

Securities Transaction Taxes: An Overview of Costs, Benefits and Unresolved Questions

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Many major developed countries, including Germany, Japan and the United Kingdom, have some form of tax on securities transactions. The Clinton administration recently considered imposing fees of from 14¢ on transactions in futures contracts. Past budgets have considered fees of from 6¢ to 15¢.

Proponents of a securities transaction tax in the U.S. argue that it would tap into a significant source of revenues and would, in addition, act to reduce "excess" volatility in securities markets by discouraging speculative and "noise" trading. Some have argued that it would also increase investors' expected holding periods, hence encourage corporate managers to build for the long term.

Opponents argue that any benefits from such a tax would be overwhelmed by its costs. They point out that a tax on transactions would increase the cost of capital, reduce market liquidity and bring down security values. Furthermore, as the tax would change the relative costs of holding and issuing different classes of securities, it might be expected to change capital structures and investment portfolios, too. At its worst, a securities transaction tax could drive trading in some securities to overseas markets not burdened by taxation. The economic and societal distortions resulting from taxation and avoidance would likely be large.

Securities transaction taxes (or STTs) have been under discussion since at least early 1987, when newly elected House Speaker Jim Wright proposed a "stock transaction tax."¹ In recent years, some form of STT has been advocated by several prominent members of the Clinton administration, including Joseph Stiglitz, the microeconomic specialist on the Council of Economic Advisors, Lawrence Summers, Undersecretary for International Affairs at the Treasury Department, and Lloyd Bentsen, Secretary of the Treasury Department.² Such proposals have begun to receive serious consideration. For example, the 1994 Clinton budget proposal contained a fee of 14¢ for each contract bought and sold on an organized futures exchange.³ The administration estimated that this fee alone would raise \$290 million over the next five years.

Proponents of a broad-based STT argue that it would raise around \$10 billion per year in tax revenue and, as a byproduct, would reduce "excess speculation" by "throwing sand in the gears" of financial markets.

Opponents of such taxes, including National Economic Council head Robert Rubin, observe that increased transaction costs would reduce securities' values, reduce liquidity, decrease the efficiency of markets and drive trading to other countries.⁴ Opponents also observe that estimates of revenue generated from an STT are uncertain. Finally, opponents suggest that implementation problems across different types of securities markets would be substantial.

This article reviews current arguments for and against securities transaction taxes, using empirical evidence to provide a cost-benefit analysis of these taxes. It also highlights important questions to be considered before such a tax is implemented.

REGULATORY BACKGROUND

The use of taxes and fees to try to reduce excess speculation in asset markets has a long history in the United States. As early as March 3, 1863, Congress enacted a 0.5% stamp tax on time sales of gold (plus interest at 6% per year).⁵ In reaction to this tax, gold prices fell 5% on March 4 and 10% on March 5.⁶ Beyond the obvious effect of reducing gold prices, the other effects of the stamp tax were unclear. As recently as 1965, there was a small Federal stamp tax on the sale of common stock and corporate bonds.

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Recent Proposals

There have been many recent proposals to institute some form of STT. As early as 1982, Congress considered a fee of 6¢ for each futures contract bought and sold on an organized exchange. Although the Bush administration, in its 1991 budget, proposed an 11¢ fee for futures trades, this fee never passed Congress. Proposals for a 13¢ fee in the 1992 budget and a 15¢ fee in the 1993 budget also failed in Congress. The Clinton administration is currently proposing a 14¢ fee.⁷

The 1990 budget negotiations considered a securities transaction excise tax (STET) of 0.5% on all financial transactions except Treasury securities, but this was not included in the final budget agreement. The proposal (hereafter referred to as the "0.5% broad-based STT") would have applied to trades of stocks, bonds, notes, partnership interests, options and futures contracts. Under the proposal, all sellers would pay the tax, regardless of domicile or tax status. There was some speculation that a lower rate might be used for futures and options contracts, because the implied increase in transaction costs for such securities would have been extremely large. However, the details were never made public.

Many countries have some form of securities transaction tax, although several major countries have abolished or lowered their STTs in recent years. Table 1 provides a brief summary of current transaction taxes in several major developed countries.

How Transaction Taxes Could Affect Trading Costs

Consider two popular interest rate futures contracts—the Chicago Board of Trade (CBOT) 30-year Treasury bond contract and the Chicago Mercantile Exchange (CME) Eurodollar contract. Table 2 shows the likely effects of the 14¢ fee on futures trades proposed by the Clinton administration. The London International Financial Futures Exchange (LIFFE), the third largest futures exchange in the world in terms of 1992 volume, has contracts that compete directly with both the CBOT

and CME contracts. As Table 2 shows, the proposed fee would increase the direct cost of trading on the CBOT and the CME from between 9% to 11%. Moreover, the cost advantage of the LIFFE would increase between 14.7% and 38%. If trading volume migrated from the CBOT and CME to the LIFFE, bid-ask spreads on CBOT and CME contracts could rise further, increasing transaction costs.

POTENTIAL BENEFITS

Below, we identify, summarize and evaluate four proposed benefits of an STT—reduced excess price volatility, reduced investment in unproductive speculation, refocusing of shareholders and managers away from short-term evaluation horizons, and increased tax revenues.

