



# FINANCIAL TRANSACTION TAXES: BENEFITS AND COSTS<sup>\*</sup>

by

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## EXECUTIVE SUMMARY

In recent months, various public policy groups, economists, and politicians have advocated the imposition of a tax on financial transactions. Proponents claim that financial transaction taxes (“FTTs”) will advance the goals of raising revenue and discouraging “destabilizing speculation.”

At the same time, opponents of FTTs claim that transaction taxes are unlikely to achieve their stated goals, and claim instead that FTTs harm the performance of financial markets by reducing market depth and liquidity, increasing market volatility, putting downward pressure on asset prices, increasing the costs of raising capital, and diminishing the international competitiveness of the U.S. financial services industry.

Various FTTs have been imposed throughout the world in recent decades and have been the subject of considerable economic research. That literature provides a valuable lens through which the claims made by both FTT proponents and skeptics can be viewed. This paper evaluates the likely economic consequences of the establishment of FTTs in the United States using this economic literature as a guidepost and concludes that FTTs are unlikely to generate significant revenue and are very likely to interfere significantly with the performance of the U.S. financial markets.

The economic literature evaluates the impact of transactions taxes from both theoretical and empirical perspectives. The empirical analyses typically evaluate “natural experiments” resulting from the imposition, modification, and abolition of FTTs in a variety of countries. Examples include the following:

- Japan introduced a FTT on stock sales in 1953 that was subject to periodic rate changes, including a series of rate reductions beginning in 1989 which resulted in the elimination of the FTT in 1999.<sup>a</sup>
- Sweden imposed a FTT on equity transactions in 1984. Rates were subsequently increased, as was the range of financial instruments covered by the tax. The scope of the tax was subsequently narrowed in 1990, and the tax was eliminated in 1991.<sup>b</sup>
- The United Kingdom introduced a “stamp duty reserve tax” in 1986 on the transfer of legal ownership of U.K. shares.<sup>c</sup>
- China introduced a stamp tax in 1990. Rates have occasionally been increased and decreased several times since.

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<sup>a</sup> S. Liu, “Securities Transaction Tax and Market Efficiency: Evidence from the Japanese Experience,” *Journal of Financial Services Research* Vol. 32, No. 3 (2007).

<sup>b</sup> J. Campbell and K. Froot, “International Experiences with Securities Transaction Taxes,” *NBER Working Paper No. 4587* (December 1993).

<sup>c</sup> *Id.*

- Greece introduced a FTT on stock transactions in 1998 and subsequently both raised and lowered the rates.
- India introduced a FTT on stock transactions in 2004.

None of these events present a precise analog for evaluating the current FTT proposals in the United States. When considered together with the economic literature that evaluates FTTs from a theoretical perspective, however, these natural experiments provide valuable insights into the likely economic impact of current proposals.

### **Summary of Conclusions**

***A review of the theoretical and empirical economic literature on FTTs indicates that many of the claims made by proponents of FTTs are not supported by available economic theory and evidence. Per contra, the economic literature indicates that imposition of FTTs is unlikely to generate significant revenue and is likely to interfere (perhaps significantly) with the performance of U.S. financial markets.***

The major conclusions of this review are as follows:

***(1) The dual goals of FTTs to deter speculation and raise revenue are irreconcilably at odds with one another.***

The two claimed benefits of FTTs – raising revenues and deterring speculation – are inherently at odds with one another. In order for a FTT to reduce speculation, the FTT must reduce the volume of short-term transactions. Any such reductions in trading volume induced by the FTT, however, also reduce the potential for the FTT to generate revenue. The tax rate must be high enough to have a material impact on trading behavior in order to achieve the claimed goals of reducing speculation and market volatility. Yet, sizeable reductions in trading volumes limit the revenue that the tax can be expected to generate.

Empirical evidence supports the conclusion that an FTT will reduce trading volume and thus will not generate the tax revenue claimed by supporters. The limited revenue-generating potential of a “successful” FTT is not merely hypothetical, and is reflected in the history of Sweden’s imposition of FTTs. Bond trading volume plummeted by about 85% within one week of the imposition of that tax, and trading in interest rate futures also plunged by around 98%. At the same time, the Swedish fixed-income tax raised only about three percent of the initial projected revenue estimates.

