Should We Throw Sand in the Gears Of Financial Markets?

By Craig S. Hakkio

The volatility of financial markets in recent years has led to increased concern. As trading of financial assets on organized exchanges and over-the-counter markets has grown, events such as the 1987 stock market crash and the 1992 Exchange Rate Mechanism crisis in Europe have raised fundamental questions about the role these markets play in the economy. In particular, there is concern that much of the increased trading of financial assets is of a short-term, speculative nature that adds little value to the intermediation process and in the extreme case may distort the efficient functioning of financial markets.

This view has led some economists to advocate a securities transaction tax (STT). Such a tax, it is argued, when applied to a broad range of financial transactions, would raise the cost of short-term speculative trading, reduce financial market volatility, and improve the efficiency of financial markets. This type of tax might also raise substantial revenue that could help reduce the federal budget deficit. The revenue potential has not gone unnoticed in Washington, where recent budget proposals by both the Bush and Clinton administrations have included an STT.

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The proposal of an STT, however, is highly controversial. Opponents doubt that an STT would reduce financial market volatility. According to these analysts, throwing even a little sand in the gears of financial markets is not benign—it would damage the markets by reducing liquidity and raising the cost of capital for U.S. business. Opponents also doubt an STT would yield substantial revenue gains because investors could avoid the tax by shifting to tax-exempt activities or moving transactions outside U.S. markets.

This article explores the pros and cons of a securities transaction tax. The article first presents a brief introduction to securities transaction taxes. The article next presents the case for introducing a small securities transaction tax which rests on the assumption of large potential benefits from the tax. The article then presents the case against a securities transaction tax, including the prospective costs incurred by imposing the tax. The article concludes that the proponents have overstated the likely benefits of a securities transaction tax and underestimated the potential costs.

INTRODUCTION TO SECURITIES TRANSACTION TAXES

A securities transaction tax is levied on the sale of securities, such as stocks, bonds, options,

or futures. The tax is paid each time a security is sold. As such, a number of operational issues are involved including which security transactions are taxed and at what rate.

Economists advocating an STT tend to favor a broad-based tax. A broad-based tax would apply to all marketable securities—stocks, bonds, options, futures, and other financial derivatives. Such a tax was considered, but not adopted, in the negotiations on the Omnibus Budget Reconciliation Act of 1990. Over the years, a number of prominent economists, including John Maynard Keynes, Lawrence Summers (now Undersecretary of the Treasury), and Joseph Stiglitz (now a member of the President's Council of Economic Advisers) have supported a broad-based STT.

More narrow taxes have been proposed in Congress and by the Bush and Clinton administrations. The narrow taxes could, for example, be levied only on trading in derivative markets. Congress, the Bush Administration, and the Clinton Administration have considered taxes on futures trading or options on futures trading. More specifically, various Bush Administration budgets included fees on futures trading: an 11 cent fee (in 1991), a 13 cent fee (in 1992), and a 15 cent fee (in 1993). The Clinton Administration proposed a fee of 14 cents on futures and options on futures (1994).[1]

Another kind of narrow transaction tax has been proposed by Eichengreen and Wyplosz. They recommend an implicit tax on foreign exchange transactions to reduce the likelihood of speculative attacks against European Monetary System (EMS) currencies. The tax is implicit because it would require financial institutions that purchase foreign exchange to make a non-interest bearing deposit with the central bank. If financial institutions are forced to make a deposit equal to 0.1 percent of the transaction and the interest rate is 10 percent, then the tax would be 1 percent of the transaction. As interest rates rise, so would the tax rate.

While the idea of an STT is somewhat novel in the United States, many industrial countries already have some form of a securities tax. Table 1 shows the wide range of securities taxed by different countries and the wide range of tax rates. Transaction tax rates differ according to the type of financial instruments affected (equities are typically taxed at a higher rate than derivatives), the location of trade (on or off an exchange, at home or abroad), and the identity of the buyer or seller (domestic or foreign resident, market-maker or general trader).

To focus on the economic arguments that support an STT, this article considers a broad-based 0.5 percent tax applied to the sale of stocks, bonds and other debt instruments, options, futures, and other financial securities. Since most countries and proposals exempt government securities, this article assumes that Treasury securities are exempt. And while the tax could be applied to the sale of new issues, the analysis in this article applies the tax only to transactions in secondary markets.