Reduced Excess Volatility

Since the market crash of 1987, many suggestions for reducing "excess" volatility have been discussed. One proposed weapon in the war on volatility is an STT. The theory is that there are "noise" traders who trade for reasons other than information about underlying security values.⁸ These order flows may move securities' prices away from their intrinsic values, reducing the quality of information revealed by market prices. Proponents of a securities tax argue that, by imposing a tax on the activity of noise traders, their level of activity, hence their effect on the quality and stability of prices, would decline.⁹

This logic has been attacked along many fronts. First, it is unclear whether volatility is, or ever was, "excessive."¹⁰ Indeed, many would argue that searching for antidotes for excess volatility is fruitless, because the ailment does not, in fact, exist.¹¹ Second, because a transaction tax affects all traders indiscriminately, it would reduce the activity of price-stabilizing, informed traders and liquidity providers, as well as that of noise traders. Because it is not clear whether the tax would have a greater limiting effect on the actions of stabilizing

Table 1. Securities Transaction Tax Rates In Several Major Countries

Country	Tax Rate	Comments
Germany	0.185%	Stocks (residents); 0.06% rate on stocks (nonresidents)
Hong Kong	0.030	Stocks (in form of stamp duty)
Japan	0.300	Stocks without dealers; 0.12% with dealers
	0.160	Convertible bonds and bonds with warrants without dealers; 0.06% with dealers
	0.030	All other bonds without dealers; 0.01% with dealers
	0.010	Futures—on contract value
Sweden	0.000	2% rate on stocks abolished in 1992
	0.000	3% rate on bonds, bills and CDs abolished in 1990
Switzerland	0.135	Stocks
Taiwan	0.300	Stocks—rate cut from 0.6% on January 15, 1993
United Kingdom	0.500	All domestic stocks (market-makers exempted)

Sources: Dow Jones News Retrieval and the Wall Street Journal.

Table 2. Trade Cost Comparisons Including Proposed Futures Transaction Fee

Cost per Contract	Chicago Board of Trade Bond Contract	Chicago Mercantile Exchange Eurodollar Contract	London Financial Futures Exchange Contracts
Current Nonmember Cost of Trading	\$ 1.34	\$ 1.64	\$1.29
Percentage Above LIFFE Cost	3.9%	27.1%	—
New Transaction Tax	\$ 0.14	\$ 0.14	—
Percentage Increase in Trading Cost	10.5%	8.5%	—
Percentage Above LIFFE Cost After Tax	14.7%	38.0%	—

Source: Chicago Board of Trade.

or destabilizing traders, the effects of an STT on volatility are also unclear.

Kupiec highlights the ambiguous effects of an STT on volatility.¹² In his model, portfolio shifts due to new information are diminished, so volatility could increase, decrease or remain unchanged, depending on the scenario. Grundfest and Shoven also speculate a model could be constructed to support virtually any prediction about volatility, and argue that "purely theoretical arguments about a STT's effect on volatility are thus charitably described as indeterminate and . . . these theories are as speculative as the speculation they seek to drive from the market."¹³

Reduced Excess Speculation

Although there is disagreement about the current level of market efficiency, most economists believe that an increase in the efficiency of a financial market is desirable. Stiglitz, in contrast, argues that the costs of maintaining current levels of efficiency outweigh the benefits, at least at the margin.¹⁴ He argues that financial analysts equate the marginal costs of financial research (which he calls "speculation") with their personal marginal benefits, rather than with aggregate societal benefits. These societal benefits are lower, because at the margin research reduces the value of the research of others, imposing a negative externality. As a result, too many resources are currently expended and markets are too efficient. In the tradition of Pigouvian economists, Stiglitz proposes that an STT, by reducing negative externalities, would foster a more efficient allocation of resources throughout the economy (or reduce the resources dedicated to market efficiency).

Opponents of this argument note the value judgments underpinning it.¹⁵ Ross disagrees with the belief that the tax will be effective in reducing the amount of research or speculation; he concludes:

"The net effect, then, will be only to discourage a particular type of trader, namely, traders whose activities provide liquidity to the market. But these short-term speculators can be ignored since they don't really know

what is good for them. In fact, they should thank us for taxing them out of existence."¹⁶

Reduced Emphasis on Short-Term Results

The popular press has claimed that investors, at least those with short-term trading horizons, have induced managers to act myopically. Because traders hold stocks for only a fraction of a year, it is argued, they must be signaling a preference for short-term appreciation. This focus induces managers to concentrate on short-run equity performance. To do so, they must turn down projects that are profitable in the long run in favor of less profitable short-run projects.

Stiglitz and others argue that an STT disproportionately punishes investors with short-term trading horizons, because these investors would be taxed more frequently.¹⁷ Because these myopic investors are more heavily taxed, their influence on management would be reduced. Managers would be free to engage in long-run strategies such as capital expansion and research and development.

The imposition of a transaction tax would reduce the number of active, myopic investors (or, equivalently, increase investors' average expected holding period). To reach the conclusion that this would affect managerial actions, however, one must maintain the critical assumptions that (1) long-run strategic decisions are not properly reflected in current stock prices and (2) with this knowledge, managers rationally turn down profitable long-term projects.

