduced, however, the individual prefers to hold cash rather than savings. If income taxes are 50%, then the individual pays one cent of tax on savings, but none on cash. Moreover, the higher price for checks cannot be deducted. After taxes, holding savings no longer enables her to purchase one unit of the commodity. As a result, she will hold more liquid cash, which continues to enable her to purchase one unit.

This example demonstrates how income taxes distort the price and quantity of liquid assets relative to illiquid assets. In the transaction costs context just described, liquid assets like cash are priced too cheaply relative to non-liquid assets, because part of their "return" (in the form of making purchases cheaper and easier) goes untaxed. This price effect distorts the production of assets towards too much liquidity.

The tax advantages of low return liquid assets depend upon the income tax treatment of the costs associated with converting illiquid assets into consumption. If costs are fully deductible (e.g., the higher costs associated with checks can be deducted), then the income tax code no longer distorts the price and quantity of liquid vs. non-liquid assets. Indeed, it is even possible that illiquidity can be subsidized by implicit government provided "liquidity insurance" through the income tax code. In these circumstances, illiquidity may be overproduced rather than under-produced. As a result, the introduction of an income tax alters the liquidity/return tradeoff, but the direction and size of the tax distortion depends upon the details of the income tax. In the most reasonable description of the U.S. income tax for individuals, however, the costs associated with converting illiquid assets into consumption are sufficiently non-deductible that the income tax code distorts asset prices and quantities in favor of liquid assets.

Accumulation, (Nat'l Bureau of Econ. Research, Working Paper No. 15595, December 2009) (describing accumulation as a benefit of wealth).

The tax preference for liquidity potentially explains some portion of the proliferation of securitizations in the US and global economies. 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.⁶ 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) are equaled by 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 illiquidity cannot be fully deducted),⁷ then assets will be over-securitized.

Securitization is simply one example of the financial sector producing 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 is untaxed, then it will be overproduced and the financial sector will become overgrown as one of its primary outputs—liquidity-- is tax favored.⁸

The non-taxation of liquidity 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 return is subject to tax while liquidity is not taxed, however, low rate taxpayers collect rents from holding high return illiquid securities, encouraging them to hold illiquid securities regardless of their cash needs. Tax preferences, rather than the oft-argued “long term horizons”, may explain why untaxed university endowments disproportionately hold illiquid high yielding assets and are willing to slash costs rather than sell illiquid assets in times of market decline and illiquidity. These distortions create inefficiencies.

I then consider possible solutions to the distortions created by failing to tax the imputed return offered by liquid assets. Taxation of many forms of imputed income is impractical, in spite of the well known distortions that such non-taxation causes. Not so for the imputed income associated with liquidity. Replacing income taxes for investment income with wealth taxes would eliminate the bias towards liquidity, as the value of wealth taxes are not contingent on the form of return (yield or liquidity services)

⁶ Securitization also enables some diversification of risk. This aspect of securitization will be discussed below.

⁷ Throughout the Article, I will contrast the non-taxation of liquidity with the taxation of yield associated with illiquidity. For a distortion created by asymmetric taxation to exist, the additional costs associated with illiquid returns must also be non-deductible. For ease of exposition, I will at times contrast the non taxation of liquidity with the taxation of illiquidity premiums without adding the additional warning that added costs associated with illiquidity must be imperfectly deductible. I hope the reader excuses the shorthand.

⁸ 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 Federal Tax Reform, *Simple, Fair, and Pro-Growth: Proposals to Fix America's Tax System* 70 (2005) (arguing that the tax code encourages overinvestment in housing at the expense of other productive uses”).

but rather on the market value of the asset. Other forms of taxation, such as transaction taxes (in the form of the realization requirement) and corporate taxes, are also considered. Both of these forms of taxation add to the tax burden of liquid assets relative to non liquid substitutes. Transaction taxes and corporate taxes, however, “solve” the liquidity non taxation distortion in an ad hoc manner, and introduce other costs. As a result, they are likely less desirable than a wealth tax.

This Article proceeds as follows. For simplicity, I focus exclusively on a tradeoff between yield and liquidity, abstracting from the existence of a tradeoff between risk and return that has been the focus of much of the existing literature.⁹ Part I reviews the voluminous finance literature demonstrating that there is a tradeoff between liquidity and yield. Part III 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 IV applies the lessons of Part III to securitization markets and asset holdings by non-profit organizations, demonstrating that the distortions created by non-taxation of liquidity may be extremely important for the economy. Part V considers solutions to the distortions created by non-taxation of liquidity, such as wealth taxation and inflation. Part VI concludes and briefly speculates about the implications of liquidity non-taxation for the taxation of risk.

II. 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 section briefly 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.¹⁰ An asset may be easy or difficult to trade for two related reasons. First, there may be exogenous selling costs. For example, it may be impossible to sell assets without recourse to a broker or some other agent¹¹ who charges a fee for her services. Second, assets may be hard to sell for “demand pressure” and “inventory risk” factors.¹² Simply put, when an individual wants to sell an asset, the price that the individual gets does not always reflect the fundamental value of 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

⁹ See Viral Acharya & Lasse Heje Pedersen, *Asset Pricing with Liquidity Risk*, 77 J. FIN. ECON. 375 (2005) (for a model that embeds liquidity risk within the standard CAPM framework.)

¹⁰ AMP, supra note 2, at 270.

¹¹ This discussion draws from that of AMP, supra note 2, at 270

¹² “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 won’t come along or that they will have to sell the stock at a loss—the greater the compensation demanded by market makers.

sellers but few buyers, then the price will be lower than the fundamental value, introducing another cost of selling. Of course, the individual could choose not to sell the asset if the market conditions for the asset seem unfavorable. Holding on to the asset, however, prevents the individual from shifting assets when they might desire to do so. If an asset is prone to high transactions 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 in order to fund ordinary consumption that was formerly funded by their labor income. Or individuals may need cash in order to facilitate transactions from vendors who demand cash.¹³ Entrepreneurs may come across temporary investment opportunities that require the sale of assets in order to obtain the necessary capital. Large investment groups such as hedge funds may borrow money for investment and be required to post collateral in order to continue trading. If the investment group's collateral suffers a decline in value, the investment group may be required to post new capital by liquidating some assets.¹⁴

The desirability of liquidity and the positive costs of selling an asset predict that more illiquid assets should receive a higher return. An investor knows that they may have liquidity needs when she considers purchasing an asset. As a result, the investor does not consider only the stream of payments associated with an asset when determining the price to pay for the asset, but also how much it will cost to sell the asset in the event that she has liquidity needs. The higher the expected cost of selling the asset (the more illiquid the asset), the less the investor will pay for a given stream of payments. This price discount for illiquidity therefore translates into a higher return for a given stream of payments associated with the asset. The price discount will be greater when it is more expensive to sell the asset and when it is more likely that the investor will need liquidity and therefore be forced to sell the asset at a cost. This calculus will be made by all future buyers of the asset, so that the discount associated with illiquidity is equivalent to the "expected value of transaction costs through the asset's lifetime."¹⁵

The association between asset returns and liquidity may or may not be correlated with the well studied tradeoff between risk and return. In the example of the previous paragraph, consider

¹³ The cost benefit analysis of holding cash, with the benefit being the provision of transaction services and the cost being foregone yield from holding other assets is the subject of the Baumol-Tobin model of money demand. See William J. Baumol, *The Transactions Demand for Cash: An Inventory Theoretic Approach*, 66 Q. J. ECON. 545 (1952); James Tobin, *The Interest Elasticity of the Transaction Demand for Cash*, 38 REV. ECON. & STAT. 241 (1956); David Romer, *A Simple General Equilibrium Version of the Baumol-Tobin Model*, 101 Q. J. ECON. 663 (1986). The Baumol-Tobin model demonstrates that the tradeoff between liquidity and return is not simply a recent invention of academic finance.

¹⁴ See Markus Brunnermeier & Lasse 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).

¹⁵ AMP, *supra* note 2, at 279.

two assets with the same riskless payment streams. One of the assets is very easy and cheap to sell—perhaps it is traded on a market with high volume—while the other is costly to sell. The first asset will get lower returns, though the risk profiles of the two assets are identical—they are both riskless. It is the differential liquidity that causes the difference in asset returns.

In other cases, the liquidity and risk characteristics of an asset may be correlated. For example, risky assets may be more prone to illiquidity (have higher trading costs) than safer assets. In addition, liquidity may be weakest (trading costs highest) exactly when risky returns are lowest. Such factors may increase the return premium demanded for holding illiquid assets.¹⁶ For the purposes of simplicity, however, the remainder of this Article will focus on liquidity risk that is independent of the risk in returns.

B. 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 if anything even stronger.

1. Cross Sectional Evidence

Cross sectional studies compare returns for stocks with different liquidities,¹⁷ controlling for other determinants of return, such as risk. Most of these studies demonstrate that illiquid stocks or bonds have higher returns than more liquid stocks¹⁸ 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).¹⁹

2. “Natural Experiments” for the Value of Liquidity

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. Take two assets that are nearly identical in terms of their expected cash flows but have different liquidity

¹⁶ See Acharya and Pedersen, *supra* note 9.

¹⁷ 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).” Financial Industry Regulatory Authority (FINRA) Glossary, at <http://www.finra.org/Glossary/P010868> (visited April 9, 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?” at <http://www.smartmortgageconsultants.com/what-does-selling-or-buying-a-house-really-cost/> (visited April 9, 2010).

¹⁸ See AMP, *supra* note 2 at 305-317.

¹⁹ See Yakov Amihud and Haim Mendelson, *Liquidity and Stock Returns*, 42 FIN. ANALYSTS J. 43 (1986).

profiles, with one of the assets being easy to sell cheaply (liquid) and the other asset more difficult to sell. 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 “natural experiment of the value of liquidity.

a) Restricted Stock

In US 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 is therefore much more costly to sell, more illiquid.²⁰ Studies comparing returns for restricted vs. unrestricted stock estimate that if the unrestricted stock gets an average return of 10%, then the restricted stock typically yields around 19%.²¹ 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) Closed End Mutual Funds

There are other examples of financial instruments with identical cash flows but different liquidities yielding very different returns. Closed end mutual funds, for example, issue shares that give the shareholders the right to the cash flows of the funds’ underlying assets. Shareholders in closed end mutual funds cannot redeem their shares for cash from the fund manager, but they can sell their shares in the open market. Closed end funds trade at a discount to their net asset values. For example, if one share in a closed end fund gives one the right to one share of Company A and Company A trades at \$35, the closed end fund will generally trade at less than \$35. One popular explanation for this discount is that the closed end fund is less liquid than the shares of Company A.²² This is particularly true when the closed end fund owns a wide distribution of shares. While there are many people who will want to buy or sell shares of Company A at any time, making shares of Company A relatively cheap to sell, there will be fewer who want to buy the exact combination of shares entailed by the closed end fund. Thus, the closed end fund will be less liquid and trades at a discount, implying a higher return for otherwise identical securities.²³

c) Treasury Bills vs. 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

²⁰ 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.