An STT of 0.5 percent would increase transaction costs considerably, as an example from the New York Stock Exchange (NYSE) makes clear. Commission fees for large institutions on the NYSE are about $0.13 per share, and the average bid/asked spread is about $0.25 per share (Hubbard, p. 997). Therefore, transaction costs are about $0.38 per share in the absence of taxes. Applying a 0.5 percent tax to an average share price of $34.10 would increase transaction costs $0.17 per share to about $0.55, a 50 percent increase in transaction taxes.

THE CASE FOR AN STT

Proponents argue that an STT would provide three important benefits. An STT would (1) reduce excessive financial market volatility, (2) reduce the amount of wasted resources in financial markets, and (3) substantially increase government revenue.

Reduce excess volatility

Most advocates believe that financial markets

Table 1
Transaction Taxes in the OECD

Country	Tax size 1993 (percent)	Description	Notes
Australia	.30	Transaction tax	
Austria	.15	Transfer tax	May be avoided ex country
	.06	Arrangement fee	May be avoided ex country
	.04-.09	Courtage fee	May be avoided ex country
Belgium	.03	Stock market fee	May be avoided ex country
	.17	Stamp tax on buys and sells	May be avoided ex country
Canada		No taxes	
Denmark		No taxes for nonresidents	
Finland		No taxes	
France		No taxes for foreign investors	
Germany	.06	Courtage tax (official broker fee)	May be avoided by trading off the exchange
Greece	.30	Transfer tax	For registered shares only
Ireland	1.00	Stamp duty on purchases	
Italy		No taxes	
Japan	.30	Tokyo stock exchange sales tax	May be avoided ex country
Netherlands		No taxes	
New Zealand		No taxes	
Norway		No taxes	
Portugal	.04	Stock exchange levy	
	.05	OTC levy	
Spain	.15	Clearing	Stock exchange fees
Sweden		No taxes	
Switzerland	.075	Stamp tax	May be avoided ex country
	.010	State tax	May be avoided ex country
	.005	Exchange fee	May be avoided ex country
Turkey		No taxes	
United Kingdom	.50	Stamp duty	Assessed on purchases only
	(£2)	PTM levy	Assessed on trades above £10,000
United States	($.01)	SEC fee	Assessed on sales per $300 of value

Note: Data for Iceland, Luxembourg, and Yugoslavia were not available.

Source: Union Bank of Switzerland, UBS Global Research, *Guide to Global Equity Markets*, 4th ed., January 1994.

are too volatile. By raising the cost of trading, an STT would reduce short-term trading, which is thought to be a principal cause of excess volatility. The expectation is that prices would better reflect fundamental values and that the cost of capital would fall.

Since the STT is paid each time a security is sold, it would have a greater effect on short-term trading than long-term trading. Consider the effect of a 0.5 percent tax on an investment yielding a 4.0 percent return (see appendix for details on calculations). In this example, the tax on one-day trading is 282.7 percentage points, while the tax on five-year trading is only 0.1 percentage points. The key is that the tax must be paid whether the security is held for one day or five years. For a one-day trade, a 0.5 percent tax becomes an annualized cost of 282.7 percent. For a five-year trade, a 0.5 percent tax is a 0.1 percent tax per year. Since the tax is higher on short-term trading strategies than long-term trading strategies, short-term trading would be discouraged more than long-term trading. With short-term trading reduced, the average holding period would increase.

Before discussing why an STT might reduce excess financial market volatility, it is important to understand why volatility may arise. Volatility has two components—fundamental volatility and excess volatility. Fundamental volatility reflects the fact that security prices change when the fundamental value of the security changes. In contrast, excess volatility occurs when security prices change for reasons unrelated to the fundamental value.

Fundamental volatility is part of a well functioning financial market. When the fundamental value of a security changes—such as when the expected future stream of income changes—the price of the security also changes. But new information about future income streams can be volatile. As a result, the volatility of expected future income streams can cause considerable volatility of prices. Such changes are called fundamental volatility.

The economy benefits from prices reflecting

fundamental values because investment funds go to their most valuable uses. Companies with good investment opportunities have high fundamental values, while companies with poor investment opportunities have low fundamental values. Therefore, if prices reflect fundamental values, companies with good investment opportunities will be able to sell their stock at a high price, allowing them to raise funds at lower expense than companies with poor investment opportunities.[2]

Many analysts believe that financial market volatility can also be excessive (Summers and Summers; Stiglitz). As evidence of excess volatility, analysts point to October 1987. It is hard to identify any fundamental changes that occurred then to justify a 22 percent crash in the stock market. As further evidence, analysts recall a 1981 study by Shiller, who found that stock prices were more volatile than would be predicted by the actual volatility of dividends.

