

MERCATUS
RESEARCH

SECURITIES TRANSACTION TAXES AND MARKET
QUALITY OF EQUITY AND FUTURES MARKETS
Issues and Evidence

George H. K. Wang



Bridging the gap between academic ideas and real-world problems

ABOUT THE MERCATUS CENTER AT GEORGE MASON UNIVERSITY

THE MERCATUS CENTER at George Mason University is the world's premier university source for market-oriented ideas—bridging the gap between academic ideas and real-world problems.

A university-based research center, Mercatus advances knowledge about how markets work to improve people's lives by training graduate students, conducting research, and applying economics to offer solutions to society's most pressing problems.

Our mission is to generate knowledge and understanding of the institutions that affect the freedom to prosper and to find sustainable solutions that overcome the barriers preventing individuals from living free, prosperous, and peaceful lives.

Founded in 1980, the Mercatus Center is located on George Mason University's Arlington campus.

www.mercatus.org

Copyright © 2014 by George H. K. Wang
and the Mercatus Center at George Mason University

Mercatus Center at George Mason University
3434 Washington Boulevard, 4th Floor
Arlington, VA 22201
(703) 993-4930
mercatus.org

Release date: March 26, 2014

ABOUT THE AUTHOR

GEORGE H. K. WANG is research professor of finance in the School of Management at George Mason University. He received his PhD in statistics and economics (a double major) from Iowa State University. He was the deputy chief economist and director of research for the US Commodity Futures Trading Commission from 1999 to 2006. Wang also served as a visiting professor of finance on the Faculty of Economics and Business at the University of Sydney, Australia, in the summers of 2006 and 2007 and in January 2014; a visiting professor at the Capital Markets Cooperative Research Centre in Sydney, Australia, in 2010; and a visiting professor of finance in the College of Management at National Central University, Jhongli, Taiwan, in the summer of 2007. He has published widely in major refereed journals on the subjects of derivative markets, applied time series, econometrics, mortgage markets, and transportation. Wang is an elected ordinary member of the International Statistical Institute and is on the editorial board of the *Journal of Futures Markets*.

ABSTRACT

THIS PAPER DISCUSSES arguments for and against a securities transaction tax (STT) and evaluates the pros and cons based on a review of empirical evidence concerning the impact of STTs on equity and futures markets (i.e., trading volume, bid-ask spreads, and price volatility) and market efficiency in various countries. I find that an STT would likely reduce trading volume and increase trading cost, but may not reduce price volatility. The size of potential STT revenue depends on the STT's impact on market activity. A sizable STT on futures and equity markets would not only fail to generate the expected tax revenue, it would also likely hurt the international competitiveness of US equity and futures markets.

JEL code: G10

Keywords: securities transaction tax, transaction tax, trading volume, bid-ask spread, price volatility, market efficiency, transaction tax revenue, futures and equity markets

IN REACTION TO the financial crisis and government budget deficits, some members of Congress have proposed a securities transaction tax (STT) as a way to raise revenue for financing the government budget deficit or for funding regulatory agencies such as the US Commodity Futures Trading Commission (CFTC) and the US Securities and Exchange Commission (SEC).¹ In general, proponents of an STT argue that it would increase government revenue and discourage short-term speculative trading, and hence, reduce price volatility. Opponents of an STT argue that it would increase the cost of capital and the cost of hedging and reduce market liquidity (i.e., cause increases in bid-ask spreads² and decreases in trading volume), but would not necessarily reduce price volatility.

In this paper, I discuss rationales for STTs and evaluate arguments for and against them. I review the empirical evidence of the impact of STTs on market quality (i.e., trading volume and cost, price volatility, and market price efficiency) in different countries. Finally, I evaluate alternative methods of estimating the potential revenue from an STT.