²¹ AMP supra note 2, at 329-331.

²² AMP supra note 2, at 347.

²³ See AMP, supra note 2, at 347-349.

bill with a 10 year treasury note that is six months from expiring. At the present moment, both instruments involve a promise from the US government to pay a sum in six months time. The term and the payor are identical. The six month bill and the 10 year note with six months remaining trade in different markets, however. The six month bill market is far more liquid than the 10 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 10 year note with six months remaining. In fact, the more liquid six month bill yield almost 0.5% less annually than the 10 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.²⁴

The cross sectional evidence and the cases of restricted stock, closed end mutual funds, and the US 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. The estimated differences in yield associated with differences in liquidity are large enough to make an important difference in returns. With this established, the remainder of the paper will consider the tax treatment of liquid and illiquid assets, emphasizing that the return that investors forego by holding liquid assets is not taxed like the return itself would be.

III. The Price and Quantity of Liquidity In the Presence of Income Taxes

The previous section established that liquidity is a valuable feature of an asset for investors. Investors know that there may be some periods when they have an acute need for money, such as if they lose their job, have a suddenly high value of consumption (e.g., to pay for a wedding or for health care), or if they come across an unexpectedly good investment or educational opportunity that requires the input of capital. All things equal, a liquid asset that can be sold cheaply to meet the need for money in these circumstances is more valuable than an otherwise identical asset that cannot be sold quickly and easily to meet these unpredictable needs.

The existence of the liquidity/return tradeoff described above implies that liquidity is not only valuable, but it has a market price. Investors are willing to trade a certain amount of return for additional liquidity. Moreover, the market price of liquidity is economically meaningful. In the case of restricted stock, for example, investors require a premium of 9% annually to hold a stock that is extremely difficult to sell relative to an otherwise identical stock that is extremely easy to sell.²⁵

Liquidity therefore constitutes a hitherto overlooked example of imputed income. Imputed income refers to the “in kind” benefits received from property and/or labor.²⁶ Liquidity

²⁴ See Yakov Amihud and Haim Mendelson, *Liquidity, Maturity and the Yields on U.S. Government Securities*, 46 J. FIN. 1411 (1991).

²⁵ See supra Part II.B.2.

²⁶ See MICHAEL GRAETZ & DEBORAH SCHENK, *FEDERAL INCOME TAXATION* 119-122 (4th ed. 2001).

is an in kind benefit associated with property. 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.²⁷ This is an important oversight. Property does not simply offer a return (in either consumption value or in an increase in wealth). Rather, property also provides, to varying degrees, rapid access to other forms of consumption or investment when a person has an acute need for such access. Indeed, for some forms of property, such as checking accounts in a bank or cash holdings, this in kind return of access to consumption/investment constitutes the primary benefit associated with the property. And unlike many other forms of imputed income, liquidity has a market price that can be derived from asset price relationships.

Like many kinds of imputed income, liquidity is untaxed. And as in most cases of non-taxation of imputed income, the non-taxation of liquidity versus the taxation of the monetary returns from property creates distortions. The nature of the distortions depends upon the presence or absence of corresponding deductions that may offset the non-taxation of liquidity.

To be concrete, consider the example presented in the introduction wherein an investor could either (1) hold money in cash, receive no interest on the money, and pay a cheap price for consumption because of the liquidity of cash or (2) hold a savings account, receive 2% interest, and pay a higher price by 2% to pay by check because savings accounts are less liquid assets for purchasing consumption.²⁸ In this case, the 2% interest on savings is subject to income taxation, but the higher price does not enjoy a deduction. If the taxpayer could deduct the higher price, then there would be no distortion caused by income taxes. Taxpayers who put money in savings would have more income but correspondingly more deductions. As a result, the distortions caused by the non-taxation of imputed income from liquidity also depend upon the non-deductibility of costs that are imposed by holding less liquid assets.²⁹

²⁷ See 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).

²⁹ Non taxability of non-interest income from assets also removes distortions caused by non taxation of liquidity. Consider the choice between holding assets in non-interest bearing checking accounts versus cash. Non-interest bearing checking accounts are less liquid assets. Purchasing commodities with a check entails higher transaction costs (in many cases) than cash. The check must be cleared and money must be moved from account to account. In the United States, however, many of these transaction services are provided by banks “free of charge”. In other words, the bank provides a return to depositors of assets in checking, but the return is in the form of banking services rather than interest. Return on assets in checking accounts in the form of banking services goes untaxed. As a result, the transaction services return to both cash and checking is untaxed, minimizing the distortion between holding one asset versus the other. Distortions persist, however, between these assets and other assets that yield a positive interest return. Thus, “free checking” constitutes a hitherto unanalyzed form of capital income that should potentially taxed.

A. Distortions to Asset Prices from the Non-Taxation of Liquidity

Before presenting an example of illiquidity premiums and the effect of taxation on the size of the premium, a few preliminaries should be emphasized.

1. Forms of Illiquidity

The example below presents the costs of illiquidity in the form of a capital loss incurred by individual taxpayers when selling an asset quickly due to a sudden liquidity need. This is not the only form of liquidity cost. An alternative (and simpler) explication like the one above presents the costs of illiquidity in the form of cheaper prices for payment with the liquid asset rather than the illiquid asset. Still another alternative explication solves liquidity shocks through non-tax-deductible personal borrowing,³⁰ such as financing consumption via credit cards.³¹ The examples below treat the costs of illiquidity as capital losses rather than higher prices because the loss and risk setting facilitates the analysis of the impacts of various tax regimes on the price and quantity of liquid versus illiquid assets. Because capital losses associated with illiquidity enjoy some tax advantages that may not accrue to other costs of illiquidity—unlike credit card borrowing or higher prices for consumption, losses can be used to reduce tax liability in some contexts-- the loss context if anything understates the degree to which liquid assets are favored by the tax code relative to illiquid assets.

In addition, the example presented in this section (and the remainder of the paper) focuses on taxation of individual taxpayers rather than corporations. In many corporate tax contexts the costs associated with illiquidity are fully deductible for corporations. For example, a corporation in the example above with money in savings account that pays a higher price by check will be able to deduct the higher price from profits, meaning that non taxation of liquidity causes less distortion in the corporate context than in the individual taxpayer context.

There are contexts, however, where the non-taxation of liquidity offers tax advantages to a corporation. For a corporation, holding liquidity and foregoing yield is akin to purchasing a “real option”. The price of the option is the foregone yield, and the option will be exercised if an investment opportunity arises for which the liquidity can be used. This imputed option value of liquidity is untaxed, however, and future taxation of the profits associated with the option’s upside enjoys the benefits of time deferral.

This “real options” tax advantage, however, is complicated and is imperfectly analogous to the non-taxation of liquidity emphasized in this paper. As a result, it is best examined in a different setting.

³⁰ See, e.g., 26 U.S.C. 163(h).

³¹ 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).

Finally, income from assets will be treated as if it is taxed upon receipt.³² In other words, the realization requirement for capital gains on assets will be ignored. Because the realization requirement lowers the tax burden on income in the form of capital gain, this assumption will overstate the impact of taxation on illiquidity premiums. The last section of the Article examines how the introduction of the realization requirement alters the conclusions reached in this analysis.

2. The Example

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.³³ Investors want to maximize return, 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 asset for whatever amount they can. Delaying asset sales in the event of a liquidity shock is not an option.³⁴

Assume that there is a perfectly liquid asset (Asset L) that is also riskless, yielding \$1 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 a checking account. Consumption can be accessed with Asset L at any time, but the asset earns no interest.

Assume further that there is also an illiquid asset (Asset IL). Asset IL is riskless; after one year has passed the asset returns \$R in all circumstances. If an individual tries to sell Asset IL suddenly, they will get a “fire sale” price of $\delta < 1$. Asset IL resembles a one year CD with a high withdrawal penalty or, more generally, any asset that is costly to sell rapidly because there are few buyers or sellers (examples include a 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.³⁵ (The relative price between Assets L and IL will be determined by the return R yielded by asset IL.)

If Asset L returns one dollar, then Asset IL must return more than one dollar. Asset IL either locks up an investor’s funds for one year or requires the investor to experience a significant loss to sell the asset. If the investor finds herself needing liquidity during that year, Asset IL must be sold in a fire sale. As a result, if Asset IL returned a dollar in one year, then an investor would choose Asset L because Asset L would earn the same return but also provide access to potentially needed liquidity. The investor therefore demands an illiquidity premium from Asset IL. The size

³² The example also assumes that there is one income tax rate, rather than many.

³³ This assumption is made for simplicity. The example can easily be altered to allow for a positive discount rate.

³⁴ In this example, assume that future consumption has no value in the event of an immediate liquidity shock.

³⁵ 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.

of the illiquidity premium depends upon the investor's anticipated demand for liquidity. The greater the chance that the investor will need access to funds during the year, the greater the illiquidity premium. The size of the illiquidity premium also depends upon the value of liquidity when the investor needs liquidity. If an unmet need for liquidity has relatively low consequences, then the illiquidity premium will be smaller.

In a world without income taxes, relatively standard liquidity preferences, and a 50% chance of needing liquidity,—Asset IL's expected return (the illiquidity premium) is 2.5% (see Table 1).³⁶ (Asset IL returns \$1.25 to the investor when there is no liquidity shock (a return of 25%) and \$.8 (for a loss of 20%) if Asset IL needs to be sold at the fire sale price.)³⁷ If Asset IL's average return is greater than 2.5% , then the investor will buy it, increasing demand until the return reduces to 2.5%. If Asset IL's return is less than 2.5%, then the investor shuns it, preferring Asset L. At a return for IL of 2.5%, however, the investor is indifferent between the two assets.