The condition of excess volatility is said to reflect "irrational" investor behavior. Irrational behavior reflects waves of optimism or pessimism, or in Keynes' words, "animal spirits" possessed by traders. Economists now use the term "noise trader" to describe investors who exhibit such waves of optimism or pessimism. The distinguishing feature of noise traders is that they buy and sell securities based on something other than fundamentals. Since these animal spirits come and go, seemingly at random, stock prices are more volatile than if they reflected only economic fundamentals.

The proponent's view of an STT is that it reduces excess volatility by reducing short-term trading. According to this view, noise traders are primarily short-term traders. Therefore, by reducing short-term trading, an STT would reduce noise trading—the primary cause of excess volatility.

Reducing excess volatility could have two benefits. First, less excess volatility could spur investment spending. With less volatility and therefore less risk, the cost of capital would be lower because the risk premium on an investment would fall. A lower cost of capital would make it

cheaper to raise funds in the stock market, causing investment spending to rise.

Reduced volatility could also lead to a more efficient allocation of existing investment spending. With excess volatility, prices can move away from their fundamental value. For example, if traders are bearish, they may sell stocks because they think the price is going to fall, even if the fundamental value has not changed. To the extent that an STT drives noise traders out of the market, prices would more closely track fundamental values. As result, not only would investment spending rise, but the existing spending would be allocated more efficiently.

Reduce wasted resources

A second potential benefit of an STT is that fewer resources would be wasted on financial markets. Tobin, Summers and Summers, and Stiglitz believe that too many resources are spent on trading paper assets rather than on creating wealth. For example, James Tobin, the winner of the 1981 Nobel Prize in economics, wrote:

> What is clear is that very little of the work of the securities industry, as gauged by the volume of market activity, has to do with the financing of real investment in any very direct way. Likewise, those markets have very little to do, in aggregate, with the translation of the saving of households into corporate investment (1984, p. 11).

Undeniably, the cost of operating our financial markets is high. Summers and Summers (p. 27) estimate that the cost of operating our securities markets was over $75 billion in 1987, or one-fourth of total corporate profits and close to half of corporate net investment.

But is the cost of operating our financial markets too high? A purpose of financial markets is to channel household saving into creating wealth—building new factories and making people healthier. If too many of the people who work in financial markets are short-term speculators,

rather than creators of wealth, they simply are acting to reallocate claims to wealth. Moreover, financial institutions spend considerable time and money creating and trading new and exotic financial instruments, such as financial derivatives. While derivatives allow financial institutions and speculators to earn lots of money, some analysts do not believe derivatives create wealth. According to this view, short-term speculation is a waste, and many of the new and exotic financial instruments are overkill.

As a clarifying example, suppose a speculator learns—before anyone else—that a pharmaceutical company plans to announce a cure for diabetes. By buying shares of the pharmaceutical company now, and selling the shares after the public announcement is made, the speculator can make a great deal of money. The result of the trade is that ownership of the pharmaceutical company has changed, but no wealth has been created. Proponents of an STT believe much of the $75 billion currently used to operate financial markets is not used to create wealth, but rather simply reallocates claims to existing wealth resulting in a waste of resources.

Increase government revenue

A third potential benefit of an STT is the revenue it might raise. Without knowing the precise form of the tax, estimating the amount of revenue collected is difficult. The Congressional Budget Office, however, has estimated that a broad-based 0.5 percent STT would raise $57.7 billion in the first five years. An alternative estimate can be obtained by looking at the amount of revenue raised in other countries. While the taxes differ among countries, revenues raised in 1985 ranged from 0.04 percent of GNP in Germany to 0.48 percent of GNP in Switzerland. Applying these percentages to the United States implies that an STT could raise between $2.6 billion and $30.6 billion in 1993.

THE CASE AGAINST AN STT

Opponents of an STT argue that (1) the benefits of an STT are overestimated, (2) an STT would have harmful side effects, and (3) the tax is likely to be ineffective.

Overestimated benefits

The case for an STT rests on the assumption that prices are excessively volatile—that prices deviate from fundamental values. Opponents of an STT are not convinced that financial markets are excessively volatile. Moreover, even if markets are excessively volatile, opponents doubt that an STT would reduce excess volatility. Opponents further doubt that an STT would save resources currently wasted in financial markets.

STT and excess volatility. Deciding whether volatility is excessive is complicated by the difficulty of determining the fundamental value of a security. Fundamental value is inherently unobservable. Financial analysts may be able to estimate what they call a fundamental value, but it is obviously an estimate with a margin of error. But without such knowledge, it is impossible to determine whether prices are excessively volatile.