***(2) FTTs raise the cost of financial transactions often by significant amounts.***

FTTs raise the costs of financial transactions by design. As a result, FTTs affect both fee-based trading costs as well as bid/ask spreads, which are the principal mechanism by which market makers are compensated for providing liquidity to a financial market. The impact of a FTT on trading volume depends largely on the size of the tax relative to other costs of trading. Although FTTs that have been proposed in Congress appear to be small, the proposed taxes

would result in very large increases in transactions costs. For example, the proposed 0.02% FTT on derivatives transactions would increase the cost of trading a single CME Eurodollar futures contract (with a notional value of \$1 million) from less than under \$13 to more than \$400.

***(3) FTTs likely will have adverse impacts on asset prices and will engender commensurate increases in the cost of capital for many corporations.***

Some contend that a FTT will increase average asset prices by reducing the “excess volatility” that some believe increase the risk premium investors demand to hold securities. Most theoretical evaluations of FTTs, however, contend that FTTs would drive average securities prices down – viz., the higher costs of financial transactions would drive up required rates of return and in turn drive asset prices down.

The empirical economic literature indicates that even a modest FTT could result in substantial declines in asset values, which in turn would increase the cost of raising capital for corporate security issuers. Studies of the impact of FTTs in Japan, the United Kingdom, Sweden, and a variety of other countries indicate that imposition of FTTs (and/or increases of FTT rates) were associated with declines in asset prices.

***(4) FTTs likely will divert trading to untaxed jurisdictions and financial markets.***

The success of FTTs in raising revenues depends critically on whether the overall volume of trading falls or whether it simply shifts to venues and products not subject to taxation. If a FTT merely forces market participants to transact in untaxed markets and products, then the FTT will fail to achieve either of its goals – it will neither reduce speculation, nor will it succeed in generating significant revenue.

Most financial transactions today can be executed in a variety of trading venues worldwide. A FTT imposed in the United States that is not simultaneously imposed (in substantively the same form) in other major financial centers thus will give rise to significant tax arbitrage opportunities. The likely impact of a U.S. FTT on the diversion of financial transactions to other jurisdictions has been widely noted. In fact, a number of European countries have approved FTTs but have conditioned their implementation of those taxes on adoption by all countries in the European Union of a similar tax.

Empirical evidence from China, Finland, Japan, Sweden, Taiwan, and other countries generally supports the notion that non-global FTTs cause trading to migrate to lower-tax jurisdictions and/or lead to sizeable reductions in trading volume. Empirical evidence also indicates that reductions in FTTs tend to lead to an increase in trading volume. In the United Kingdom, the stamp tax on transfers of ownership of securities has led to the development of active markets in off-exchange derivatives contracts that replicate the cash flows of underlying securities without transferring ownership (and hence without triggering the tax). As market commentators have noted, a significant migration of U.S. equities volume either to less-transparent over-the-counter venues or non-U.S. markets would not be a welcome result from a regulatory perspective.

Existing studies imply that the revenue potential of FTTs depends strongly on how FTTs impact trading volume. As such, estimates of revenue generated by a FTT that fail to properly account for its impact on trading volume can be highly inaccurate. For example, Sweden's FTT on fixed-income instruments generated roughly only three percent of its expected revenue.

Proponents of current Congressional proposals claim that FTTs could raise \$150 billion annually, but the basis of this estimate has not to my knowledge been disclosed. Estimates of revenue generated by FTTs should be closely scrutinized to ensure they accurately account for the impact of FTTs on trading volume.

***(5) FTTs would not necessarily reduce price volatility and, in some instances, can increase price volatility as a result of reduced liquidity.***

FTT proponents claim that a major goal of the tax is the reduction in the volatility of asset prices. They claim that FTTs reduce price volatility which, they contend, would improve the "informational efficiency" of financial markets.

Price volatility is a concept that can take on a variety of meanings. To academics, volatility typically means the variability of asset prices or returns; to others, volatility often refers instead to the speed with which financial markets respond to new information; and to yet others, volatility reflects prices that "overshoot" price levels based on economic fundamentals. Each of these concepts of volatility is addressed in the economic literature. Regardless of the meaning of "price volatility," however, the empirical evidence does not generally support the view that FTTs reduce price volatility.

Some theoretical models predict that FTTs can reduce any of these measures of price volatility by reducing speculative trading, while other theoretical models predict that FTTs can increase price volatility by reducing market depth and liquidity. This question thus cannot be resolved based on theory alone. Available empirical evidence, however, does not support the assertion that FTTs will improve the informational efficiency of financial markets.