Increased Tax Revenues

It is naive to think that the primary motivation for the introduction of a transaction tax is to improve the functioning of capital markets. As most proponents of the tax point out, the primary motivation is to generate tax revenues. For example, the proposed 14¢ fee on futures trades is estimated to raise about \$55 million in the first year, while the most frequently quoted estimate for a broad-based 0.5% transaction tax is \$57.7 billion dollars in the first five years.

A discussion of the desirability of increasing tax revenues is beyond our scope. However, the issue of how resulting revenues are estimated is important. The simplest model for estimating revenues assumes that a flat tax rate, τ , is assigned to all transactions and, more importantly, that the imposition of the tax would affect neither trading volume nor price levels. In this simple framework, revenues can be estimated as:

$$R = \tau PQ, \quad (1)$$

where R is revenue, P the volume-weighted average price level and Q the quantity of transactions. This model is attractive because, of the three parameters, one is set by legislation and the remaining two can be estimated using historical data. (We postpone discussion of the important issue of exactly what transactions and securities are subject to the tax.)

Although parsimonious, the model in Equation 1 is inaccurate because of its strong underlying assumptions. Maintaining the assumption of a flat tax rate, but allowing for the tax to have real effects on financial markets, the simple model can be expanded to:

$$R = \tau(P + \Delta P)(Q + \Delta Q) + \Delta OR, \quad (2)$$

where ΔP is the change in average prices due to the imposition of a tax, ΔQ the change in volume associated with the tax, and ΔOR the change in other government revenues associated with the tax.

Although there is wide disagreement about expected revenues, there is little debate about values of P , Q and τ ; they are easily estimated. The various revenue-related debates must, therefore, be about values of ΔP , ΔQ and ΔOR . We will use this taxonomy to categorize arguments on both sides of the revenue debate.

■ *Changes in prices.* We reviewed above the arguments of those who believe that the imposition of a securities tax would reduce excess volatility. Many of those authors also suggest a second benefit: An STT might increase the average price of financial assets. Because asset prices are cash flows discounted by required rates of return, if required rates of return are positively related to risk, then the introduction of a risk-reducing tax should reduce required rates of return and increase financial asset prices.

Many others have argued, in contrast, that the imposition of an STT would lead to a decline in financial asset prices. Various researchers have estimated that a 0.5% broad-based STT would result in declines ranging from 1.2% to 7.7% for all NYSE stocks.¹⁸ Kupiec, White and Duffee argue that two factors contribute to the decline.¹⁹ First, basic microeconomic principles dictate that the imposition of a tax on any good reduces its equilibrium price. Because financial securities would be subjected to the tax every time they change hands, the fall in value would equal the discounted perpetuity of tax payments. Second, imposition of a tax on transactions would increase the total cost of transacting in the secondary market. A growing body of empirical evidence suggests that required rates of return are related

to transaction costs; a tax-related increase in transaction costs would increase required rates of return and reduce asset prices.

Price declines, however, would not be constant across all securities. More liquid and actively traded securities would suffer larger price drops for two reasons. First, because the tax rate is constant, the tax would represent a larger *relative* increase in the cost of trading for a liquid security. This would lead to a greater relative decline in the liquid asset's value. Second, more liquid stocks are traded more frequently, so the discounted perpetuity of expected tax payments would be larger. For these reasons, Amihud and Mendelson argue that the price decline of an index of liquid stocks, such as the Dow Jones industrials, could be as high as 18%, given imposition of a 0.5% broad-based STT.²⁰

A transaction tax affects other tax revenues as well. Price changes brought about by an STT, for example, would lead directly to changes in tax revenues on capital gains. Some even argue that the loss in revenues due to reduced capital gains would completely offset the revenues generated by the tax, at least in the short run. Moreover, if the yield on Treasury securities is affected, the cost of financing the government debt could be affected. These effects are represented by the term ΔOR in Equation 2.

■ *Changes in volume.* An STT could affect volume in at least three ways. First, as discussed above, the tax could reduce excess churning and trading. A tax on excessive speculation should decrease the amount of trading. Kiefer estimates that a 0.5% broad-based STT could reduce volume by 8%.²¹

Second, the tax would induce distortions. Because short-term financing must be rolled over more frequently than long-term debt, for example, price effects on the short-term debt would be greater. This asymmetry may induce debt issuers to shift to longer-maturity issues. In general, both issuers and holders of financial assets would rationally respond to the imposition of the tax by altering the structure and amounts of various securities to reduce tax payments and, as a consequence, reduce total trading. Because markets in derivative securities, such as futures and options, tend to have their highest volumes in relatively short-term securities, the effects of transaction taxes (such as the proposed 14¢ fee) are likely to be largest in those markets.

Finally, and most controversially, opponents of the tax argue that volume could fall to almost zero as traders and issuers move trading to countries with lower transaction costs. Pointing to precedents such as Eurodollars, Nikkei index put options and American Depository Receipts (ADRs), STT opponents suggest that traders can easily substitute securities traded in one country for those traded in another. Volume and liquidity thus flow to those international markets with the lowest taxes and other costs of transacting. Because short-term debt instruments and derivatives experience the largest relative increases in transaction costs with the STT, trading in these instruments would be the first to emigrate.²² This

argument is pivotal for tax adversaries. Several financial industry groups have circulated articles from foreign newspapers that describe the local benefits of an American transaction tax.