There may be ways, however, to examine volatility without knowing the fundamental value of a security. For example, many people believe excess volatility increased with the introduction of financial derivatives. If true, and if fundamental volatility did not change with the introduction of derivatives, then measured volatility should have increased in the 1980s as derivatives became more prevalent.

The evidence on whether volatility increased in the 1980s is mixed. Schwert (p. 23) found that volatility on broad portfolios of New York Stock Exchange common stocks was not unusually high in the 1980s, except during brief episodes such as the October 1987 crash.[3] Therefore, if derivatives caused excess volatility to increase, the data do not obviously support the argument.

But even if excess volatility is a problem, an STT may not be the solution. Neither economic theory nor empirical evidence strongly supports the idea that transaction taxes would reduce excess volatility.

Economic theory suggests that transaction taxes could either increase or decrease excess volatility. For example, assume there are two kinds of traders—informed traders and noise traders. Informed traders assess the fundamental value of a security, then buy when the price is low and sell when the price is high. By increasing the cost of trading, an STT reduces the amounts of both noise trading and informed trading. The effect on excess volatility then depends on which group of traders is hit harder. If the tax reduces the amount of noise trading more than informed trading, excess volatility would fall. However, if the tax reduces informed trading more than noise trading, excess volatility could rise.

Since economic theory is silent on whether an STT would reduce excess volatility, perhaps empirical evidence can shed light on the issue. Opponents believe empirical evidence contradicts the idea that an STT would reduce excess volatility.

Security transaction taxes do not appear to have alleviated the worldwide stock market crash of October 1987. While most industrialized countries have an STT, all countries experienced a stock market crash. Moreover, the evidence does not suggest that countries with an STT experienced a less severe crash. Chart 1 shows the relationship between the tax rate and the average daily percentage change in stock prices in 23 countries for the period one week before the beginning of the crash on October 19 to two weeks afterward. The average percentage decline in U.S. stock prices, -1.4 percent, is indicated by the horizontal line on the chart. Of the 19 countries with an STT, 12 (63 percent) had greater declines and seven (37 percent) had smaller declines than the United States. In addition, there does not appear to be a significant relationship between the decline and

Chart 1

STT Rates and the October 1987 Decline in Stock Prices
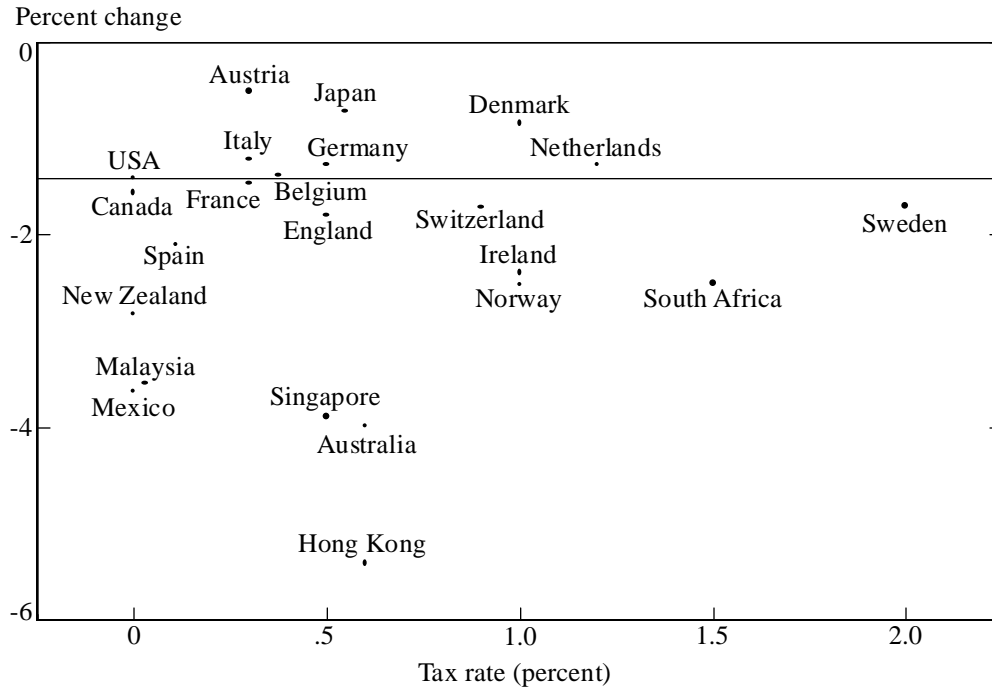
Percent change

Note: The vertical axis is the percent change in stock prices for the period one week before the October 1987 stock crash to two weeks after the crash. The horizontal line is the average percentage decline in U.S. stock prices.

the tax rate. The rank correlation between the tax rate and average decline is 0.03, which is insignificantly different from zero.[4]

In a 1989 study of 23 industrial countries, Roll found no evidence relating stock price volatility to stock market price limits, margin requirements, and transaction taxes. Roll studied the periods January 2, 1987, to October 9, 1987, and November 2, 1987, to March 31, 1989. Finding that transaction taxes are inversely but insignificantly correlated with volatility across countries, he concluded: "The effect is too questionable for taxes to be used with confidence as an effective policy instrument" (p. 241).