An alternative means of understanding this example is to assume that in the event of a liquidity shock, the investor cannot sell the asset (it would sell for zero) but has access to expensive loans, such as credit card loans. These loans are so expensive that if the investor holds IL and faces a liquidity shock, she experiences a negative net return of δ .

3. Liquidity Price Effects of An Income Tax With No Loss Offsets

Now suppose that an income tax of 40% is introduced into this example. Holders of Asset L are unaffected by the change. They have no income and therefore pay no taxes. The impact on holders of IL, by contrast, depends upon several aspects of the income tax.

First, consider the impacts of an income tax with no deductions or offsets for losses. The current income tax includes several features that give this assumption some practical relevance.

³⁶ The numbers used in the text can be derived from the following conditions. Consider the following conditions. The individual's utility function is given by $u(c) = \ln(c)$ (a common specification that likely understates the liquidity premium because it understates the degree of curvature in the utility function and hence the degree to which liquidity is valuable). There is probability π that the individual will need to sell their asset suddenly during the year in order to consume and probability $(1 - \pi)$ that the individual can wait for one year in order to consume. R represents the return of Asset IL relative to the return of Asset L, and therefore specifies the price of Asset IL relative to Asset L. If there is a liquidity shock and Asset IL needs to be liquidated, then it yields $\delta \in [0, 1]$. (liquidating Asset IL always entails a loss of δ . Solving for Asset IL return R to make an individual indifferent between Asset L and Asset IL in a world without taxes, implies that $\pi * u(\delta) + (1 - \pi)u(R) = \ln(1)$. If, as in the text, $\delta = .8$ and $\pi = .5$, then $R = 1.25$, implying an expected return for asset IL of $.5 * .8 + .5 * 1.25 = 1.025$. Illiquid Asset IL requires a 2.5% return if liquid Asset L requires no return.

³⁷ Alternatively, the liquidity premium could be defined as the premium for holding an illiquid asset to maturity rather than holding the liquid asset for the same extended period. Under this definition, the liquidity premium is 29%.

Investment losses cannot simply be deducted to reduce income taxes. Sections 1211 and 1212 of the Code, for example, limit the ability to take deductions from capital losses to the amount of capital gains enjoyed by a taxpayer plus \$3000.³⁸ Capital losses in excess of this amount may be “carried forward” or “carried back” to be used as offsets to gain incurred in prior or future years.³⁹ If the losses must be 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. As a result, the Federal Income Tax code contains asymmetries that create the real possibility of taxable gains without losses that provide tax benefits to the taxpayer.

Alternatively, one can understand the relevance of a “no loss offsets” (or even a tax penalty for losses) example by assuming that an investor holding IL who experiences a liquidity shock borrows at expensive rates that are non-deductible. Acquiring liquidity via credit card fits this description. In this case, the investor experiences a negative net return on their gross investments. This negative return is made even lower by the fact that the positive returns on Asset IL will ultimately be taxed.

When income from financial assets is taxed at 40% but losses go untaxed, the desirability of illiquid assets such as IL which pay returns that are subject to taxation goes down. Holders of Asset IL must pay $.4 * \$.25 = \$.10$ in income tax, while holders of Asset L owe no tax. This tax reduces the net return of IL to a negative return.⁴⁰ At this price, no one will hold Asset IL. In response, the average return for IL must rise to make investors again indifferent between Assets IL and L. If IL delivers a pretax average return of 10.8%, then investors will again be indifferent between Assets L and IL.

The introduction of an income tax with no loss offsets therefore makes liquid assets (such as Asset L) more attractive relative to illiquid assets such as IL. The illiquidity premium—the yield taxpayers will forego in order to hold the liquid asset, therefore rises in the presence of an income tax with no loss offsets. The price of illiquid assets falls with respect to the price on liquid assets. Although the size of the price shift may be exaggerated by the assumption of zero loss offsets, any limitation on loss offsets, such as that contained in Section 1211, requires that the premium associated with illiquidity must rise in the presence of income taxes.

4. Liquidity Price Effects of an Income Tax With Full Loss Offsets that Accrue at the End of the Taxable Year

Now consider what happens if there is a loss offset, but the loss offset does not benefit the taxpayer until the end of the year. That is, if the taxpayer sells an asset for a loss during a liquidity shock, the government does not provide the taxpayer with an immediate check that

³⁸ 26 U.S.C. Sec. 1211.

³⁹ 26 U.S.C 1212.

⁴⁰ The pre tax return remains a positive 3.2%, but the tax asymmetry reduces the expected net return below zero.

corresponds to the value of the loss offset. Instead, the value of the loss offset is only realized after the liquidity event, when the taxpayer computes her total taxes. This hypothetical income tax system is, if anything, more favorable to illiquid assets than the actual income tax, which has greater restrictions on loss offsets (see above) and certainly does not require the government to send a check to the taxpayer each time the taxpayer suffers a loss on an asset.

Because losses are only offsets against gains at the end of the year, the “cash value” of tax refunds due to losses is not received the instant the loss is recognized. Instead, the tax value of the loss is enjoyed when tallying up gains and losses in order to determine a total year’s income. As a result, the “insurance” provided by income taxes on risky asset returns⁴¹ does not constitute liquidity insurance—the tax value of a loss does not provide liquidity the moment it is needed. If capital markets functioned perfectly, then the taxpayer could borrow against the tax rebate she will receive as a result of her losses. But if capital markets were perfect, the taxpayer would not have had to sell her asset at a fire sale price in response to a liquidity shock, so the possibility of borrowing against future income to meet a need for liquidity is an unrealistic one in this context.

In the example examined in this section, the introduction of an income tax with delayed tax benefits for losses on assets raises the illiquidity premium for Asset IL over Asset L to the same degree as it did when the income tax did not offer any loss offsets. Asset IL must again offer a pre-tax gross return of 9.6% in order to induce an investor to hold IL rather than L, a much higher illiquidity premium than the 3.2% that existed without income taxes. The illiquidity premium increases relative to no income taxes because there is income tax on the positive expected return offered by Asset IL. The illiquidity premium increases to the same degree as if there were no tax loss offsets because, in the example, the only consumption that matters in the event of liquidity shocks is immediate consumption. Future consumption, such as that provided by a future income tax refund, has no value in the simplified model of liquidity shocks prevented here.

This is only partly realistic. While an individual facing a liquidity shock undoubtedly places a high discount on future consumption,⁴² other consumption presumably retains some value.⁴³ Thus, the illiquidity premium for a income tax with end of year loss offsets is likely to be

⁴¹ When an income tax has full loss offsets, the income tax provides risk insurance for risky asset returns because the government shares in the upside risk by imposing income taxes on positive asset returns and the government shares in the downside risk by providing tax loss offsets in the event of negative returns. As the text indicates, however, this risk insurance is not equivalent to liquidity insurance because the timing of the tax payments does not assist in the event of a liquidity shock. As a result, the Domar-Musgrave result for risk sharing does not apply to liquidity taxation. For more on this issue, see the next section.

⁴² If the individual did not discount future consumption relative to current liquidity needs, they would not be selling

⁴³ Even if future consumption has no value, the taxpayer may be able to sell the value of the offsets at the same discount, δ at which she can sell Asset IL. Selling loss offsets, however, is restricted by the income tax code. See, e.g., Mark Campisano & Roberta Romano, *Recouping Losses: The Case for Full Loss Offsets*, 76 *Nw. U. L. REV.* 709 (1981) (critiquing limitations on offsets).

lower than the illiquidity premium when there are no loss offsets because the expected value of tax payments are lower in this context.

In spite of this qualification, the introduction of an income tax with loss offsets that accrue at the end of the year increases the illiquidity premium relative to the absence of an income tax. Because Asset IL has a positive expected return, income taxes fall more heavily on IL than on L, even with loss offsets. Moreover, the tax loss offset does not provide liquidity insurance because it does not provide cash when it is most needed. As a result, the liquidity premium increases in the presence of an income tax with full loss offsets that are turned into cash at year's end.

5. Liquidity Price Effects of an Income Tax With Full Loss Offsets that Accrue Immediately

Now assume that the government introduces an income tax with full loss offsets that accrue immediately. If an investor experiences a liquidity shock, she sells Asset IL at the fire sale price. Selling at a loss entitles the investor to tax benefits. In this subsection, assume that the government sends a check for the value of the tax benefits immediately. This is very valuable to the investor because it provides additional liquidity at a time when the investor has great needs for these funds. The government is therefore providing a form of liquidity insurance, providing liquidity to individuals when they most need it.

In reality, of course, the income tax does not function as liquidity insurance. The tax value of losses is limited (Section 2) and also is enjoyed at the end of the tax year rather than at the time a loss is incurred. Nevertheless, this section explores these unrealistic assumptions to see if there are conditions under which liquidity premia do not increase in the face of income taxes.

When asset quantities are fixed, the assumptions used in this example imply that the illiquidity premium *decreases* when an income tax is introduced. In the no income tax context, Asset IL required a premium of greater than 3% because it provided little consumption in the face of a liquidity shock when consumption was particularly valuable. An income tax with full loss offsets mitigates this characteristic of Asset IL, driving the illiquidity premium down to approximately 2%. While Asset IL still sells at a fire sale price, the instant income tax refunds associated with the sale diminishes the liquidity problem for the investor. Although Asset IL is still associated with a greater average income tax burden than Asset L because of IL's positive expected return, the value of liquidity insurance via the income tax code (under the assumptions offered here) is so great that the illiquidity premium goes down when an income tax is introduced.⁴⁴

Too much should not be made of this result. As mentioned, tax losses have limited deductibility. In addition, the tax value of losses is only enjoyed at the end of the tax year, and not at the time that the investor most needs liquidity. Finally, this section treated all costs of liquidity

⁴⁴ The reader may wonder at this point about the possibility of a Domar-Musgrave type result where illiquidity premia are untaxed. For more discussion, see Part III.C.

as losses eligible for tax offsets. In reality, many costs associated with illiquid assets, such as an added fee for paying by check or credit card, are not considered as losses for tax purposes. For all of these reasons, it is considerably more likely that the income tax code burdens illiquid assets, which have high taxable returns, more heavily than liquid assets, which have imputed liquidity services returns that are not deductible. This section, however, demonstrated that the relative size of the burden depends upon the tax treatment of the costs and losses associated with illiquidity.