Summers and Summers suggest that many incentives for market emigration could be eliminated through international cooperation.²³ If foreign markets agreed to impose similar taxes, or to provide American tax authorities with sufficient information that American taxpayers could be assessed a transaction tax based on their worldwide activities, then incentives to move trading to foreign markets would vanish. It is important to note, however, that with modern computer power, even the smallest country (in size, population or existing financial activity) can plausibly host a large financial market. Cooperation would thus have to be extended by most countries. As the benefits of hosting a shadow market are very tempting, and as the trend in most financial centers is toward reducing or repealing transaction taxes, such universal cooperation is probably unrealistic.

The burden of any tax depends on the ability of both producers and consumers to substitute for the product subject to taxation (the elasticity of supply and demand). Because there are few ways to avoid an STT on futures contracts for agricultural commodities, producers and consumers in these markets would have to bear most of the burden; an STT would thus raise the cost of hedging future changes in prices. Because competing markets for financial futures exist, the burden of (and tax revenues from) an STT will be lower for these contracts, but such a tax could encourage trading in the contracts to move to other countries with lower total transaction costs.

POTENTIAL COSTS

Below, we list and evaluate five potential shortcomings of an STT—increases in the cost of capital, lack of fairness in the tax burden, distortions in optimal portfolios and capital structure, reduced market efficiency and, finally, costs of implementation, compliance and avoidance.

Cost of Capital

There is a strong empirical relation between transaction costs and required rates of return, with high-cost securities commanding higher rates.²⁴ Many commentators, have used this cross-sectional relation to argue that a transaction tax would increase required rates of return. As a result, a broad-based 0.5% tax would increase the costs of capital, determined from the rates of return demanded on new issues, by between 0.1% and 1.8% a year.²⁵

An increase in the cost of capital has many potentially negative ramifications. First, it would reduce the flow of profitable projects, reducing levels of real production, expansion, capital investment and, eventually, employment (though estimating the size of these reductions would be a heroic task). These real effects would, of course, reduce general tax revenues, so the imposi-

tion of a supposedly revenue-enhancing tax could conceivably have exactly the opposite outcome.

Those in favor of the tax generally concede that the cost of capital would increase, but argue that certain features of the tax would mitigate the increase. Kiefer argues that, because the revenues would presumably be used to reduce the federal deficit, capital currently invested in government debt would be freed to invest in corporate securities, thus lowering the equilibrium cost of capital. Furthermore, because bank and near-bank savings are not subject to the tax, capital deposited in banks could be lent to corporations at a nontaxed rate.²⁶

The Burden of an STT

One important feature of a proposed tax is its progressivity. Some argue that an STT is fair and beneficial. Stiglitz, for example, argues that, because a transaction tax would fall most heavily on those who overinvest in speculation and engage in excess trading, such a tax would benefit society as a whole.²⁷ Furthermore, because the tax is paid by those who trade financial assets, it is tempting to believe that an STT will be felt only by the wealthy.

Unfortunately, the burden of the tax would be felt by a much larger proportion of the public than just speculators and noise traders. According to the *1988 New York Stock Exchange Factbook*, there were 47 million direct owners and 133 million indirect owners of equities as of 1980. Indirect owners include those who own mutual funds or pension funds invested in equities. Imposition of an STT would hit current owners (direct and indirect) twice, as they would suffer an immediate loss in asset value and would have to pay the tax on liquidation of their portfolios.²⁸ Furthermore, the burden would not be evenly distributed across the taxpaying public. The elderly would pay a disproportionate amount, both because their holdings of financial assets are higher than average and because their investment horizon is shorter.

Portfolio and Capital Structure Distortions

Whatever the form of a proposed STT, it is likely that the introduction of such a tax would generate distortions because not all securities would be affected equally. Consider, for example, the 0.5% broad-based tax discussed in the 1990 budget summit. Though this tax is nominally "flat" (levied at a constant dollar rate), the tax would not affect all securities equally; the relative costs of holding and issuing various classes of securities would change. The greatest distortions would probably occur in the short-term commercial paper market, estimated to be worth \$350 billion.²⁹ Because these securities have short maturities and trade frequently, they would suffer an above-average incidence of tax. Further, their yields have to compete against those offered by Treasury securities, which would not be subject to the transaction tax. Thus required rates of return on paper would rise dramatically, perhaps to the point where the market would disappear.

As the tax would change the *relative* costs of holding and issuing different classes of securities, market-clearing prices, and the supplies of and demands for the various securities classes, would also change. It follows that capital structures and the average investment portfolio would change, too. The relatively high incidence of tax on commercial paper, for example, would increase its required rate of return. So paper would make up a smaller proportion of aggregate corporate offerings, total capital structure and total portfolio holdings. The securities that would be most affected by any flat-rate tax (or the currently proposed 14¢ fee on futures trades) would be options and futures contracts, because they currently have among the lowest transaction costs per unit of risk. These changes from the no-tax equilibrium to the with-tax equilibrium represent distortions.