Most empirical studies find that FTTs either have no effect on price variability or find that increases (decreases) in FTT tax rates have been followed by increases (decreases) in price variability. These results (based on studies of changes in FTT rates in China, Finland, Greece, Sweden, Taiwan, the United Kingdom, and elsewhere) are generally consistent with the view that the decrease in market depth and liquidity resulting from higher FTT rates are more significant than the factors that might tend to depress volatility. Studies of the impact of other changes in transaction costs based on financial markets in countries like France, India, and the United States also indicate that increased transactions costs (generally) also tend to result in greater price variability.

As already mentioned, the term "price volatility" often refers to the speed at which trading and price changes occur. FTTs are viewed by some as valuable because they reduce the speed of price changes. A variety of economic studies indicate, however, that FTTs may slow the speed with which prices adjust to new information. Ironically, reductions in the speed with which markets respond to prices may *benefit* certain speculators by increasing opportunities to trade at less-informative prices. For example, firms that engage in algorithmic trading have

contributed to the large growth in trading volume in recent years and react very quickly to new market information. The large increase in trading costs resulting from a FTT would likely have a significant impact on total trading volume as well as the financial health of organized exchanges.

Yet another meaning of “price volatility” is the supposed overshooting of market prices relative to levels dictated by economic fundamentals. The question of whether speculators are disrupting commodity markets and are responsible for the large price swings that many commodities have experienced in recent years, for example, has been the subject of considerable dispute. Although there is no consensus about the role of speculation on changes in commodity prices, numerous recent economic studies have concluded that speculative trading is *not* responsible for these swings. For example, a variety of studies stress that many non-exchange traded commodities that are unaffected by speculation have experienced price swings as large as those observed for exchange-traded commodities in which speculators play a significant role.

***(6) FTTs are not expected to affect managerial decision making.***

Advocates of FTTs emphasize that transactions taxes will decrease trading with very short time horizons. Such proponents of FTTs thus claim that FTTs will help enable managers to focus more on long-term decision making instead of short-term issues affecting stock prices.

In order for these concerns to be valid, however, one must embrace the notion that managers of corporations sacrifice longer-term investment opportunities in order to manage shorter-term earnings and stock price changes. There is little support in the economic literature for the view that managers systematically overlook longer-term investment opportunities. Indeed, even some supporters of FTTs have been highly skeptical of this argument.

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## I. INTRODUCTION

In recent months, various public policy groups, economists, and politicians have advocated the imposition of a tax on financial transactions. In the wake of the credit crisis, the ostensible appeal of financial transaction taxes (“FTTs”) – viz., raising revenues while discouraging what some perceive as “destabilizing speculation” – resonates with many in the public. Indeed, one FTT proposal currently before the U.S. House of Representatives is entitled the “Let Wall Street Pay for the Restoration of Main Street Act of 2009.” A similar proposal has been introduced in the U.S. Senate.

At the same time, opponents of FTTs claim that FTTs are unlikely to achieve proponents’ goals of raising revenue or reducing so-called “socially wasteful trading” or “excessive market volatility.” Opponents instead claim that FTTs introduce new imperfections into financial markets that could reduce market depth and liquidity, impose costs on market participants other than the ones the tax is primarily intended to impact, increase market volatility, put downward pressure on stock prices, and diminish the international competitiveness of the U.S. financial services industry.

FTTs are, of course, nothing new, and have been the subject of considerable economic research over the years. That literature provides a valuable lens through which the claims made by both FTT proponents and skeptics can be viewed. This paper evaluates the likely economic consequences of FTTs using this economic literature as a guidepost. Given the variety of proposals currently being made, I do not attempt to evaluate any specific proposal, but rather address this issue from a more general perspective (based on the economic literature) that evaluates the impact of FTTs.

***This review indicates that many of the claims made by proponents of FTTs are not supported by available economic theory and evidence. On the contrary, the imposition of FTTs is unlikely to generate significant revenue, and is likely to interfere with the performance of financial markets.***

More specifically, the economic literature indicates that: (i) FTTs designed to discourage certain types of financial transactions are likely to interfere with the ability of financial markets to allocate resources to their most highly valued uses; and (ii) the revenue-raising potential of FTTs depends strongly on how the tax affects transaction volume, and past FTTs have often resulted in the diversion of transactions to non-taxed products and jurisdictions.

## II. FTT PROPOSALS

Current proponents of FTTs have argued that FTTs will have two primary benefits: (i) raising needed tax revenues; and (ii) discouraging excess speculation and excessive volatility. Certain proponents also claim that FTTs are borne by “Wall Street” and that retail investors and “Main Street” would not be adversely affected.