Table 1

Table 1 : Price Distortion Introduced by Income Taxation of Return But Not Liquidity								
	Income Tax =0%		Income Tax=40%, No Loss Offsets		Income Tax=40%, Loss Offsets at End of Taxable Year		Income Tax=40%, Loss Offsets Turned Into Cash Immediately	
Asset	Pre-tax Return	Post-Tax Return	Pre-tax Return	Post-Tax Return	Pre-tax Return	Post-Tax Return	Pre-tax Return	Post-Tax Return
IL (Illiquid)	2.5%	2.5%	10.8%	2.5%	10.8%	6.5%	2.3%	0.9%
L (Liquid)	0%	0%	0%	0%	0%	0%	0%	0%

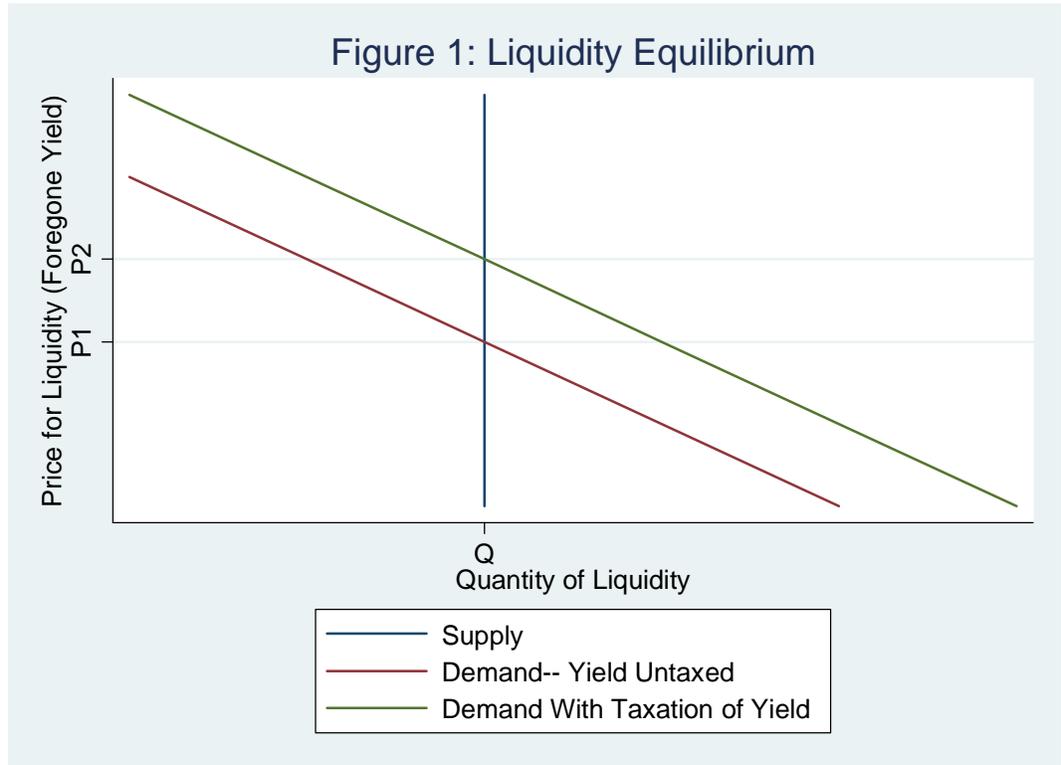
B. The Supply and Demand of Liquid Assets

1. Fixed Liquidity Supply

The effect of taxation of return and non-taxation of liquidity can also be represented graphically. Figure 1 sketches the supply and demand for liquidity in the economy. The “price” of liquidity (Y-axis) is the return that an investor foregoes in order to attain more liquidity. The quantity of liquidity (X-axis) can be thought of as the percentage of assets in the economy that can be liquidated for a reasonable price. The demand for liquidity is downward sloping. If obtaining an asset that can be liquidated for a reasonable price requires investors to forego a lot of yield, then investors will demand relatively little liquidity. As the foregone yield (“price”) of liquidity goes down, investors will demand more such assets. In Figure 1, the supply of liquidity

is vertical. The liquidity of assets is fixed exogenously and does not respond to the price of liquidity. In terms of the example of the previous section, Assets L and IL exist in fixed supply and cannot be transformed into one another.

Prices are determined by the intersection of the supply and demand for liquidity. Without income taxes, the market for liquidity is in equilibrium when supply is at Q and the price is at $P1$. At $P1$, investors demand for liquidity is equal to the supply of liquidity in the market.



Now consider what occurs if an income tax is introduced. The examples from the previous subsection indicate that the demand curve for liquidity shifts up under most reasonable characterizations of an income tax. Why do the demand curves for liquidity shift up? As the examples demonstrate, yield is taxed, so foregoing more yield is less problematic for an investor—they do not get to keep all of the yield in any case. By contrast, the costs of illiquidity—the need to sell the illiquid asset at a fire sale price in the case of a liquidity shock—have limited deductibility and value; losses are treated asymmetrically with gains and the value of loss offsets does not accrue at the same time as the liquidity shock. Thus, the introduction of an income tax that resembles the income tax code experienced in the United States shifts the liquidity demand curve upward.⁴⁵

⁴⁵ If income taxes function as liquidity insurance, with tax losses immediately accompanied by a government check (Section III.A.5), then the liquidity demand curves shifts down rather than up in the presence of a tax. Under these conditions, the investor pays a positive expected income tax, but the liquidity insurance value of the

Figure 1 demonstrates that income taxation changes the relative prices of liquid versus illiquid assets. The pretax illiquidity premium rises when income taxes rise. A rise in income tax rates reduces the after tax return that compensates for illiquidity but does not change (or makes a smaller change) to the after-tax return.

When the supply of liquidity in the economy is fixed (perfectly inelastic), the change in relative prices is the only distortion caused by the model. The amount of liquidity or type of assets held by an investor do not change, because the supply of both assets is fixed. As a result, there is no distortion in the types of assets in the economy, just a change in prices.

This model provides some insight about the short term effects of a change in income taxes on the relative price of illiquid assets. In the short term, the supply of assets in the economy is at least somewhat inelastic to price. As a result, a rise in income taxes should lead to a short term increase in the illiquidity premium, while a fall in taxes should lead to a fall in the illiquidity premium.⁴⁶

2. Upward Sloping Liquidity Supply

While the previous discussion assumed that the liquidity of an asset is fixed, this assumption was unrealistic. The liquidity of assets available for purchase is not exogenously determined. Instead, liquidity can be produced at some cost.

There are many examples of liquidity being produced at some cost. Banks, for example, are an institution that provides liquidity for individuals while enabling long term investments, though at the cost of creating an institution (banks) that is inherently unstable.⁴⁷ Similarly, borrowers with a demand for capital can seek capital in the markets by offering various liquidity options. Short term borrowing offer 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 them more expensive. This explains why all borrowers do not issue short term debt, despite the fact that short term debt is invariably cheaper. In yet another example, hedge fund managers are willing to charge lower fees for investors willing to "lock up" funds for a longer period. The managers are willing to accept the lower fee because they believe they can earn higher returns with "patient" capital.

The illiquid assets examined in Part II provide further evidence of the cost of providing liquidity. Restricted stock is subject to lower regulatory hurdles than unrestricted stock. It also

income tax exceeds the costs of the income tax, making illiquid assets more attractive relative to liquid assets. As mentioned above, the US Income Tax code does not resemble this hypothetical tax regime.

⁴⁶ If investors anticipate that asset supply will change quickly, then the size of these effects will be reduced.

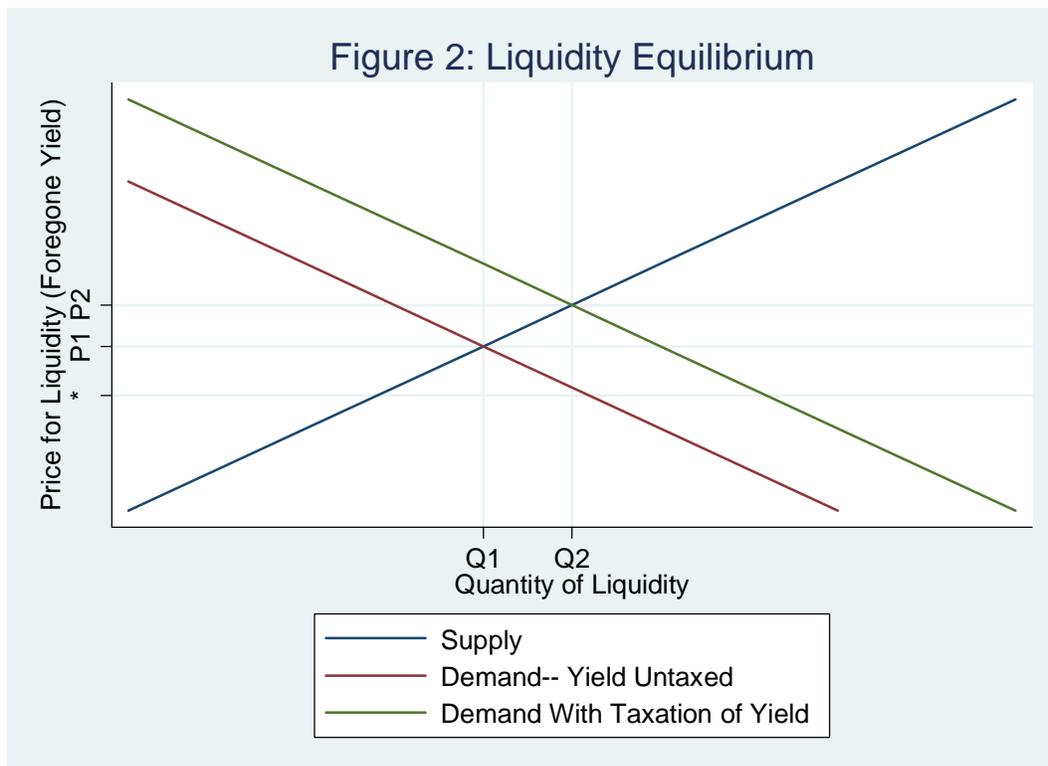
⁴⁷ See, e.g., Douglas Diamond and Phillip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 J. POL. ECON. 401 (1983). For more discussion, see Part IV.3.

enables a company to maintain direct relationships with its shareholder base. As a result, companies may issue restricted stock in spite of the fact that restricted stock trades at a discount to unrestricted stock. Similarly, open end mutual funds, which can be redeemed for cash at any time, must hold some low yielding liquid assets in order to meet redemption requests. Closed end funds, by contrast, do not face redemption risk, and so can avoid holding low yielding cash. This advantage may be sufficient to overcome the higher returns demanded by investors for closed end funds.⁴⁸

With upward sloping liquidity supply curves and tax asymmetries that cause the liquidity demand curve to shift up in the presence of taxes, liquidity is overproduced. Consider the case where illiquid assets yield 2% but require 2% higher payments and the tax on yield is 50%. In this case, no one will hold the illiquid asset in the presence of taxes. But now suppose that the illiquid asset can be transformed into the liquid asset at cost of .5%. The illiquid asset will be transformed because it costs .5% but saves 1% in taxes. From a social perspective, the transformation from the illiquid to liquid asset is a waste. Both assets provide the same consumption benefit from a pre-tax perspective. The higher cost of consumption from the illiquid asset is fully mitigated by the higher return available from the illiquid asset.