Illiquidity and Market Inefficiency

The imposition of an STT would also affect the liquidity of financial assets. As well as affecting transaction costs directly, the tax could affect liquidity indirectly via the bid-ask spread. Models of the determinants of the bid-ask spread identify three key components—order processing costs, inventory or price risk, and the effects of information asymmetry. The first component is part of the market-maker's fixed costs of doing business, and the second represents compensation for the risk of holding inventories of risky securities. The final component reflects the possibility that a trader on the other side of the transaction may have superior information about intrinsic value. In a competitive environment, market-makers equate the revenues garnered from trading against uninformed traders to their costs.³⁰

A transaction tax affects market-makers in several ways. First, it can be expected to reduce trading volume, so the number of transactions over which the market-maker can apportion his fixed costs declines. This increases the first part of bid-ask spread. Second, since the advent of liquid derivative markets, equity market-makers have begun hedging their risky inventory positions using exchange-traded derivatives. A transaction tax on derivatives would increase market-makers' cost of insuring these risky positions. This cost increase would be passed along as an increase in the second part of the bid-ask spread. Finally, if, as advocates of the tax speculate, the tax reduces the actions of uninformed or noise traders more than it does the actions of informed traders, then the odds that the specialist is facing an informed trader increase; this increases the third (information asymmetry) part of spreads.

Increased spreads would reduce market efficiency by raising the costs of, hence discouraging, trades that take advantage of asset mispricing.³¹ When the cost of transacting is increased, both directly via transaction costs and indirectly via bid-ask spreads, larger and more persistent mispricing should be expected.

Implementation, Compliance and Avoidance

Implementing a broad-based transaction tax would require much thought on issues as simple as definitions. Given the growth in complexity and diversity of derivative and hybrid instruments, traditional definitions of asset classes have been blurred. Should a junk bond issued by a corporation with no public equityholders, for example, be classified as debt or equity? Furthermore, the tax base is unclear for many securities. Should an option be taxed on its strike (or exercise) price, on the current stock price, or on the price of the option itself? Should a futures position written on \$1 million worth of Treasury bonds, which requires zero net initial investment, be taxed at zero (because Treasury securities would be exempt), or on a face value of \$1 million? Should transactions by mutual funds be taxed, or just redemptions by mutual fund holders, or both?

A new tax would require administration, auditing, compliance and collection departments, or expanded existing tax units. The costs of implementing these must be considered in calculating expected net revenues.

Finally, resources would be spent to avoid the tax. As with any tax, taxpayers and collectors under an STT would expend resources unproductively, engaging in games of implementation, avoidance and compliance. These problems could be especially serious for a broad-based transaction tax. Professionals would expend effort to design new securities, markets and methods of reducing the incidence of the tax, both in the U.S. and abroad. Recall that some economists favor an STT because it discourages unproductive speculative activity. Ironically, the introduction of an STT could represent a boon to those employed in "unproductive" financial engineering.

EMPIRICAL EVIDENCE

The number of issues associated with a transaction tax is large, and there are arguments on both sides of most issues. Unfortunately, despite the importance of such a tax, little empirical evidence about the imposition of transaction taxes exists to help resolve these issues. This void is partially filled by studies of the effects of differential transaction costs. Below, we review the evidence that exists for three issues that have been examined—the relation between trading costs and volume (ΔQ), the relation between asset prices and volume (ΔP), and the relation between trading costs and volatility.

Sensitivity of Trading Volume to Trading Costs

Ericsson and Lindgren analyze cross-sectional data for 23 exchanges in 22 countries and estimate that doubling the transaction tax (from 1% to 2%) would reduce average turnover (trading volume/shares outstanding) to zero. The *elasticity* of trading volume with respect to price (the percentage change in volume caused by a 1% change in price) is about -1.00 . Ericsson and Lindgren do not measure differences in brokerage commissions, bid-ask spreads or other forms of transac-

tion costs, so their estimates of the effects of taxes could be affected if these other transaction costs are correlated with the levels of taxes across countries.³²

Sweden enacted a 1% transaction tax in 1984 and increased it to 2% in 1986. By 1990, over 50% of the volume in Swedish shares traded in London.³³ Also, the Swedish interest rate options market disappeared. Thus, in cases where traders have a close substitute available, they respond to a substantial STT by moving to other markets to avoid taxation.

In May 1975, the SEC forced the major securities exchanges in the U.S. to abandon fixed commission rates. Using cross-sectional data for individual securities in the U.S. before the abolition of fixed commission rates, Epps estimates the elasticity of trading volume with respect to transaction costs to be about -0.25 . There are some indications, however, that Epps' elasticity estimate is too low. Jarrell finds that average commission rates fell by about 30% from 1975 to 1978, and that share turnover from May 1975 to December 1981 was 30% higher than it was in the period January 1968 to April 1975. He does not attempt to measure total transaction costs, including bid-ask spreads, but his implied elasticity of trading is much higher than Epps'. Stoll, however, finds that the abolition of fixed commission rates did not change the liquidity of the market for large blocks of stock, although commissions did come down.³⁴

Based on the limited evidence available to date, it seems that the elasticity of trading volume with respect to transaction costs is between -0.25 and -1.35 . An STT of 0.5% would greatly affect securities that currently have relatively low transaction costs, such as options and futures contracts, or actively traded exchange-listed stocks.