POTENTIAL BENEFITS OF A SECURITIES TRANSACTION TAX

PROponents of an STT often point to four major benefits: (1) reduced excess (short-term) speculation and price volatility, (2) reduced cost of capital, (3) increased emphasis on long-term investment results, and (4) increased tax revenue. These

1. Several American administrations and congresses have proposed STTs. During the fiscal year 1990 budget negotiations, the first Bush administration proposed a broad-based 0.5 percent tax on transactions in stocks, bonds, and exchange-traded derivatives. In 1993, the Clinton administration proposed a fixed 14-cent tax on transactions in futures and options on futures. In 2010, 28 members of the House of Representatives cosponsored legislation that would impose a transaction tax on regulated futures transactions; the proposed tax was 0.02 percent of the notional amount of each futures transaction, to be charged to each party to the transaction. Kathleen Cronin, "A Transaction Tax's Unintended Consequences" (comment, CME group, General Counsel Department, March 10, 2010).

2. The bid price is the amount a dealer is prepared to pay for an asset. The ask price (or offer price) is the price at which a dealer is offering to sell an asset. The bid-ask spread is the amount by which the ask price exceeds the bid price. It is usually used to measure the liquidity of an asset traded in the markets.

proponents of an STT include John Maynard Keynes, James Tobin, Joseph Stiglitz, Lawrence Summers, and Victoria Summers.

Reduced Excess Speculation and Price Volatility

Proponents of an STT distinguish between two types of traders in financial markets: value investors and noise traders. Value investors buy stocks when the market price is below the fundamental value, and they sell stocks when the market price is above the fundamental value. This value-based trading is assumed to reduce stock price volatility by pushing stock prices back toward estimates of the worth of the company. Conversely, short-term noise traders act on the basis of past price movements and seek to extract short-term gains over a long-term horizon. This type of trading may drive market prices away from estimates of fundamental values and create excess price volatility. In the literature, short-term noise traders are often referred to as small individual traders.³ Value investors are long-term investors who have no need to trade frequently. On the other hand, short-term speculative traders do need to trade frequently because their strategy is to follow recent price behavior. Because the trading frequency of short-term investors is much greater than that of long-term investors, the imposition of an STT would increase costs for short-term speculative traders but have less impact on the trading costs of long-term value investors. As a result, an STT would curb the frequency of short-term speculative trading and thus, theoretically, curb excess price volatility.⁴

Reduced Cost of Capital

Stock markets allow firms to raise new capital from shareholders by way of exchange. Proponents of an STT argue that it would enhance the capital-raising function of the stock market if the tax reduced stock market volatility. Reducing market volatility would make it easier for firms to raise equity at a lower required rate of return because the lower volatility would reduce the risk premium, thus increasing efficiency.⁵

3. J. Bradford DeLong et al., “Positive Feedback Investment Strategies and Destabilizing Rational Speculation,” *Journal of Finance* 45, no. 2 (1990): 379–95.

4. John Maynard Keynes, *The General Theory of Employment, Interest, and Money* (New York: Harcourt Brace, 1936); James E. Tobin, “A Proposal for International Monetary Reform,” *The Eastern Economic Journal* 4 (July–October 1978): 153–59; Lawrence H. Summers and Victoria P. Summers, “When Financial Markets Work Too Well: A Cautious Case for a Securities Transaction Tax,” *Journal of Financial Services Research* 3 (1989): 261–86; Joseph E. Stiglitz, “Using Tax Policy to Curb Speculative Short-Term Trading,” *Journal of Financial Services Research* 3 (1989): 101–15.