The overproduction of liquidity can also be demonstrated in the liquidity supply and demand diagram (Figure 2). As in Figure 1, demand for liquidity is downward sloping—investors want more liquidity when the price of liquidity (in terms of foregone yield) is cheaper. In addition, the demand for liquidity shifts up when a tax on yield is introduced because the costs of illiquidity are incompletely deductible—investors are willing to forego more pretax yield for a given amount of liquidity when some of the foregone yield goes to the government rather than investors. Unlike Figure 1, the supply of liquidity in Figure 2 is upward sloping. The curve is upward sloping for the reasons mentioned above. While it may be easy for firm seeking investors to allow a small number of investors to withdraw their capital at will, the firm will become increasingly unstable as it sells an increasing amount of very liquid capital. Alternatively, becoming a publicly traded firm greatly increases liquidity, but at considerable cost in the form of securities regulation, stock exchange requirements and public spotlight. While some firms may find it easy to meet these requirements, others will find them more onerous and will only undertake them if the yields they must offer to investors go down considerably.

⁴⁸ This is not true, however, for initial purchasers of closed end funds, who get liquid asset type returns for illiquid assets.

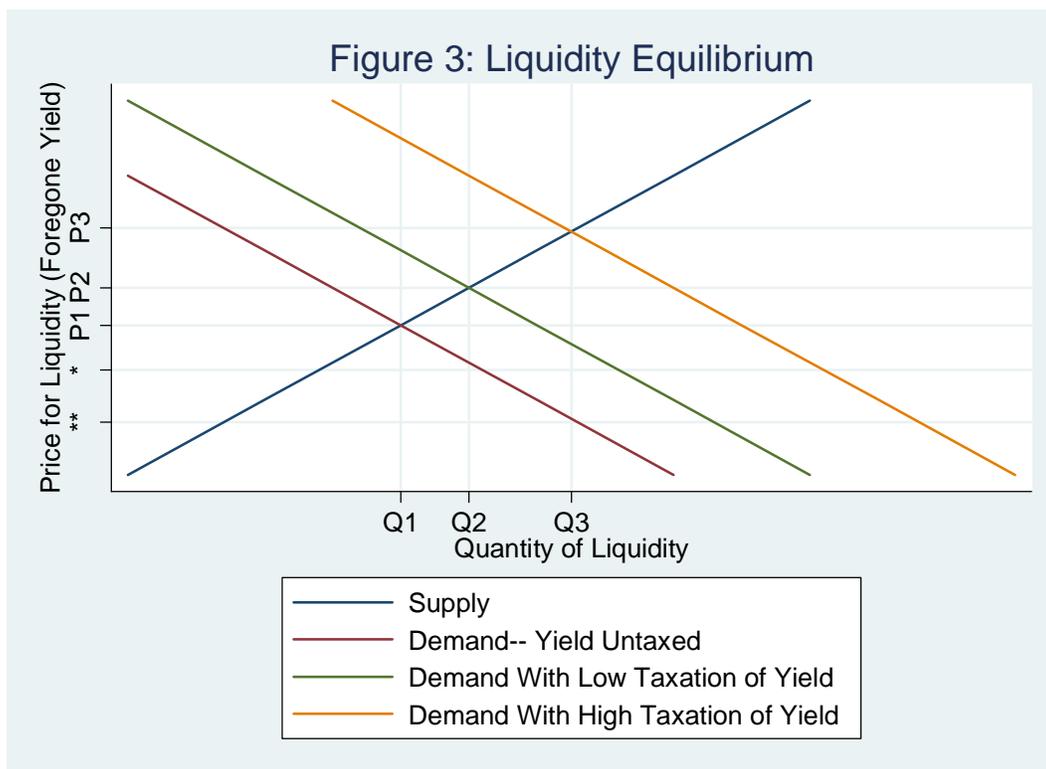


With an upward sloping liquidity supply curve, the effects of the introduction of a tax on yield but not liquidity changes both the price of liquidity and the amount of liquidity supplied. When investors are willing to forego more yield due to income tax on the yield, the price of liquidity rises from P_1 . The size of the increase in price (from P_1 to P_2) is lower than it was in Figure 1 because some of the increase in demand for liquidity is met by new supply of liquidity. When liquidity costs more than P_1 , suppliers of liquidity will produce more liquid assets. For example, with taxes, the transformation from Asset 1 to Asset 2 discussed in Table 2 becomes financially attractive, increasing the supply of liquid Asset 2. In the new equilibrium, the price of liquidity shifts from P_1 to P_2 and the quantity of liquidity shifts from Q_1 to Q_2 .

In Figure 2, there is an inefficiently high amount of liquidity produced. Each additional increment of liquidity beyond Q_1 can be produced at a cost of above P_1 , but yield social benefits of less than P_1 (the value of tax foregone is not a social benefit). Thus, all liquidity produced between Q_1 and Q_2 represents liquidity that is inefficiently produced because yield is taxed and liquidity is not. The total deadweight loss created by the introduction of the tax on yield but not liquidity can be represented by the area of the triangle, (Q_1, P_1) , $(Q_2, *)$ and (Q_2, P_2) .

The size of the deadweight loss introduced by the taxation of liquidity depends upon the effect of the introduction of income taxes on liquidity demand, as demonstrated by Figure 3. Figure 3 adds a third liquidity demand curve to the two demand curves of Figure 2. The third demand curve represents demand for liquidity when the introduction of taxes causes demand for liquid assets to shift up to a greater degree. Such a large shift may be due a particularly strong regime limiting the use of loss offsets. In this case, an income tax regime that partially limits loss offsets would be represented by the middle liquidity demand

curve, while a regime that forbids all loss offsets would create the larger outward shift in demand for liquidity. In the latter case, the new equilibrium in the market for liquidity is at the price P_3 and quantity Q_3 . With a large liquidity demand shift induced by an income tax, a lot of liquidity is produced and investors pay a high price for liquidity. The inefficiency produced in this case is much larger than the inefficiency introduced by an income tax that has more muted effects on liquidity demand. Instead of the deadweight loss being area of the triangle (Q_1, P_1) , $(Q_2, *)$ and (Q_2, P_2) , the deadweight loss is now the much larger area of the triangle bounded by (Q_1, P_1) , $(Q_3, **)$ and (Q_3, P_3) . When liquidity demand shifts greatly in response to income taxes, some liquidity is produced that is much less valuable than the yield producing such liquidity foregoes. The liquidity is provided anyway, because the high tax on yield makes it worth the tradeoff for both the supplier and investor, if not for society as a whole.



The example provided in Table 2 and the supply and demand analysis of Figure 2 and Figure 3 demonstrated that when asset liquidity can be supplied at a cost, a tax on yield but not on liquidity raises the price of liquidity and causes liquidity to be inefficiently overproduced. The economy will have too many low-yielding high-liquidity assets. The next section applies this insight to two financial sectors—securitizations and the decision to go public or remain private.

C. Liquidity Supply and Demand When Tax Asymmetries do not Cause the Liquidity Demand Curve to Shift Upward (Domar Musgrave for Illiquidity Premium)

Part III.A examined how alternative formulations of the tax code were associated with different tax impacts on the demand for liquid relative to illiquid assets. While the income tax

code likely taxes higher yields associated with illiquidity without mitigating illiquidity—therefore raising demand for liquid versus illiquid assets—this is not always the case. For example, if the income tax code provides liquidity insurance—mitigating the pain of a liquidity shock by providing immediate cash to offset a liquidity-induced loss—the value of the liquidity insurance on illiquid assets may exceed the higher expected income taxes on the illiquid assets, shifting liquidity demand inward.

The efficiency implications of this shift inward shift in demand for liquidity depend upon the particular characteristics of supply and demand in the market for liquidity. At first glance, there seems to be an illiquidity analogue to the Domar-Musgrave result with respect to risk. If the government provides liquidity insurance through the tax code, then investors may seek to undo the insurance and grab more yield by buying more of the high yield/illiquid asset, just as the reduction in risk caused by income taxes causes investors to shift to higher risky asset holdings in the Domar Musgrave framework.

The mere existence of an illiquidity premium, however, implies that investors are not able to undo a tax on the illiquidity premium as they can undo a tax on the risk premium in Domar Musgrave. Domar Musgrave depends on individuals being able to costlessly finance the shift in portfolio towards risky assets. But if costless finance is available, then an illiquidity premium should not exist. With financing available, an investor holding an illiquid asset who is subject to a liquidity shock will simply acquire liquidity via borrowing and forego selling the illiquid asset at a fire sale price. The advantage of a liquid asset that justifies a lower return—its ability to be converted cheaply into consumption in the presence of a liquidity shock—is eliminated when financing is available. The existence of the illiquidity premium therefore implies limits on the ability of investors to finance portfolio shifts to undo the impacts of taxation of illiquidity premiums.⁴⁹

Without the ability to undo taxation of illiquidity premiums, any shift in demand for liquid versus illiquid assets implies the existence of a deadweight loss. If the income tax is structured to provide instant liquidity insurance, then the deadweight loss caused by the introduction of the tax will be different than the deadweight loss examined previously. There will be an inefficiently high amount of illiquidity rather than an inefficiently high amount of liquidity.

Of course, the conditions whereby the demand for liquidity shifts inward as a result of an income tax are unlikely to be met by most income tax systems. Income taxes do not truly provide liquidity insurance. The losses that occur from selling assets at fire sale prices are not fully deductible under the income tax, nor are the tax loss offsets that do exist accessible the instant the loss occurs (when liquidity is most needed). As argued above, it is more likely that income taxes cause demand for liquidity to shift outward then to shift inwards.