Effects on Asset Values

There are several studies of the effects of trading costs on asset values. Amihud and Mendelson analyze cross-sectional data on average returns and bid-ask spreads for U.S. stocks listed on the New York Stock Exchange and find a strong positive relation, suggesting that stocks with higher trading costs must offer higher returns to attract investors.³⁵ This means that asset prices are lower for stocks with higher trading costs, all else equal. Amihud, Mendelson and Wood find that spreads and price changes were positively correlated around the crash in October 1987.³⁶ Amihud and Mendelson estimate that a broad-based 0.5% transaction tax would reduce the value of highly liquid stocks by as much as 18% (although they probably overstate the size of the tax effect, because they assume that the tax will not reduce trading volume).³⁷

Amihud and Mendelson show that bid-ask spreads and yields are higher for U.S. Treasury notes than for Treasury bills with the same maturity date and promised cash flow.³⁸ Several other studies show that unregistered "letter" stock frequently sells at a 20% to 35% discount from otherwise equivalent marketable securi-

ties.³⁹ The latter comparisons of the effects of illiquidity are closer to being controlled experiments than the studies across securities issued by different entities, or studies based on time series changes of liquidity.

It must be remembered, however, that the relevance of these studies to predicting the effects of a transaction tax are limited because they are all cross-sectional. More pertinent results would be derived from studies of large changes in trading costs that occurred without being anticipated by the market. Unfortunately, there are only a few cases where such an unexpected change took place. As noted earlier, the 0.5% stamp tax on time sales of gold imposed during the Civil War led to an immediate 15% drop in gold prices. The Swedish All-Equity Index fell by -2.2% on October 24, 1983, when a 1% securities transaction tax was first announced, and it fell again by -0.8% on March 11, 1986, when it was announced that the transaction tax would be raised to 2%. It is not surprising that the price effect was smaller in 1986, because there was much prior speculation about a tax increase.⁴⁰ This highlights a fundamental problem with measuring effects on asset prices from time series data: Changes in asset prices reflect revisions in expectations.

Effects on Volatility

Roll studies measures of stock return volatility across 23 countries from 1987 to 1989 to see whether there are systematic differences that can be explained by tax or regulatory methods, such as margin requirements, price limits or transaction taxes. He finds no evidence that volatility is reliably related to transaction taxes. Moreover, the crash of October 1987 was at least as severe in countries with transaction taxes as in those without them.⁴¹

Shiller remarks that booms and busts occur in real estate markets with about the same frequency as in stock or bond markets. Real estate markets have much higher transaction costs (over 7% of asset value), so it seems that higher trading costs are not a sufficient condition for preventing large declines in price (although volatility of real estate prices measured over short intervals will seem much lower because of infrequent trading).⁴²

The extensive literature on the relation (or the lack thereof) between stock return volatility and margin requirements imposed by the Federal Reserve Board provides little reason to believe that increasing the cost of trading (by raising margin requirements) has any reliable effect. While Hardouvelis claims to find a negative relation between margin rates and subsequent volatility, many others have disputed his interpretation of the facts.⁴³

Although stock market volatility is widely perceived to have become higher since active trading in options and futures contracts began, this perception is not supported by facts. Schwert shows that stock volatility has not been unusually high, except for a brief period around the October 1987 crash.⁴⁴ Moreover, Skinner

shows that the volatility of individual stocks declined after options trading related to those stocks began in the 1973-86 period.⁴⁵ It seems that the beneficial effects of liquidity (low transaction costs) reduce, rather than increase, volatility.

There are no direct tests of relations between transaction taxes and volatility, but many tests link volatility to other types of transaction costs. These tests are almost unanimous in showing a positive relation between transaction costs and volatility. Thus, any effects of an STT on volatility will probably be detrimental.

CONCLUSIONS

Because of the massive size of the tax base, and the general misperception that only wealthy speculators will bear the burden, proposals for a securities transaction tax will probably be hotly debated for some time to come. Advocates contend that an STT can reduce the negative externalities associated with securities trading. Opponents point out that the positive externalities associated with securities trading (such as liquidity, price informativeness and low cost of capital) would also be discouraged by taxation. There is little evidence available to date to support the notion that the negative externalities outweigh the positive effects of securities trading. Moreover, tax incidence and avoidance and the attendant societal costs make an STT questionable public policy.

Interestingly, none of the proposals for an STT has suggested that the primary or secondary markets for Treasury securities should be covered by a new transaction tax. This suggests that the U.S. government recognizes that increasing transaction costs for the securities it sells to finance its own activities would raise the cost of borrowing, especially in the case of short-term securities such as Treasury bills and notes. A small increase in the

required yield on newly issued Treasury securities could more than offset any revenues from a transaction tax.

Liquid markets in options and futures contracts make the primary market for Treasury securities more liquid by allowing traders to hedge their risk cheaply. Even the fee on futures transactions currently under consideration could end up costing multiples of the revenues it would raise. However, this effect would be indirect, hidden from most taxpayers and voters. Of course, it is curious that government would exempt only its own securities from a broad-based transaction tax. This seems to imply that legislators and regulators understand the potentially large indirect costs of such taxes, but do not mind imposing those costs on other issuers of securities.