In a 1993 study of the Swedish experience with STTs, Umlauf surprisingly found that "all else being equal, taxes increase volatility" (p. 228).[5] Thus, the weight of empirical evidence casts doubt on the claim that an STT would reduce excess volatility.

STT and wasted resources. Opponents of an STT believe that neither speculation nor the creation and trading of financial derivatives are wasteful—indeed, both provide many benefits to society. While derivatives may not directly create wealth, they meet investor needs by reducing risk (Becketti). Moreover, derivatives allow firms to operate internationally without exposing themselves to undue risk from exchange rate changes. Therefore, it is not surprising that these new

instruments are valued highly. Furthermore, there is little evidence that on balance too many resources are devoted to creating and trading financial derivatives.

Moreover, say opponents, the STT advocates have only asserted the benefits of derivatives do not justify the cost—they have not proven their assertion. It would be helpful if the proponents could point to specifics rather than to generalities. The presumption in market economies is that if a firm is willing to pay for a product—such as an exotic derivative to hedge its foreign exchange risk—then the product is worth the amount the firm is willing to pay. Kiefer, in writing for the Congressional Research Service of the Library of Congress, gave shape to this idea:

> Such a standard would be inherently judgmental. …If some measure other than value determined in the market is to be used as the measure of "social value," then it is not clear what that measure is. Such an approach would have broad implications and could result in labeling many activities as economically wasteful. Does the "social value" of theme parks equal their cost, for example? What about luxury homes and automobiles? First-class airline and hotel accommodations? Pet rocks? (p. CRS-24).

Harmful side effects

In the eyes of opponents, not only are the STT benefits overestimated, but an STT would have harmful side effects. For example, an STT would penalize all investors, not just short-term traders, noise traders, or speculators. In addition, the cost of capital could actually rise, reducing investment—the opposite of the effect claimed by advocates.

STT penalizes all investors. Even though an STT is a tax on rapid turnover, all investors would indirectly feel its effects. An STT increases the bid/asked spread. That is, all traders—not just short-term traders—pay more each time they trade. In addition, although most households are not short-term traders, the mutual funds that people use as

a vehicle for saving would be adversely affected by an STT. Furthermore, since stock prices are likely to fall following the adoption of an STT, everyone who owns stocks would feel its effects.

All investors would be penalized by an STT because all must pay the bid/asked spread. Dealers profit by selling securities at a higher price than they bought them. The price a dealer is willing to pay is called the "bid" price, and the price a dealer is willing to accept is called the "asked" price. Therefore, by setting the asked price greater than the bid price, a dealer makes money. If an investor buys and immediately sells a security, he has to pay the difference, or spread, between the bid and asked price.

Since an STT increases the operating and hedging costs of dealers, an STT would increase the bid/asked spread paid by all investors. By increasing the bid/asked spread when their costs rise, dealers can continue to operate and cover their costs. The bid/asked spread depends on the number of trades over which dealers can spread their fixed costs, such as a seat on the New York Stock Exchange. But since an STT would reduce the volume of trading, dealers would have fewer trades over which to allocate their fixed costs; thus, the bid/asked spread would rise. The bid/asked spread also depends on the cost of hedging risk. Dealers hold an inventory of securities which are vulnerable to price changes. Dealers manage their risky inventory positions by using derivatives such as futures and options (Schwert and Seguin, p. 32). If the STT is imposed on futures and options, then the cost of managing a dealer's risky inventory would rise, causing the bid/asked spread to rise.

An STT would also penalize anyone who owns shares in a mutual fund. Approximately 27 percent of U.S. households in 1992 held shares in mutual funds.[6] The average mutual fund shareholder is 46 years old and earns $50,000 per year. While individuals seldom make trades themselves, their mutual funds trade frequently. For example, the average holding period for their

securities ranges from two months for the Strong Municipal Bond fund to 4.8 years for the Vanguard Windsor fund (Lo and Heaton, p. 10). Since the tax is paid each time a security turns over, an STT could significantly reduce returns from investing in mutual funds.