5. Stiglitz, “Using Tax Policy.”

Increased Emphasis on Long-Term Investment Results

Investors with short-term trading horizons have a preference for short-term appreciation because they hold stocks for only a fraction of a year. This focus has often induced portfolio managers to maximize performance in the near term. They give short-term prospects a disproportionate weight when determining stock purchases in order to meet the expectations of these short-term investors. As a consequence, corporate managers are forced to slight long-term investment in favor of delivering short-term earnings. Proponents of an STT argue that it would disproportionately discourage investors with short-term trading horizons because such traders would be taxed more frequently, thus increasing their trading costs. On the other hand, an STT would not affect the long-term investor as much because the transaction tax, on average, becomes smaller as the holding period increases. Thus, an STT would not have a significant effect on long-term investors. The imposition of an STT would reduce the number of active short-term investors and increase investors' average expected holding period. More market participants would, theoretically, look beyond quarterly earnings reports and a short-run prospective, resulting in more stable prices. Corporate managers would be free to pursue more long-term investment strategies, such as research and development and capital expansion.⁶

Increased Tax Revenue

STT proponents suggest that the revenue potential of a transaction tax is formidable. The Congressional Budget Office (CBO) estimates revenue from a broadly based 0.5 percent securities transaction tax to be about \$11.6 billion per year based on a five-year average.⁷ Using the same tax rate as CBO, Summers and Summers estimate government revenue of at least \$10 billion a year.⁸ Another estimate indicates that revenue from an STT could be as large as \$70 billion–\$100 billion a year.⁹ The Center for Economic and Policy Research estimated that revenue from an STT on equity and futures (based on the 2008 transaction volume) would be \$230.9 billion annually for the pre-tax 2008 trading volume, \$173.2 billion with an assumed reduction of 25 percent of 2008 transaction volume, and \$115.4 billion based on a

6. Ibid.

7. Congressional Budget Office, *Reducing the Deficit: Spending and Revenue Options* (Washington, DC: US Government Printing Office, 1990).

8. Summers and Summers, "When Financial Markets Work Too Well."

9. Robert Pollin, Dean Baker, and Marc Schaberg, "Securities Transaction Taxes for U.S. Financial Markets," *Eastern Economic Journal* 29, no. 4 (2003): 527–58.

50 percent reduction of 2008 trading volume, respectively.¹⁰ These estimates suffer from one of two major weaknesses: in calculating potential tax revenue from an STT, they either use the pre-tax trading volume or do not evaluate trading volume elasticity with respect to trading costs at all.¹¹ Without accurately assessing the effects of an STT on trading volume, it is difficult to determine the amount of revenue from such a tax.

POTENTIAL COSTS OF A SECURITIES TRANSACTION TAX

NOT EVERYONE BELIEVES that an STT would have a beneficial effect on equity and futures markets. Opponents of an STT claim that there are very real potential costs: (1) reduced trading volume, market liquidity, and information efficiency; (2) ambiguous impact on price volatility; (3) increased costs of capital and hedging; and (4) migration of trading volume and international competitiveness.

Reduced Trading Volume, Market Liquidity, and Information Efficiency

Previous literature suggests that there is a negative relationship between trading volume and trading costs.¹² An increase in trading costs due to an STT would lower the profitability of trading, leading traders to trade less frequently or to extend their holding period in order to minimize their trading costs over time. With a reduction in trading volume, traders would take more time to offset their trades and bid-ask spreads would increase, thus diminishing market liquidity. Andrew Lo and his colleagues propose a dynamic equilibrium model of asset prices and trading volume that shows a small fixed transaction cost significantly reduces trading volume.¹³ Franklin Edwards argues that transaction taxes increase trading costs, making US futures markets less competitive because of the impact on price efficiency and on the cost of hedging.¹⁴ He argues that a tax-induced reduction in trading may also decrease information efficiency by discouraging “information” trades by informed speculators and hedgers. Edwards acknowledges the difficulty

10. Dean Baker et al., *The Potential Revenue from Financial Transactions Taxes* (Washington, DC: Center for Economic and Policy Research, 2009). The assumed 25 percent and 50 percent reductions in trading volume due to the introduction of an STT are used to indicate the negative relationship between trading volume and trading cost. However, the authors do not explain the rationale for choosing these two particular numbers for their assumptions. Therefore, it is difficult to evaluate the reliability of these estimates.