⁴⁹ Cunningham demonstrates that the Domar Musgrave result does not apply in the risk context when there are borrowing constraints. See Noël B. Cunningham, *The Taxation of Capital Income and the Choice of Tax Base*, 52 TAX L. REV. 17, 44 (1996).

IV. Inefficiencies Caused By the Taxation of Risk and the Non-Taxation 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, 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.

1. Securitization

Securitization is “the process of taking an illiquid asset, or group of assets, and through financial engineering, transforming them into a security.”⁵⁰ Securitization is associated with benefits and costs.

a) The Benefits of Securitization

Consider the description of the contrast between the pre-securitization mortgage market and the securitized mortgage market offered by Michael Lewis in his bestselling *Liar’s Poker*.⁵¹

Mortgages were not tradable pieces of papers; they were not bonds. They were loans made by savings banks that were never supposed to leave the savings banks. A single home mortgage was a messy investment for Wall Street, which was used to dealing in bigger number. No [Wall Street] trader or investor wanted to poke around suburbs to find out whether the homeowner to whom he had just lent money was creditworthy. For the home mortgage to become a bond, it had to be depersonalized.

At the very least, a mortgage had to be pooled with other mortgages of other homeowners. Traders and investors would trust statistics and buy into a pool of several thousand mortgage loans made by a [bank], of which, by the laws of probability, only a small fractions should default. Pieces of paper could be issued that entitled the bearer to a pro rate share of the cash flows from the pool, a guaranteed slice of a fixed pie....

Thus standardized, the pieces of paper could be sold to ... anyone with money to invest. Thus standardized, the pieces of paper could be traded.”⁵²

⁵⁰ Investopedia, at <http://www.investopedia.com/ask/answers/07/securitization.asp>, last visited April 20, 2010.

⁵¹ MICHAEL LEWIS, *LIAR’S POKER: RISING THROUGH THE WRECKAGE OF WALL STREET* (1989).

⁵² Lewis, *supra* note 51, at 85.

This description of securitization highlights its primary benefit—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 could be sold to anyone with money to invest. Any investor holding securitized mortgages can sell them quickly and cheaply to other investors should an unanticipated liquidity need arise.”⁵³

Financial theory predicts that this enhanced liquidity lowers the yield that mortgages and mortgage bonds must yield. A bank considering making a mortgage loan now 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 investments, thereby lowered the return demanded by investors for a given loan.

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 idiosyncratic risks unique to 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 who issued securitized home mortgage bonds that benefited from implicit government guarantees. These guarantees further encouraged the development of securitization in the mortgage area.⁵⁴

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.⁵⁵ [Get Cite].

⁵³ While this description focuses on the liquidity benefits of securitization in the mortgage market, securitization offers liquidity benefits for almost any time of financial asset, such as intellectual property. 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., Christopher L. Peterson, *Predatory Structured Finance*, 28 CARDOZO L. REV. 2185, 2207 (2007); Sam Adler, *David Bowie \$55 Million Haul: Using a Musician's Assets to Structure a Bond Offering*, 13 ENT. L. & FIN. 1 (1997). 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.

⁵⁴ See Peterson, *supra* note 53, at 2198-2199.

⁵⁵ See Robert DeYoung & Tara Rice, *How Do Banks Make Money? The Fallacies of Fee Income*, ECON. PERSP., 4th Q. 2004, at 34.

In addition to these administrative costs, securitization engenders 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 their mortgage loans.⁵⁶

These moral hazard problems proved to be extremely important during the financial crisis of 2007-2009. Descriptions of the 2002-2007 housing bubble and crash are replete with descriptions of this moral hazard problem in action, as mortgage originators lent freely, paying little attention to credit quality. Ironically, during the financial crisis of 2007-2009, 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.⁵⁷

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 yield nor liquidity is taxed, then securitizations should occur whenever their liquidity benefits (in terms of foregone yield) meet or exceed the costs of creating the securitized asset. When yield is taxed but liquidity is untaxed (and the costs of illiquidity are non-deductible), some assets will be securitized even when the costs of the securitization exceed the benefits, creating an inefficiently large amount of securitization. (See Table 2 and Figure 2).

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 lower 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 either non-deductible or deductible at a low value time frame, there may be a significant amount of such inefficient securitization due to the tax wedge between yield and liquidity. 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

⁵⁶ See, e.g., Karl S. Okamoto, *After the Bailout: Regulating Systemic Moral Hazard*, 57 UCLA L. REV. 183 (2009).

⁵⁷ 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).

role in setting the conditions for the crisis.⁵⁸ Regulation of securitizations, which is a critical part of many financial reform proposals, do not address the probable tax subsidy for liquidity and may therefore not provide a comprehensive solution to the problems of oversecuritization.

2. 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 an exhaustive list of regulations from securities regulators and stock exchanges and the principal agent problems introduced by having a diffuse shareholder base. The taxation of 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.

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. [FN168] 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. [FN169] 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.⁵⁹

Indeed, this enhanced liquidity—and the resulting reduction in the cost of capital—is considered the primary benefit of becoming a publicly traded company rather than remaining privately traded or becoming an intermediate entity, such as a company traded on a Rule 144A exchange.⁶⁰

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.⁶¹

⁵⁸ Note that 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.

⁵⁹ William K. Sjostrom, Jr., *The Birth of Rule 144A Equity Offerings*, 56 UCLA L. REV. 409, 432-33 (2008).

⁶⁰ Sjostrom, *Id* at 432-37.

⁶¹ See MARK GRINBLATT & SHERIDAN TITMAN, *FINANCIAL MARKETS AND CORPORATE STRATEGY* 79-80 (2nd ed. 2002).

The liquidity via public trading demanded by investors depends upon the price of that liquidity in terms of foregone yield. The lower this price, the more liquidity via public trading will be demanded. Thus, the demand curve for liquidity via public trading will be downward sloping (See Figures 2 and 3).

b) Costs of Becoming a Publicly Traded Company

In order to become a publicly traded company, public issuers must incur a number of fees. For example, underwriters commonly charge 7% of gross proceeds in order to bring a company public.⁶² The total direct cost of taking a company public is 11% of proceeds.⁶³ 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.⁶⁴ A 2007 study estimated that the average annual cost of being public for companies with annual revenue under \$1 billion was approximately \$2.8m.⁶⁵ These direct costs do not include the 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 will have idiosyncrasies (e.g. management comfortable with public scrutiny) that make it relatively cheap for them to go public, while other companies will have features (e.g., a secretive business plan), that make going public more expensive. As a result, there will be more liquidity provision via going public when the price of liquidity is high than when the price of liquidity is low (an upward sloping liquidity supply curve as in Figures 2 and 3).

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."⁶⁶ The differential tax treatment of the benefits and costs of going public, however, create incentives for some firms to go public when the benefits of doing so fall short of the costs.

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 P1 and P2 and that, without tax, going public yields liquidity benefits to investors in Company A of below P1. In a world without

⁶² See Husuan-Chi Chen and Jay R. Ritter, *The Seven Percent Solution*, 55 J. FIN. 1105 (2000).

⁶³ See GRINBLATT & TITMAN, *supra* note 61 at 80.

⁶⁴ See, e.g., Roberta Romano, *Sarbanes-Oxley and the Making of Quack Corporate Governance*, 114 YALE L.J. 1521 (2005).

⁶⁵ See Foley and Lardner, LLP, *The Cost of Being Public in the Era of Sarbanes Oxley* at 2, available at http://www.foley.com/files/tbl_s31Publications/FileUpload137/3736/Foley2007SOXstudy.pdf (last visited April 21, 2010).

⁶⁶ GRINBLAT AND TITMAN, *supra* note 61, at 80.

an income tax, Company A would not go public. If the extra yield that the company pays as a result of not being public is taxable while the costs of this illiquidity to investors are non-taxable, then the benefit of public trading to investors rises to above P2. 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 yield and non-taxation of liquidity (and non-deductibility of the costs of liquidity) may therefore lead to considerable efficiency losses through the overproduction of liquid publicly traded companies.

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

Securitized and initial public offerings share a salient feature. In both 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 tax preferred status, then the financial industry assumes a larger size. As a result, the tax wedge between yield and liquidity engenders a large financial sector.

The upward sloping liquidity supply curve described above defines much of the financial industry. At a cost, financial professionals “make markets” and thereby create liquidity where they 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.⁶⁷ 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 deposited 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 that borrowed from the bank (e.g. 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 intermediary and the bank’s employees may not be as careful making loans with Person A’s money as Person A would be.

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

⁶⁷ 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).

This Part of the Article discussed distortions to the price and quantity of liquidity caused by taxation of yield but not liquidity. The next Part of the Article turns to another inefficiency created by the taxation of yield but not liquidity. If different investors are subject to different tax rates, then investors may hold liquid and illiquid assets on the basis of their tax status rather than on the basis of their need for liquidity.

V. Clientele Effects and the Non-Taxation of Liquidity

Investors face a wide variety of tax rates. “Tax clienteles” arise when investors with different rates choose to hold different assets.⁶⁸ One common clientele effect occurs in the tax exempt mutual bond market. Higher bracket tax payers are willing to pay more for tax exempt bonds than low bracket tax payers, 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.

The taxation of yield and the non-taxation of liquidity create tax clientele effects in asset holdings. High bracket taxpayers will hold assets that offer high amounts of untaxed liquidity, even if the high bracket taxpayers need for liquidity is low.

A. Inefficient Allocations of Liquidity Because of Tax Clienteles

Let us return to the example presented in Table 1. There are two assets, one liquid the other illiquid. Illiquid Asset 1 cannot be transformed into liquid Asset L at any price. In this section, 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 described above in Tables 1. Private Sector is subject to a 40% tax rate and is willing to forego 2.5% in after tax return in order to hold perfectly liquid Asset L. The second type of investor (to be termed “Non-profit”) is not subject to any tax. Non-Profit values liquidity more than Private Sector, and is willing to forego a 5% return in order to hold liquid Asset L. Each investor type demands one Asset for its portfolio.

Without taxation of yield, Private Sector holds illiquid Asset IL and Non-Profit holds liquid Asset IL. This is because Private Sector has a higher tolerance for illiquidity than Non-Profit. Suppose that illiquid Asset IL yields slightly greater than 2.5%. At this price, Private Sector prefers Asset IL because the yield exceeds the value of liquidity to Private Sector from Asset L. Non-Profit, by contrast, prefers to hold Asset L—the 5% imputed value to Non-Profit from Asset IL’s liquidity exceeds the return offered by illiquid Asset IL.