Another way that everyone would pay an STT is that stock prices would fall after an STT is imposed. Hubbard (p. 23) estimated that a 0.5 percent STT on stock prices would cause them to decline 2.3 to 5 percent. The reason for such a decline is that the price of a security depends on the current and future stream of income. If an investor chooses to sell the security at a later date, he must take into account the tax he must pay when selling the security. Furthermore, the price at which he can sell the stock will be reduced because the next investor will also take into account the tax she must pay when selling the security. Each investor must take into account the tax paid on all future sales.[7] Since the average holding period on the New York Stock Exchange is two years, an STT would have to be paid every other year.[8]

In Sweden, stock prices fell following the announcement of an STT. Umlauf (p. 231) reported that stock prices fell 2.2 percent on October 24, 1993, the day the initial tax was announced, and fell an additional 0.8 percent on March 11, 1986, the day an increase in the tax rate was announced. These declines probably reflect only part of the full effect of the tax, since the tax was anticipated. During the month before the official announcement of the tax, stock prices fell 5.3 percent.

STT and the cost of capital. Another harmful side effect of an STT would be an increase in the cost of capital. With falling stock prices, it would be more costly for firms to raise capital through issuing stock. Under reasonable assumptions, an STT could raise the cost of equity capital by as much as 70 basis points.[9]

Such an increase in the cost of capital would reduce the amount of business fixed investment. McCauley and Zimmer reported that in 1988 the cost of capital for equipment and machinery with a life of 20 years was 11.2 percent for the United States, 7.2 percent for Japan, 7.0 percent for Germany, and 9.2 percent for the United Kingdom. An increase in the cost of capital would make it more expensive to raise funds in the stock market. As a result, there would be fewer investment projects that could justify such a high cost of capital, ultimately lowering productivity and living standards.

Ineffective tax

The final argument against imposing a tax on securities transactions is that such a tax would likely be ineffective. The tax could be avoided and would be difficult to administer. As a result, its effects on raising revenue are probably overestimated.

Avoiding STT. According to opponents, an STT would be easy to avoid. In designing tax policy, it is important to remember that investors will always try to avoid taxes. Judge Learned Hand, writing in 1934, put it this way:

> Anyone may so arrange his affairs that his taxes shall be as low as possible; he is not bound to choose that pattern which will best pay the Treasury; there is not even a patriotic duty to increase one's taxes.[10]

By advocating a broad-based tax, proponents of an STT have attempted to meet the first rule of tax policy: tax products that have few substitutes. When a good is taxed, there is an incentive to buy close substitutes that are not taxed. For example, a tax on navel oranges would not be good tax policy because it could be avoided by switching to juice oranges, orange juice, or apples. It is for this reason that a broad-based tax is generally preferred to a narrow tax.

However, individuals could avoid even a broad-based STT by changing what and where they trade. Investors could change what they trade by switching, to the extent possible, from securities that are taxed to securities that are not taxed. They could also switch from securities that are highly taxed to those that are lightly taxed. Furthermore,

it is likely that financial firms would design new securities that are exempt from the STT. Given that the tax would be a large share of the transaction costs of participating in financial markets, there would be an incentive to introduce securities that are not taxable.

Avoidance of such a tax is not just a theoretical possibility, it has happened before. Many past financial innovations appear to be the market's response to government regulations. For example, Hester studied seven major innovations in the 1960s and 1970s, and concluded that "the innovations reduced distortions that arose from interest rate ceilings, reserve requirements, and other regulations" (p. 167). Rowe argued that much of the growth in the commercial paper market in the 1960s and 1970s was due to Regulation Q ceilings on interest rates. Finally, in discussing the incentives for development of the Eurodollar market, Goodfriend noted that banks could avoid regulations by using the Eurodollar market.

Not only might investors change what they trade, they might also change where they trade. Small investors may find it difficult to move to foreign markets, but large institutional investors can easily make that move. It is even easier for foreign investors to move to foreign markets.

Again, the Swedish experience is instructive. Their tax was 1 percent beginning in 1984 and 2 percent beginning on July 1, 1986. Following the tax hike, 30 percent of the trading volume of Swedish stocks moved to London. By 1990, 50 percent of the trading of Swedish stocks had moved to London (Umlauf, pp. 229-230). In addition, the Swedish market for interest rate options disappeared following the imposition of an STT.