11. Elasticity is a measure of the percentage change in one variable resulting from a 1 percent increase in the other variable.

12. George H. K. Wang and Jot Yau, “Trading Volume, Bid-Ask Spread, and Price Volatility in Futures Markets,” *Journal of Futures Markets* 20, no. 10 (2000): 943–70.

13. Andrew W. Lo, Harry Mamaysky, and Jiang Wang, “Asset Prices and Trading Volume under Fixed Transactions Costs,” *Journal of Political Economy* 112, no. 5 (2004): 1054–90.

14. Franklin R. Edwards, “Taxing Transactions in Futures Markets: Objectives and Effects,” *Journal of Financial Services Research* 7 (1992): 75–93.

of determining the net impact on price efficiency because the STT also discourages noise trading.

In short, when a market is illiquid due to higher trading costs, information is more slowly incorporated into equity or futures prices, thus impairing the overall market information efficiency. The efficient allocation of resources in our economy is guided by market prices. Therefore, overall market price movements that reflect updated market information play an important role in planning the allocation of resources in our economy.

Ambiguous Impact on Price Volatility

Price volatility refers to the variability of prices in the equity and futures markets. Price volatility can be decomposed into two components: (1) price changes due to new information and (2) price changes due to trading by itself. The price volatility caused by new information is a good volatility because we prefer prices to reflect the new information in the markets. Price volatility caused by excessive speculative noise trading is often referred to as bad volatility because price changes in this case do not necessarily reflect changes in the fundamental values of the asset prices. Donald Kiefer argues that a transaction tax can theoretically increase or decrease price volatility because an STT would affect both informed traders and speculative noise traders. The net effects are not easily determined.¹⁵ Paul Kupiec agrees that a transaction tax has ambiguous effects on price volatility in a general equilibrium model framework.¹⁶ In the context of his model, Kupiec shows that a transaction tax can reduce the price volatility if accompanied by the fall of the taxed asset's price, while conversely, the volatility of risky asset returns would increase with the transaction tax. Thus the net effect of an STT could be to increase price volatility, decrease it, or leave it unchanged, depending on other factors in the scenario.

Frank Song and Junxi Zhang examine both the effects of a transaction tax on a set of noise traders and the resulting market volatility.¹⁷ They show that a transaction tax might discourage trading not only by noise traders but also by rational and stabilizing value investors. The net effect of an STT on volatility depends on the change of trader composition that results from the implementation of the tax. Intraday volatility reflects changes in market liquidity and information effects. A transaction tax may also decrease trading volume and increase bid-ask spread. This potential effect of a transaction tax on liquidity is called the liquidity effect. The net impact of a

15. Donald W. Kiefer, "The Securities Transaction Tax: An Overview of the Issues," CRS Report for Congress, Congressional Research Service, Library of Congress, 1990.

16. Paul H. Kupiec, "Noise Traders, Excess Volatility, and a Securities Transactions Tax," *Journal of Financial Services Research* 10 (1996): 115–29.

17. Frank M. Song and Junxi Zhang, "Securities Transaction Tax and Market Volatility," *Economic Journal* 115 (2005): 1103–20.

transaction tax could either decrease or increase market price volatility. The final results depend on the relative magnitude and interaction of trader composition and market liquidity. In short, the implications of theoretical models on the price volatility effect of an STT are mixed. Their conclusions depend on the assumptions of the theoretical models and the mechanisms of information transmission.