The list of questions that require further study is long. In today's environment of international competition, low-cost communication and sophisticated financial markets, the effects of a fixed-fee (such as the proposed 14¢ futures fee) or a broad-based 0.5% STT would be extremely difficult to anticipate with any precision. Some financial markets might migrate to other countries or disappear altogether. Trading volume, bid-ask spreads and volatility could all be affected, but the effects are likely to vary widely across different types of markets and securities. Effects on the profitability and size of financial institutions are also likely to differ, depending on the proposals implemented. Estimates of the effects of a securities transaction tax on the value of existing assets, and the implications for issues such as pension policy or the regulation of financial institutions, are also likely to vary. Finally, but perhaps most importantly, estimates of an STT's effects on the cost of capital, and the attendant effects on employment, economic growth and U.S. competitiveness, are probably the least precise of all.⁴⁶

FOOTNOTES

1. *Wall Street Journal*, March 23, 1987.
2. J. E. Stiglitz, "Using Tax Policy to Curb Speculative Short-Term Trading," *Journal of Financial Services Research* 3 (1989), 101-15; L. H. Summers, "Lost Horizons: Three Steps to Economic Prosperity," *The New Republic*, June 26, 1989; and L. H. Summers and V. P. Summers, "When Financial Markets Work Too Well: A Cautious Case For a Securities Transactions Tax," *Journal of Financial Services Research* 3 (1989), 261-86. As Chair of the Senate Finance Committee, Bentsen expressed interest in an STT as early as March 21, 1990 (*Dow Jones News Wire*).
3. *Chicago Tribune*, April 5, 1993.
4. *The Wall Street Journal* (October 2, 1990) identified Rubin, then a managing partner of Goldman Sachs, as an effective opponent of STTs.
5. Time sales of gold are similar to what are now called forward contracts. For example, a two-month time sale would be subject to a stamp tax of 1.5%. For further discussion of this transaction tax on gold trades, see W. C.

Mitchell, *A History of the Greenbacks* (Chicago: University of Chicago Press, 1903).

6. *New York Times*, March 5 and 6, 1863.
7. See the *Wall Street Journal*, September 23, 1982, *Dow Jones News Wire*, March 9, 1990, the *Wall Street Journal*, February 7, 1991 and the *Wall Street Journal*, January 30, 1992.
8. Or, more colorfully, "dentists and doctors in the midwest and the retired individuals in the sunbelt. . ." (Stiglitz, "Using Tax Policy," *op.cit.*), who "believe (irrationally) that trading systems, horoscopes, etc., are beneficial in forecasting prices" (R. Roll, "Price Volatility, International Market Links, and Their Implications for Regulatory Policies," *Journal of Financial Services Research* 3 (1989), 211-46). This category includes portfolio insurers and other so-called "positive feedback" traders (L. Kodres, "Positive Feedback Traders in the S&P 500 Index Futures Market" (Working paper, University of Michigan, 1993)), because their trades are based only on changes in reported prices, rather than on some notion of intrinsic value.