In the United States it would be easy to escape the tax by trading U.S. securities in London, where large amounts of U.S. stocks are already traded. To counteract this response, the tax could be imposed on U.S. investors who trade U.S. securities in other countries. However, investors might then choose to invest in foreign securities that are close substitutes for U.S. securities. Moreover,

foreign markets could create synthetic securities that mimic the S&P 500 or other U.S. securities.

For similar reasons, taxing futures transactions could put the U.S. futures market at a significant disadvantage. Edwards (p. 83) estimated that a 0.5 percent tax applied to the notional value of a stock index futures contract would increase transaction costs for a round-trip trade in the futures market by 2,200 percent. By increasing transaction costs so much, many investors might switch to foreign futures markets. And since futures markets throughout the world are characterized by low transaction costs, the incentive to switch to foreign markets could be great. Moreover, this is not an idle concern, as U.S. futures markets compete head-to-head with foreign futures markets. For example, eight of the top ten U.S. futures contracts are also traded on foreign markets (Edwards, pp. 85-86). And these eight contracts are large. According to Edwards, if half of the annual trading in those eight futures contracts moved to foreign markets, the volume on U.S. futures markets would decline by one-third.

Overestimating revenue. An STT would unquestionably raise some revenue, but the amount might be less than expected. The overestimates arise because the tax base would decline as security prices and the volume of trading decline. Trading volume would decline for three reasons: a tax induces investors to trade less often, some trading would move abroad, and new securities not subject to the tax would be introduced. Hubbard (p. 989) conservatively estimated that an STT on stock transactions could reduce trading volume by 25 percent. Furthermore, an STT on futures transactions could reduce trading volume by 88 percent (Hubbard, p. 992). In Sweden, the Finance Ministry initially estimated revenues at 1,500 million Swedish kronor (SEK) per year. In contrast, the realized revenue averaged only SEK 50 million per year, with a maximum of SEK 80 million in 1989 (Froot and Campbell, p. 18).

STT opponents also point out other significant

costs. For example, the cost of implementing, administering, and ensuring compliance could be significant. In addition, the cost spent to avoid the tax must be taken into account. Lawyers and financial analysts would devote considerable time and energy to designing new securities to avoid the tax. Since this is solely a result of the tax, it should be considered another cost of the tax. Given the salaries of lawyers and financial analysts, this cost could also be significant. After taking account of these costs and the likely avoidance, the net revenue gained from an STT might fall far short of the $58 billion estimated by the Congressional Budget Office.

CONCLUSIONS

The case for an STT has not been proven. The benefits of the tax do not necessarily exceed the cost. While the proponents have identified several possible benefits, serious questions remain about whether the benefits would be achieved. As Richard Darman, the Director of the Office of Management and Budget during the Bush Administration, stated: "[An STT] has no evident justification. It could cause distortions in the financial markets and could cause many investors, particularly institutions, to shift their equity trading away from organized exchanges and to foreign countries" (Grundfest and Shoven, p. 441).

An STT will not necessarily reduce volatility. Advocates argue an STT would reduce volatility by eliminating noise trading, which adds volatility to the market. Opponents argue an STT could just as easily raise volatility. Opponents also point to the Swedish experience and to econometric evidence, both of which show little effect of an STT on volatility.

There is no clear evidence that too many resources are wasted on financial analysis. Advocates claim that too many resources are spent on trading claims to financial assets, rather than on creating wealth. Opponents, on the other hand, believe that by creating and trading financial derivatives, financial markets provide important benefits to society.

While an STT would raise needed revenues, the revenue gains may be overestimated. Advocates argue that even if an STT had no benefits, the tax could be useful because the $58 billion it might raise in the first five years could be used to reduce the government's large budget deficit. However, opponents point out that since investors will try to avoid the tax, the revenue gains could be substantially less than what proponents estimate.

In addition to disputing the benefits of an STT, opponents believe that the tax has several harmful side effects. It would penalize all investors—not just short-term traders, noise traders, or financial analysts. Furthermore, the cost of capital would likely rise, reducing the amount of investment.

Furthermore, if the tax is such a good idea, why are many countries reducing or eliminating their taxes? Sweden, Finland, and Taiwan have recently reduced or eliminated their taxes, while Australia, Japan, and the U.K. are considering reductions in their taxes (Froot and Campbell, p. 1).

Finally, London is one of the biggest backers of a U.S. transaction tax. The London financial press believes that a U.S. tax would be good for business in London. In a story about a U.S. STT, a London *Financial Times* headline read "City Sees Advantages in U.S. Levy on Volume." The story goes on to say that "if the U.S. administration decides to go ahead with a securities turnover tax, it will have strong support in the City of London" Grundfest, p. A10). Obviously, London believes that it will get some additional business if the United States adopts an STT.