Increased Costs of Capital and Hedging

The imposition of a transaction tax would increase the trading costs on stocks; investors would therefore demand a higher expected return commensurate with the added trading cost. As a consequence, firms' cost of equity would rise and their stock prices would decrease. Opponents of an STT also argue that a decline in trading volume due to an STT would likely increase risk premiums that hedgers would have to pay speculators who provide liquidity. This situation would make futures less efficient risk-management instruments, thus undermining hedging activity, which is one of the primary economic functions of futures markets.¹⁸

Migration of Trading Volume and International Competitiveness

An increase in trading costs due to the imposition of an STT could cause many investors—particularly institutions—to shift their equity trading from organized domestic exchanges to foreign countries in order to minimize trading costs. A critical feature of futures markets across the globe is their lower transaction costs. If US futures markets have higher trading costs due to an STT, it would be a relatively simple matter to shift trading to foreign markets for two reasons: (1) some foreign exchanges are trading futures contracts similar to those traded in the US futures exchanges in order to compete for the same business; and (2) there are no restrictions on Americans shifting their trades to foreign exchanges.

EMPIRICAL EVIDENCE

I NOW PROCEED to review empirical evidence concerning the impact of an STT on the market quality (i.e., trading volume, market liquidity, price volatility, and price efficiency) of stock and futures markets in different countries. Table 1 summarizes the empirical evidence of the impact of an STT on market quality as reported by those papers that are reviewed in the following section.

18. Edwards, "Taxing Transactions in Futures Markets."

TABLE 1. EMPIRICAL EVIDENCE OF THE IMPACT OF AN STT ON MARKET QUALITY IN DIFFERENT COUNTRIES

Study	Country	Tax type	Tax rate	Market	Price volatility	Market liquidity	Trading volume	Information efficiency
Roll (1989)	23 countries	STT	Different levels of positive tax rates and zero tax rate	Stock	Increase on rise	–	–	–
Umlauf (1993)	Sweden	STT	Increase	Stock	Increase*	–	Decrease*	–
Hu (1998)	Hong Kong	STT	Increase/decrease	Stock	No effect	–	No effect	–
	Japan	STT	Increase/decrease	Stock	No effect	–	No effect	
	South Korea	STT	Increase/decrease	Stock	No effect	–	No effect	
	Taiwan	STT	Increase/decrease	Stock	No effect	–	No effect	
Chou and Lee (2002)	Taiwan	Futures	Decrease	Futures	–	–	–	Increase
Chou and Wang (2006)	Taiwan	STT	Decrease	Futures	No effect	Increase*	Increase*	–
Baltagi et al. (2006)	China	STT	Increase	Stock	Increase*	–	Decrease*	Decrease
Liu (2007)	Japan	STT	Decrease	Stock	–	–	–	Increase
Liu and Zhu (2009)	Japan	FCD	Decrease	Stock	Increase*	–	–	–
Haferkorn and Zimmermann (2013)	France	STT	Increase	Stock	Increase*	Decrease*	Decrease*	–

* Denotes statistical significance at least at the 5 percent level.

Notes: "–" Denotes a market quality that was not considered in the study. STT = securities transaction tax; FCD = fixed commission deregulation. The 23 countries covered in the Roll study are Australia, Austria, Belgium, Canada, Denmark, France, Germany, Hong Kong, Ireland, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Singapore, South Africa, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

Sources: Richard Roll, "Price Volatility, International Market Links and Their Implications for Regulatory Policies," *Journal of Financial Services Research* 3 (1989): 211–46; Steven R. Umlauf, "Transaction Taxes and the Behavior of the Swedish Stock Market," *Journal of Financial Economics* 33, no. 2 (1993): 227–40; Shing-yang Hu, "The Effects of the Stock Transaction Tax on the Stock Market—Experiences from Asian Markets," *Pacific-Basin Finance Journal* 6 (1998): 347–64; Robin K. Chou and Jie-Haun Lee, "The Relative Efficiencies of Price Execution between the Singapore Exchange and the Taiwan Futures Exchange," *Journal of Futures Markets* 22, no. 2 (2002): 173–96; Robin K. Chou and George H. K. Wang, "Transaction Tax and Market Quality of the Taiwan Stock Index Futures," *Journal of Futures Markets* 26, no. 12 (2006): 1195–216; Badi H. Baltagi, Dong Li, and Qi Li, "Transaction Tax and Stock Market Behavior: Evidence from an Emerging Market," *Empirical Economics* 31 (2006): 393–408; Shinhua Liu, "Securities Transaction Tax and Market Efficiency: Evidence from the Japanese Experience," *Journal of Financial Services Research* 32, no. 3 (2007): 161–76; Shinhua Liu and Zhen Zhu, "Transaction Costs and Price Volatility: New Evidence from the Tokyo Stock Exchange," *Journal of Financial Services Research* 36, no. 1 (2009): 65–83; Martin Haferkorn and Kai Zimmermann, "Securities Transaction Tax and Market Quality—The Case of France" (working paper, Goethe University Frankfurt, 2013).