9. Summers and Summers, "When Financial Markets Work Too Well," *op.cit.* Robert J. Shiller ("Who's Minding the Store?" in *The Report of the Twentieth Century Fund Task Force on Market Speculation and Corporate Governance* (New York: Twentieth Century Fund, 1992)) makes the novel suggestion that transaction taxes would be especially effective in reducing volatility if the tax rate were a function of contemporaneous market activity. That is, taxes would be imposed (or imposed at a higher rate) during high-volume or volatility days, when the actions of destabilizing noise traders are presumably the most pernicious. Of course, the cost of administering such a system would be high.
10. J. A. Grundfest and J. B. Shoven, "Adverse Implications of a Securities Transactions Excise Tax," *Journal of Accounting, Auditing and Finance* 6 (1991), 409-42. Also see J. A. Grundfest, "The Damning Facts of a New Stocks Tax," *Wall Street Journal*, July 23, 1990.
11. G. W. Schwert, "Stock Market Volatility," *Financial Analysts Journal*, May/June 1990.
12. P. H. Kupiec, "Noise Traders, Excess Volatility, and a Securities Transaction Tax" (Working paper, Board of Governors of the Federal Reserve System, 1991) and P. H. Kupiec, "On the Ramifications of a Securities Transactions Tax for the Function and Efficiency of Capital Markets" (Working paper, Board of Governors of the Federal Reserve System, 1992).
13. Grundfest and Shoven, "Adverse Implications," *op.cit.*
14. Stiglitz, "Using Tax Policy," *op.cit.*
15. D. W. Kiefer, "The Securities Transactions Tax: An Overview of the Issues" (Library of Congress, 1990).
16. S. A. Ross, "Commentary: Using Tax Policy to Curb Speculative Short-Term Trading," *Journal of Financial Services Research* 3 (1989), 119.
17. Stiglitz, "Using Tax Policy," *op.cit.*
18. P. H. Kupiec, A. P. White and G. Duffee, "A Securities Transaction Tax: Beyond the Rhetoric," *Research in Financial Services Private and Public Policy*, forthcoming, and D. W. Kiefer, "A Stock Transfer Tax: Preliminary Economic Analysis" (Library of Congress, 1987).
19. *Ibid.*
20. Y. Amihud and H. Mendelson, "Transaction Taxes and Stock Values," in K. Lehn and R. Kamphius, eds., *Modernizing US Securities Regulation: Economic and Legal Perspectives* (Homewood, IL: Business One Irwin, 1993).
21. Kiefer, "A Stock Transfer Tax," *op.cit.*
22. Grundfest and Shoven, "Adverse Implications," *op.cit.*
23. L. H. Summers and V. P. Summers, "When Financial Markets Work Too Well," *op.cit.*
24. Y. Amihud and H. Mendelson, "Asset Pricing and the Bid-Ask Spread," *Journal of Financial Economics* 17 (1986), 223-49.
25. Amihud and Mendelson, "Transaction Taxes and Stock Value," *op.cit.*; Kupiec, White and Duffee, "A Securities Transaction Tax," *op.cit.*; and Grundfest and Shoven, "Adverse Implications," *op.cit.*
26. Kiefer, "The Securities Transaction Tax," *op.cit.*
27. Stiglitz, "Using Tax Policy," *op.cit.*
28. Kiefer, "The Securities Transaction Tax," *op.cit.*
29. Grundfest and Shoven, "Adverse Implications," *op.cit.* The relative effect of the tax on a security would depend on its current liquidity and maturity, whether it's traded publicly or privately and, in the case of options, the strike price and underlying stock price or premium.
30. We use the term market-maker loosely and include all suppliers of liquidity, including limit-order traders and those who compete against exchange-appointed specialists in any way. Therefore, the problems discussed here cannot be avoided by simply exempting specialists from the tax.
31. For discussions of this in the context of index arbitrage, see A. C. MacKinlay and K. Ramaswamy, "Index-futures Arbitrage and the Behavior of Stock Index Futures Prices," *Review of Financial Studies* 1 (1988), 137-58 and H. R. Stoll and R. E. Whaley, *Futures and Options: Theory and Applications* (Cincinnati: South-Western Publishing Company, 1993).
32. J. Ericsson and R. Lindgren, "Transaction Taxes and Trading Volume on Stock Exchanges—An International Comparison" (Working paper, Stockholm School of Economics, 1992). Their elasticity estimate is consistent with that of P. D. Jackson and A. T. O'Donnell ("The Effects of Stamp Duty on Equity Transactions and Prices in the U.K. Stock Exchange" (Bank of England, 1985)) and R. Lindgren and A. Westlund ("Transaction Costs, Trading Volume and Price Volatility on the Stockholm Stock Exchange," *Skandinaviska Enskilda Banken Quarterly Review* 2 (1990), 30-35).
33. S. R. Umlauf, "Transaction Taxes and Stock Market Behavior: The Swedish Experience," *Journal of Financial Economics* 33 (1993), 227-40.
34. T. Epps, "The Demand for Brokerage Services: The Relation Between Security Trading Volume and Transaction Cost," *Bell Journal of Economics* 7 (1976), 163-95; G. A. Jarrell, "Change at the Exchange: The Causes and Effects of Deregulation," *Journal of Law & Economics* 27 (1984), 273-312; and H. R. Stoll, *Regulation of Securities Markets: An Examination of the Effects of Increased Competition*, New York University Monograph Series in Finance and Economics (New York: New York University, 1979).
35. Amihud and Mendelson, "Asset Pricing and the Bid-Ask Spread," *op.cit.*
36. Y. Amihud, H. Mendelson and R. A. Wood, "Liquidity and the 1987 Stock Market Crash," *Journal of Portfolio Management*, Spring 1990.
37. Amihud and Mendelson, "Transaction Taxes and Stock Value," *op.cit.*
38. Y. Amihud and H. Mendelson, "Liquidity, Maturity, and the Yields on U.S. Treasury Securities," *Journal of Finance* 46 (1991), 1411-25.
39. S. P. Pratt, *Valuing a Business: The Analysis and Appraisal of Closely Held Companies* (Homewood, IL: Dow Jones-Irwin, 1981).
40. Umlauf, "Transaction Taxes," *op.cit.*
41. Roll, "Price Volatility," *op.cit.*
42. R. J. Shiller, in D. H. Chew, ed., "Volatility in U.S. and Japanese Stock Markets: A Symposium," *Journal of Applied Corporate Finance* 5 (1992), 4-35.
43. G. A. Hardouvelis, "Margin Requirements, Volatility, and the Transitory Component of Stock Prices," *American Economic Review* 80 (1990), 736-62; P. H. Kupiec, "Initial Margin Requirements and Stock Returns Volatility: Another Look," *Journal of Financial Services Research* 3 (1989), 287-301; and G. W. Schwert, "Business Cycles, Financial Crises and Stock Volatility," *Carnegie-Rochester Conference Series on Public Policy* 31 (1989), 83-125.
44. Schwert, "Stock Market Volatility," *op.cit.*
45. D. J. Skinner, "Options Markets and Stock Return Volatility," *Journal of Financial Economics* 23 (1989), 61-78.
46. The Catalyst Institute (formerly called the MIDAMERICA Institute) provided support for this research.