⁶⁸ See Michael Knoll, 82 S. CAL. L. REV. 703, 767 n. 117 (2009).

Now, however, introduce a tax on yield of 40% for Private Sector, with Non-Profit remaining untaxed on yield. If the pretax yield of Asset IL remains at slightly above 2.5%, Private Sector will now prefer Asset L to Asset IL. For Private Sector, the untaxed imputed yield from liquidity of Asset L is 2.5%, while the post-tax yield from Asset IL is now under 2%. At a pre tax yield of slightly over 2.5%, there is no demand for illiquid Asset IL, which means that its yield must rise to induce either Private Sector or Non-Profit to prefer Asset IL to Asset L.

If illiquid Asset IL offers a pre-tax yield of 6%, then Non-Profit will prefer Asset IL's yield to the imputed liquidity yield of Asset L. Asset IL has total yield of 6% after tax (of zero) for Non-Profit, while Asset L has an imputed yield of 5%. A yield of 6% is not enough to induce Private Sector to prefer illiquid Asset 1, because the post tax yield of Asset 1 to Private Sector of under 2.5% remains below Private Sector's imputed yield of 2.5% from liquid Asset 2. The introduction of income taxes therefore alters the asset holdings by Private Sector and Non-Profit, with Non-Profit holding the illiquid asset and Private Sector holding the liquid Asset.

The asset allocation after the introduction of income taxes is socially inefficient. Non-profit places a higher value on liquidity than Private Sector, so Non-Profit should hold liquid Asset 1. The tax asymmetry between liquidity and yield, however, makes liquid assets more attractive to Private Sector than they would otherwise be. As a result, Private Sector holds liquid Asset 1 instead of illiquid Asset 2. 1.8% annually of value is destroyed by the tax asymmetry between yield and liquidity, where 1.8% is the value foregone by having yield loving Private Sector holding liquid Asset 2 rather than liquidity loving Non-Profit holding Asset 2.

The core prediction of this example—that 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 Non-Profit 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 Non-Profit's investments towards illiquid assets. Conversely, Private Sector's asset portfolio will be skewed towards liquidity since the preferred tax treatment of liquidity with respect to yield is most valuable for those in high tax brackets.

B. Application of Clientele Effects and Liquidity Preferences: An Alternative Explanation for the Spread of The Yale Model of Institutional Investing

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 non-profit institutions.⁶⁹ The Yale Model has been adopted at many non-profit institutions over the last 15 years.⁷⁰

⁶⁹ See Daniel Golden, *Cash Me if You Can*, CONDE NAST PORTFOLIO, March 18, 2009 (available at <http://www.portfolio.com/executives/2009/03/18/David-Swensen-and-the-Yale-Model/index.html>) (last visited on April 22, 2010).

⁷⁰ *Id.*

One of the primary features of the Yale Model is that institutions should devote much of their portfolios to illiquid assets.

[Swensen] 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.”⁷¹

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.⁷²

The response of universities with endowments following the “Yale model” partially belies the “long term investor” explanation for endowments’ disproportionate allocation to high yielding illiquid assets. Long term investors with little liquidity needs do not slash payroll expenses and capital expenditures in response to a market decline, offer to sell illiquid assets at a very low price in down capital markets, nor do they scramble to borrow money to meet payroll.⁷³ Apparently, universities do have some use for liquidity, which would have prevented many of these behaviors.⁷⁴

Clientele effects provide a complementary reason for the popularity of the Yale Model of Investment amongst university endowments. Whatever university’s liquidity needs, it is clear that, as non-profit institutions, their marginal tax rate is lower than that of most other investors. As the previous section explained, a low marginal tax rate draws low marginal tax investors to high yielding illiquid assets. The draw of illiquidity is not university’s superior patience or lack of liquidity needs, but rather the fact that the non-taxation of liquidity is less attractive for them than for the typical investor.

The yield premiums available for illiquid investments may not be attractive for patient investors with higher marginal tax rates, because the yield premia must be reduced by the marginal tax rate of the institution.

Indeed, many non-profits may have a relatively high need for liquidity. For many, an endowment is designed to shield non-profits from temporary fluctuations in revenue, providing liquidity. For institutions that use endowments as a liquidity cushion, the asymmetry between the taxation of liquidity and yield may inefficiently distort the non-profits away from liquidity. The lure of the ultra high yields

⁷¹ Id.

⁷² See AMP, *supra* note 2.

⁷³ See, e.g., Nina Munk, *Rich Harvard, Poor Harvard*, VANITY FAIR June 30, 2009.

⁷⁴ 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.

associated with illiquidity that are required to induce high tax investors to buy illiquid investments in spite of their high tax burden may be too much for non-taxable institutions to resist, even if they have greater liquidity needs than the average investor. Thus, the asymmetry between the taxation of yield and the non-taxation of liquidity encourages non-profit endowments to be insufficiently liquid, diminishing the protection endowments provide against negative shocks to their business models.

VI. Mitigating Inefficiencies Caused by The Non-Taxation of Liquidity

The previous Parts of this paper demonstrated that non-taxation of imputed income from liquidity gives rise to inefficiencies in the price and distribution of asset liquidity within an economy and the allocation of these assets to different investors. This discussion, however, failed to provide some evidence regarding the size of the market for liquidity, and therefore the importance of the distortion. The discussion also overlooked many elements of the U.S. Income Tax Code that may mitigate or exacerbate the distortions. This Part discusses the potential importance of distorted market for liquidity and examines aspects of the income tax code that may mitigate the distortion, including the realization requirement and the corporate tax. This Part also examines how proposed changes to the US taxation, such as the introduction of a consumption tax, wealth tax, or Tobin Tax, will change tax related distortions to the market for liquidity.

A. How Important is the Market for Liquidity?

The previous sections explained why the market for financial asset liquidity may be distorted by the income tax code, but failed to give a sense of the magnitude of the market, and hence the importance of the distortion. The market for liquidity is, perhaps not surprisingly, an enormous one.

Cash and checking accounts constitute 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 U.S. value of cash and checking accounts—financial assets whose only return is liquidity, totaled \$1.7 trillion in March 2010.⁷⁵ Other assets, such as savings accounts or money market accounts, provide considerable liquidity as well as a low (but non-zero) return. The aggregate value of a broader definition of liquid financial assets in the US, M2, which includes savings and money market accounts as well as cash and checking accounts, totaled over \$8.5 trillion.⁷⁶ 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

⁷⁵ See M1 figure for March 2010, in Federal Reserve Board publication H.6 Table 1, available at <http://www.federalreserve.gov/releases/h6/current/> (last visited April 27, 2010).

⁷⁶ Id.

closely held corporations or real property. The aggregate value of publicly traded securities is over \$13 trillion.⁷⁷

Thus, liquidity constitutes an important component of the return of a vast array of financial assets. As a result, the distortions to the market for liquidity identified above are important ones. The remainder of this Part examines income tax code components that may mitigate or eliminate this important distortion.

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

1. The Realization Requirement

The realization requirement, which taxes capital gains when they are realized rather than when they occur,⁷⁸ alters taxation of illiquidity premiums along a number of dimensions. By enabling investors to defer taxation until realization, the realization requirement lowers the burden on returns that take the form of capital gains. Illiquid assets, which have higher returns than liquid assets, benefit disproportionately from this effective reduction in income tax rates on financial assets. Cash or checking accounts receive no benefit from the realization requirement because they offer no return that is characterized as capital gain. Illiquid assets, by contrast, may have a considerable amount of income in the form of capital gains. (Think of an entrepreneur who starts a company and finally sells it.) Thus the realization requirement reduces the size of the tax distortion in favor of liquid assets.

In addition, illiquid assets, which have lower rates of realization than liquid assets, benefit from a longer average deferral period than liquid assets. An easily trade-able 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 a liquid asset.

The realization requirement therefore narrows the income tax code's distortion in favor of liquid assets with imputed income in the form of consumption services. In terms of Figure 3, the shift in the demand curve from liquidity caused by the introduction of taxes with a realization requirement may be from the leftmost demand curve to the central demand curve. Without a realization requirement, the same income tax would have shifted the liquidity demand curve to the rightmost demand curve. Thus, the realization requirement decreases deadweight loss in the market for liquidity.

Of course, the realization requirement's reduction of the income tax distortion in favor of liquidity comes at great cost. This Article focuses on illiquidity premiums that exist because of unavoidable market frictions that characterize some assets to a greater extent than others. The size of

⁷⁷ See <http://www.wilshire.com/Indexes/Broad/Wilshire5000/> (last visited April 27, 2010). If only 1% 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.

⁷⁸ See 26 U.S.C. 1001 et. seq..

these premiums can be large, highlighting the importance of the ability to sell an asset for an asset's value. The realization requirement, by contrast, creates an avoidable tax based form of illiquidity, commonly known as the "lock up" effect. This tax induced form of illiquidity imposes significant costs that are attested to by the impressive size of existing illiquidity premiums.

Moreover, the realization requirement's role in reducing distortions in the market for liquidity stems from its role as a transactions tax⁷⁹ and its reduction in effective income tax rates. Both of these effects can be achieved more directly through transactions taxes and reductions in the income tax rate on capital. These alternatives will be discussed 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 article now turns to similar arguments that can be made on behalf of the corporate tax.

2. Corporate Taxation

Because limited liability for non publicly 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,⁸⁰ the liquidity associated with public trading confers a tax advantage relative to the yield that must be paid for an identical private company that is less liquid. Investors holding the public company's stock pay less in 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 non taxation of liquidity inducement for companies to go public. While the liquidity associated with going public is tax-favored by comparison with yield, 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.

⁷⁹ For a discussion of the realization requirement's transactions tax features, see Daniel N. Shaviro, *An Efficiency Analysis of Realization and Recognition Rules Under the Federal Income Tax*, 48 TAX L. REV. 1, 1 (1992).

As with the realization requirement, mitigation of distortions to the market for liquidity as played out in the public/private company decision constitutes a hitherto unstated efficiency argument on behalf of corporate taxation. And again, as with the realization requirement, there are better means of mitigating the distortions to the market for liquidity than via the ad hoc format of a corporate tax.