Effects on Trading Volume and Market Liquidity

Previous theoretical studies find that transaction costs and trading volume have a negative relationship. Empirical studies also find that an STT has a negative effect on trading volume. Steven Umlauf documents that 60 percent of the trading volume of the 11 most actively traded Swedish share classes, amounting to 30 percent of total trading volume, shifted from Sweden to the London stock exchange when the Swedish transaction tax on equity increased from 1 percent to 2 percent in 1986.¹⁹ Shing-yang Hu examines the effects of 14 transaction tax changes in Hong Kong, Japan, South Korea, and Taiwan during the period 1975–94. He finds that in most cases, trading volume decreased after the tax rate increased in these four countries, although the decreases in trading volume are statistically significant in only half of these cases.²⁰

Robin Chou and I find that the trading volume in Taiwan Index Futures contracts increased significantly and a significant reduction in bid-ask spreads occurred after the Taiwanese government reduced the tax levied on futures transactions in the futures exchange from 5 to 2.5 basis points in 2000.²¹ Badi Baltagi and his colleagues document that trading volume was significantly reduced after an increase in the transaction tax rate on May 10, 1997, in China.²² Martin Haferkorn and Kai Zimmermann find that trading demand significantly dropped in the French stock market after the French implemented an STT in 2012.²³ They also find an increased spread level and a strong decline in top order book depth.

In sum, most empirical evidence supports the hypothesis that an STT has negative impacts on trading volume and market liquidity.

Effects on Price Volatility

In a study of longitudinal data from 23 countries for the period up to, during, and after the 1987 market crash, Richard Roll finds no statistically significant evidence that price volatility is negatively related to transaction taxes.²⁴ The same results—no effect on volatility—are also documented by Hu, who examines the effects of an

19. Steven R. Umlauf, “Transaction Taxes and the Behavior of the Swedish Stock Market,” *Journal of Financial Economics* 33, no. 2 (1993): 227–40.

20. Shing-yang Hu, “The Effects of the Stock Transaction Tax on the Stock Market: Experiences from Asian Markets,” *Pacific-Basin Finance Journal* 6 (1998): 347–64.

21. Robin K. Chou and George H. K. Wang, “Transaction Tax and Market Quality of the Taiwan Stock Index Futures,” *Journal of Futures Markets* 26, no. 12 (2006): 1195–216.

22. Badi H. Baltagi, Dong Li, and Qi Li, “Transaction Tax and Stock Market Behavior: Evidence from an Emerging Market,” *Empirical Economics* 31 (2006): 393–408.

23. Martin Haferkorn and Kai Zimmermann, “Securities Transaction Tax and Market Quality: The Case of France” (working paper, Goethe University Frankfurt, 2013).

24. Richard Roll, “Price Volatility, International Market Links and Their Implications for Regulatory Policies,” *Journal of Financial Services Research* 3 (1989): 211–46.