Given the doubts and uncertainties, the burden of proof for adopting an STT remains with the advocates. As yet, the case for an STT has not been proven.

APPENDIX

THE RELATION BETWEEN HOLDING PERIOD AND RETURN

In all examples, assume a $100 invest-ment, no inflation, and that investors demand a real after-tax rate of return of 4 percent.

No taxes.

With a 4 percent real rate of return, a $100 investment yields $104.

A 0.5 percent tax and one-day holding period.

An interest rate of 286.71 percent (at an annual rate) yields a 4 percent after-tax rate of return. A 286.71 percent annual return equals a 0.5176 percent return over one week. A $100 investment yields $100.5176 in one week (= $100 * 1.005176). The tax is $0.50259 (= 0.005*$100.5176), so the after-tax return is $100.015. Therefore, the annual-ized after-tax rate of return is 4 percent (= [($100.015/$100)^{262} - 1] * 100 = 4 percent).

A 0.5 percent tax and a five-year holding period.

An interest rate of 4.1 percent yields a 4 percent after-tax rate of return. A 4.1 percent annual return yields $122.28 after 5 years. The tax is $0.61 (= 0.005*$122.28), so the after-tax return in $121.67. Therefore, the average annual after-tax rate of return is 4.0 percent (= [($121.67/$100)$^{(1/5)}$ - 1] * 100 = 4 percent).

A general formula.

The general formula is now easy to state. Let i be the interest rate, expressed at an annual rate, and let τ be the tax rate. Let h be the holding period, defined so that $h = 52$ means a one-week holding period and $h = 0.2$ means a five-year holding period. Then, assuming a 4 percent after-tax rate of return is required, the following arbitrage condition must hold:

$$[(1 + i)(1 - \tau)^h - 1] = .04 .$$

Therefore, the before-tax rate of return is given by:

$$i = \left[\frac{1.04}{(1 - \tau)^h} - 1 \right] \times 100 .$$

ENDNOTES

[1] Hubbard gives a brief discussion of the history of securities transaction taxes in the United States.

[2] Engel and Morris discuss the benefits and characteristics of efficient markets.

[3] In addition, Becketti and Sellon show that normal volatility in the stock market has been relatively constant from 1920 to 1988. In contrast to normal volatility, the frequency of large one-day price changes was much higher in 1985-87 than in previous periods. They also show that interest rate volatility increased in the early 1980s. Volatility of short-term rates has since declined, but volatility of long-term rates has remained high.

[4] The rank correlation statistic is Fisher's exact test. A typical correlation coefficient measures the association between the value of the tax rate and average price change. The rank correlation coefficient measures the association between the rank of the tax rate and the rank of the average price change. The p-value is 0.85.

[5] However, the results are not unambiguous. For example, the ratio of weekly to daily volatility declines, suggesting that taxes may reduce the effect of traders that simply follow trends in the stock market.

[6] All figures come from the *Mutual Fund Fact Book*.

[7] Thus, there are two opposing forces on stock prices. The direct effect of the tax is to make stock prices fall. However, if volatility falls, the fall in risk would make stock prices rise, offsetting the fall in prices. Which effect dominates? If volatility is unaffected, the direct effect dominates and prices fall. If volatility falls, the direct and indirect effects offset each other and prices could rise or fall. However, evidence cited earlier suggests that the relation between volatility and transaction taxes is weak, at best. Therefore, the direct effect is likely to dominate and so prices are likely to fall.

[8] While not everyone holds stocks, many do. Based on the 1989 Survey of Consumer Finances, Heaton and Lo (Table 13) report that 15 percent of households earning less than $30,000 held stock, 46 percent of households earning between $30,000 and $100,000 held stock, and almost 80 percent of households earning more than $100,000 held stock.

[9] The price-earnings ratio is approximately 11.7, implying a required role of return of 8.55 percent. Assuming the corporate tax rate is about 36 percent, the cost of capital is 13.36 percent. If prices fell 5 percent, the price-earnings ratio would fall to 11.15, the required rate of return would rise to 9 percent, and the cost of capital would rise to 14.06 percent. Therefore, the cost of capital rises from 13.36 percent to 14.06 percent, an increase of 70 basis points.

[10] *Helvering v. Gregory*, 69 F.2d 809, 810 (2d Cir. 1934), *Aff d.* 293 U.S. 465 (1935), as quoted in Grundfest and Shoven, p. 423.

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