C. The Impact of Income Tax Reform Proposals on the Tax Related Distortion to the Market for Liquidity

The most direct way to mitigate the distortion created by the non-taxation of imputed income from liquidity is to tax this imputed income directly or indirectly. Either a wealth tax or the direct imputation of income from financial assets would effectively tax liquidity while retaining a system of taxation that closely resembles the current system. From a practical perspective, wealth taxes offer a more promising approach.

1. Imputation of Income From Liquidity

Direct imputation of imputed income from liquidity associated with financial assets requires establishing a benchmark rate of return for a perfectly illiquid asset with a given risk profile. All assets with a given risk profile should then be taxed on this rate of return, regardless of their actual rate of return. If the actual rate of return falls short of the benchmark return, then income should be imputed because the foregone income represents a liquidity 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%, since 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 benefits of liquidity—the opportunity to take advantage of unexpected positive expected value investment opportunities—will be taxed in this future. Even if all the value of liquidity comes from this option, however, there should still be a positive tax on the imputed income, because the ultimate taxation of return occurs at a later period and therefore has a lower present value than taxation in the current period.⁸¹

Directly imputing income to liquid assets ends the tax advantaged status of liquidity. If liquid publicly traded stock is taxed at the same rate as otherwise identical illiquid stock, then the tax motivation for holding liquidity (see Part I supra) disappears. Investors will only hold a more liquid version of an asset if the liquid asset's true return (in terms of liquidity and yield) is greater than the yield of the purely illiquid asset.

Although direct imputation of income from liquidity resolves the tax wedge between yield and liquidity, direct imputation will be difficult to implement. Any system of direct imputation suffers from the problem of creating a benchmark rate of 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 liquidity 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.

⁸¹ See Part III.B.2 for a discussion.

Alternatively, Auerbach's "retrospective capital gains taxation" proposal,⁸² which imputes a rate of return to assets regardless of their actual yield, might be applied. Auerbach's proposal taxes assets when they are realized. The proposal ignores actual returns, and instead imputes a standardized rate of return for whatever period the asset has been held. While Auerbach's proposal was introduced to mitigate realization related distortions, its imputation procedure also mitigates distortions to the market for liquidity, so long as the definition of a capital asset is expanded appropriately.

For example, suppose retrospective capital gains taxation applied to cash. The individual acquired one dollar of cash on in year 0 and used the cash to acquire consumption two years later. The standardized rate of return is 4%. Retrospective capital gains taxation would therefore impute income of $(1 + .04)^2$ to the cashholder, even though the individual enjoyed no actual return. 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.

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

Wealth taxes reduce the distortions caused by the non-taxation of liquidity.⁸³ A wealth tax taxes all forms of income associated 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 vs. yield (with the exception of wealth effects).

To demonstrate, consider the investor with a choice between getting a 2% return in savings and paying 2% extra for consumption or holding cash with no return that enables the investor to purchase consumption for 2% less. With a wealth tax of 1%, an investor with \$1 is left with \$.99. If she holds cash, she will be able to consume \$.99. If she places the money in savings, then she will get a 2% return. When she purchases consumption, however, the \$1.01 she has in her account will purchase the equivalent of \$.99 from cash because of the extra price she pays for paying with savings. As a result, the wealth tax does not distort her choice between cash and savings accounts, while an income tax makes cash more attractive than savings (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,⁸⁴ these discussions have taken place without consideration of the role of liquidity. Thus, the benefits of wealth taxes have

⁸² Alan J. Auerbach, *Retrospective Capital Gains Taxation*, 81 AM. ECON. REV. 167 (1991).

⁸³ A wealth tax is "is the economic equivalent of a normative income tax on the risk-free return." See Deborah H. Schenk, *Saving the Income Tax With a Wealth Tax*, 53 TAX L. REV. 423, 441-42 (2000).

⁸⁴ For some arguments in favor of wealth taxes or income taxes that impute income directly from capital as methods of more efficiently taxing returns from capital, see Schenk, *supra* note 83; Edwin Kleinbard, "Rehabilitating the Business Income Tax," The Hamilton Project at the Brookings Institution p. 10 (2007) (available at http://www.brookings.edu/~media/Files/rc/papers/2007/06corporatetaxes_kleinbard/200706kleinbard.pdf, last visited April 28, 2010). For a summary of arguments against the efficacy of wealth taxation, see Bankman, *supra* note 5.

been understated. Not only do wealth taxes potentially improve the efficiency of taxation of risk, but they also reduce distortions in the pricing and consumption of asset liquidity.

A wealth tax is no panacea. As many have mentioned, wealth taxes, like all ex-ante taxes may cause liquidity problems—they tax income that is hard to transform into liquid form in order to pay taxes. Moreover, wealth taxes suffer from the difficulty of placing valuations on hard to value assets. These objections, however, are less salient in the context of resolving the tax asymmetry in favor of liquid assets. The liquid assets, such as cash, that bear a heavier burden under a wealth tax than under an income tax are, by definition, easy to liquidate. They are also easy to value.

In total, a partial wealth tax on liquid financial assets could mitigate the distortions to the market for liquidity without introducing the most daunting problems associated with a wealth tax. Alternatively, any ex ante tax that imputes standardized rather than actual rates of return, such as the retrospective capital gains tax proposal, operates like a wealth tax in eliminating the tax asymmetry in favor of liquid assets.

3. Consumption Taxes and Liquidity/Yield Distortions

Unlike income taxes, consumption taxes do not directly tax yield. As a result, it would seem that consumption taxes do not distort the market for liquidity. If yield is not taxed, then the introduction of a consumption tax should not shift the liquidity demand curve--the commodity investors exchange for foregoing liquidity—yield—has the same tax treatment as liquidity. When the value of liquidity comes from transaction services in the present period rather than the preservation of investment options, however, then even a consumption tax distorts the liquidity/return tradeoff. A consumption tax fails to tax the implicit consumption in transaction services associated with holding cash.

Again, consider the choice between holding cash and paying lower prices for consumption or holding a yield-bearing savings account and paying a higher price for consumption that equals the yield. With a consumption tax, the yield associated with the savings account is not taxed. An individual is not indifferent between holding the savings account and cash, however. Holding savings and paying more for consumption bears a higher tax burden than holding cash. The higher price for purchasing consumption via a savings account is subject to consumption tax that is not paid by someone holding cash. The introduction of a consumption tax therefore fails to cure the tax asymmetry between more liquid and less liquid assets because the consumption tax fails to tax the imputed consumption of transaction services associated with holding cash.⁸⁵

⁸⁵ I acknowledge that this stretches the meaning of the term “consumption”, though not more than the value of any implicit or imputed return from an asset or activity.

4. Transaction Taxes

“Tobin” transaction taxes “on the act of engaging in transactions such as sales and exchanges”⁸⁶ have frequently been proposed as a means of dampening sudden market movements caused by impatient capital.⁸⁷ The analysis in this paper demonstrates that such transaction taxes can also mitigate distortions in the market for liquidity. Transaction taxes offer another method of mitigating the tax wedge between yield and liquidity. Transaction taxes are taxes “on the act of engaging in transactions such as sales and exchanges.”⁸⁸ By raising the cost of transacting, transaction taxes lower the value of all assets, as the lifetime expected transaction costs must be subtracted from the expected lifetime value of the asset.

Transaction taxes do not decrease the value of all assets symmetrically. The expected total incidence of a transaction depends upon the number of transactions that an asset will be engaged in. As a result, assets that will be engaged in more transactions—liquid assets—will have a greater decrease in value from the introduction of a transactions tax than illiquid assets. For example, cash holdings change hands repeatedly, so a transactions tax imposes a high cost on cash holdings, while closely held corporations may remain in the same hands for many years. A fixed transaction tax therefore directly taxes the imputed transaction services income associated with liquidity. A transaction tax of the appropriate magnitude reduces or even eliminates the tax wedge between liquidity and return.

As with the realization requirement⁸⁹ and corporate taxation, transaction taxes are an ad hoc manner of mitigating distortions to the market for liquidity. It is difficult to know, for example, the size of the transaction tax that offsets the existing tax advantages for liquidity. Nevertheless, the existing case for transaction taxes is buttressed by the ability of a transaction tax to mitigate liquidity market distortions.

VII. Conclusion

Liquidity is a critically important imputed element of return associated with holding assets that tax scholars have mostly overlooked. Tax asymmetries between the treatment of liquidity and yield 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 non-taxation of liquidity facilitates an overly large financial sector, as demonstrated by the distortion to the market for publicly traded firms and securitizations described above. Non-taxation of liquidity also creates misallocations in the holders of

⁸⁶ See Shaviro, *supra* note 79 at 1.

⁸⁷ The recent financial crisis has revived support for a Tobin Tax on financial transactions. See, e.g., Martin Hutchinson, “The Tobin Tax: The Fix-It Plan Wall Street Hates ... But Can’t Seem to Kill,” (May 27 2010) (available at <http://moneymorning.com/2010/05/27/tobin-tax/> last visited July 1, 2010).

⁸⁸ See Shaviro, *supra* note 79 at 1.

⁸⁹ Recall that the realization requirement is, in part, a transactions tax. See Shaviro See Shaviro, *supra* note 79 .

assets. Low rate taxpayers, such as non-profit 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 the distortions to the market for liquidity. They reduce asymmetries in an ad hoc manner, however, and also introduce some other well known distortions. By contrast, wealth taxes or ex ante income taxes on imputed asset returns systematically eliminate the liquidity tax asymmetries. All assets of the same value are taxed identically, regardless of whether their payoff is primarily in the form of liquidity or yield. Alternatively, transaction taxes—which impose tax burdens proportional to transaction volume-- burden liquid asset more than illiquid assets. As a result, transaction taxes mitigate or eliminate the tax preference for liquidity. The replacement of an income tax with a consumption tax also mitigates the tax wedge between yield and liquidity. Consumption taxes alone, however, do not eliminate the tax wedge as liquid assets retain some imputed transactional service income that is untaxed. A combination of consumption taxes and transaction taxes, however, can eliminate both the tax preference for consumption over savings and the tax preference for liquid savings over illiquid savings.

This article, however, cannot come close to exhausting the implications of the benefits of liquidity for taxation. For example, liquidity and risk are often highly correlated.⁹⁰ As a result, changing the taxation of liquidity may have important ramifications for the taxation of risk. Problems such as this should be the subject of future research. The present paper hopes only to offer a first start in addressing the many issues presented by the interpretation of liquidity as imputed income from a financial asset.

⁹⁰ See, e.g., Acharya & Pedersen, *supra* note 9.