STT in four Asian countries.²⁵ Chou and I also observe that there is no effect on volatility after a decrease in transaction tax on futures markets in Taiwan.²⁶ According to the study conducted by Haferkorn and Zimmermann, the introduction of an STT on the French stock market in 2012 actually increased price volatility.²⁷ Umlauf also finds evidence of increased price volatility with the introduction of an STT in Sweden, while Baltagi and his colleagues find the same with the introduction of an STT in China.²⁸

Since STTs and brokerage commission rates both constitute trading costs, researchers sometimes use the impact of a change in brokerage commission rates as a proxy for the impact of an STT on market volatility. For example, Shinhua Liu and Zhen Zhu investigate the volatility impacts of the full commission deregulation in Japan in October 1999.²⁹ Brokerage commission rates in Japan had remained fixed until April 1, 1994. Between April 1, 1994, and September 20, 1999, brokers could negotiate with customers the commission rates on the portion of trade over ¥1 billion while the commission rates for the portion up to ¥1 billion remained fixed by the exchange. The final phase of deregulation came into effect on October 1, 1999. Since then, brokerage commission rates became negotiable on all transactions in order to enhance the global competitiveness of the Japanese stock market. Liu and Zhu find that the deregulation tends to increase price volatility in the Japanese equity market.

Overall, most of the previous empirical evidence does not support the theory that an STT is an effective regulatory policy tool to reduce price volatility.

Effects on Information Efficiency and Price Discovery

Robin Chou and Jie-Haun Lee provide evidence that, after the transaction tax in Taiwan was reduced in 1986, the Taiwan Futures Exchange (TAIFEX) assumed a leading role over the Singapore Stock Exchange (SGX) in the price discovery process in Taiwan index futures contracts.³⁰ This result demonstrated that the information advantage of the SGX diminished as the TAIFEX lowered its transaction tax. Baltagi and his colleagues find that volatility shocks were not quickly incorporated into stock prices after China increased its STT in the Shanghai and Shenzhen

25. Hu, "Effects of the Stock Transaction Tax on the Stock Market."

26. Chou and Wang, "Transaction Tax and Market Quality of the Taiwan Stock Index Futures."

27. Haferkorn and Zimmermann, "Securities Transaction Tax and Market Quality."

28. Umlauf, "Transaction Taxes and the Behavior of the Swedish Stock Market"; Baltagi, Li, and Li, "Transaction Tax and Stock Market Behavior."

29. Shinhua Liu and Zhen Zhu, "Transaction Costs and Price Volatility: New Evidence from the Tokyo Stock Exchange," *Journal of Financial Services Research* 36, no. 1 (2009): 65–83.

30. Robin K. Chou and Jie-Haun Lee, "The Relative Efficiencies of Price Execution between the Singapore Exchange and the Taiwan Futures Exchange," *Journal of Futures Markets* 22, no. 2 (2002): 173–96.

exchanges.³¹ Similarly to Chou and Lee, Liu shows that Japanese stock price changes have reflected new information quickly since the STT reduction in 1989, implying an improvement in the efficiency of the price discovery process.³²

ESTIMATION OF POTENTIAL REVENUE FROM A SECURITIES TRANSACTION TAX

PROponents of an STT often employ a simple method to calculate transaction tax revenue, multiplying the tax rate by the pre-tax aggregate trading volume in the given market, thus assuming a static model. One such example is the potential STT revenue estimated by the Center for Economic Policy Research in 2009.³³ This method can vastly overestimate the potential tax revenue because it does not take into account any negative relationship between transaction costs and trading volume. Yet previous studies provide evidence that trading volume would decline in response to increased tax-induced trading costs.³⁴ Reliable estimates of tax revenue need to be based on reliable estimates of post-tax trading volume. In turn, an estimation of post-tax trading volume requires two inputs: (1) the elasticity of the trading volume with respect to trading costs and (2) the percentage increase in trading costs due to the STT.³⁵ Either high elasticity or a high percentage increase in trading costs can substantially reduce trading volume. Thus, an STT may only raise a modest amount of tax revenue, much smaller than expected. For example, the post-tax trading volume of a futures contract with higher elasticity would decline more than the trading volume of a futures contract with lower elasticity.

C. Johan Bjursell and his colleagues provide updated estimates of the elasticity of the trading volume with respect to trading costs on 11 selected US futures contracts and estimates of potential tax revenue under alternative tax rates.³⁶ They provide evidence that, under the proposed tax rate of 0.02 percent of the notional value of futures contracts, the simple method substantially overestimates the transaction tax revenue. For example, they find that, given an elasticity of -0.87 of 30-year T-bond futures, the potential tax revenue would be about 65 percent less

31. Baltagi, Li, and Li, "Transaction Tax and Stock Market Behavior."

32. Shinhua Liu, "Securities Transaction Tax and Market Efficiency: Evidence from the Japanese Experience," *Journal of Financial Services Research* 32, no. 3 (2007): 161–76.

33. Baker et al., *Potential Revenue from Financial Transactions Taxes*.

34. Umlauf, "Transaction Taxes and the Behavior of the Swedish Stock Market"; Hu, "Effects of the Stock Transaction Tax on the Stock Market"; Baltagi, Li, and Li, "Transaction Tax and Stock Market Behavior"; C. Johan Bjursell, George H. K. Wang, and Jot Yau, "Transaction Tax and Market Quality of U.S. Futures Exchanges: An Ex-Ante Analysis," *Review of Futures Markets* 20 (2012): 141–77; Haferkorn and Zimmermann, "Securities Transaction Tax and Market Quality."

35. See tables 14 and 15 in Bjursell, Wang, and Yau, "Transaction Tax and Market Quality of U.S. Futures Exchanges."

36. Bjursell, Wang, and Yau, "Transaction Tax and Market Quality of U.S. Futures Exchanges."

than the estimates generated by the simple method.³⁷ The post-tax trading volume of the S&P 500 reaches zero when the transaction tax is 383.76 percent of the total fixed transaction cost, given an elasticity of -0.81 .³⁸ Bjursell and his colleagues also find that the elasticity of agricultural futures in general is less than the elasticity of financial futures. These results suggest that participants in the agricultural market would have a larger burden than the users of financial futures. In sum, the more reliable estimates of potential tax revenues depend on reliable estimates of post-tax trading volume.

CONCLUSIONS

PROponents of an STT argue that such a tax would increase government revenue, discourage short-term speculative trading, and hence reduce price volatility. Opponents of an STT argue that it would reduce market liquidity (i.e., decrease trading volume and increase bid-ask spreads), increase the cost of capital and the cost of hedging (but not necessarily reduce price volatility), and weaken the international competitiveness of US equity and futures exchanges. My review of the empirical evidence of the impacts of an STT on market quality in different countries confirms that the costs of an STT seem to outweigh the benefits.

The potential tax revenue of an STT is often substantially overestimated by its proponents because they use either a pre-tax trading volume or an unrealistically low elasticity of trading volume with respect to trading costs. Furthermore, some futures and stocks with high elasticity are likely to be shifted to untaxed foreign markets should an STT be imposed. Previous studies also indicate that a sizable STT on futures and stock markets would not likely raise substantial revenue for the US government, but it might hurt the international competitiveness of the US equity and futures markets.

37. An elasticity of -0.87 means that, given a 10 percent increase in trading costs, the trading volume of 30-year T-bond futures would decline by 8.7 percent.

38. Bjursell and his colleagues estimate the total fixed transaction cost for one S&P 500 index futures contract to be \$14.80 and the transaction tax of 0.02 percent of the notional value of one S&P 500 index futures contract (based on the 2010 average yearly price) to be \$56.79. Therefore, a transaction tax of 0.02 percent is equal to 383.76 percent of the total fixed transaction cost of \$14.80. Bjursell, Wang, and Yau, "Transaction Tax and Market Quality of U.S. Futures Exchanges."