More specifically, FTTs proponents claim that:

- A FTT could be “designed to discourage excessive share trading and encourage longer-term ownership.”<sup>1</sup>
- A FTT “would make speculation less profitable, keeping some of the speculators’ greed in check” and “would encourage Wall Street to invest more of their resources in the productive economy to the benefit of all Americans, instead of just a wealthy few.”<sup>2</sup>
- A FTT “disincentivizes excessive speculation because much of the excessive risk on Wall Street is high-volume speculative trading” and “[I]egitimate hedges, like airlines, benefit from stable prices no longer manipulated by speculative trading.”<sup>3</sup>
- A FTT “raises money in a way that comes primarily at the expense of speculation” (“For the typical person holding stock, who is planning to hold it for a long time, paying the quarter of one percent of a trade is just not that big a deal”), is “a very progressive tax”, and “discourages nonproductive activity.”<sup>4</sup>
- A FTT is “the most painless way” to “raise revenues, pay the bills and create jobs in America” and “Wall Street can easily bear this tax.”<sup>5</sup>
- A FTT “would be a trivial expense for long-term investors, but it would deter much of the churning that now takes place in our hyperactive financial markets” and “could generate substantial revenue, helping alleviate fears about government deficits.”<sup>6</sup>

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<sup>1</sup> Aspen Institute, *Overcoming Short-termism: A Call for a More Responsible Approach to Investment and Business Management* (September 9, 2009), p. 4.

<sup>2</sup> Senator Bernard Sanders (I-VT) quoted by A. Sorkin, “Transaction Tax Is Floated on Capitol Hill” (October 16, 2009) (<http://dealbook.blogs.nytimes.com/2009/10/16/transaction-tax-is-floated-on-capitol-hill>).

<sup>3</sup> Press Release, “Let Wall Street Pay for the Restoration of Main Street Act of 2009 – DeFazio/Perlmutter/Arcuri/Braley/Sutton” ([www.defazio.house.gov/images/zoom/MZCTYM/wall%20street%20-%20main%20street%20summary.doc](http://www.defazio.house.gov/images/zoom/MZCTYM/wall%20street%20-%20main%20street%20summary.doc))

<sup>4</sup> D. Baker quoted in B. Herbert, “Where the Money Is,” *New York Times* (January 13, 2009).

<sup>5</sup> Senator Tom Harkin (D-IA) quoted in Press Release, “DeFazio Introduces Legislation Invoking Wall Street ‘Transaction Tax’,” *News from U.S. Representative Peter DeFazio* (December 3, 2009).

<sup>6</sup> P. Krugman, “Taxing the Speculators,” *New York Times* (November 27, 2009).

- A FTT would “provide the revenues we need to support federal spending and for offsetting the costs of a current jobs package.”<sup>7</sup>

#### A. Historical Context

Financial transaction taxes are nothing new as a proposed device for raising public financing and tamping down financial activities that are viewed by some as socially harmful. In 1936, Lord Keynes, for example, advocated a transaction tax on U.S. stock transactions to match the one assessed on English stockbrokers at the time:

In one of the greatest investment markets in the world, namely, New York, the influence of speculation ... is enormous.... It is usually agreed that casinos should, in the public interest, be inaccessible and expensive. And perhaps the same is true of Stock Exchanges. That the sins of the London Stock Exchange are less than those of Wall Street may be due, not so much to differences in national character, as to the fact that to the average Englishman, Throgmorton Street is, compared with Wall Street to the average American, inaccessible and very expensive. The jobber’s “turn,” the high brokerage charges and the heavy transfer tax payable to the Exchequer, which attend dealings on the London Stock Exchange, sufficiently diminish the liquidity of the market...to rule out a large proportion of the transactions characteristic of Wall Street. The introduction of a substantial Government transfer tax on all transactions might prove the most serviceable reform available, with a view to mitigating the predominance of speculation over enterprise in the United States.<sup>8</sup>

In the years since, taxes on financial transactions have routinely reappeared as proposed mechanisms for improving the performance of financial markets. Notably, in 1978 James Tobin (a Yale University economist and the winner of the 1981 Nobel Memorial Prize in Economic Sciences) proposed a tax on foreign exchange transactions for reasons similar to those articulated by Keynes – viz., to “throw some sand in the well-greased wheels”<sup>9</sup> of international currency markets in order to “moderate swings in international exchange rates”<sup>10</sup> caused by excessive speculation. Tobin stated:

What we have is an incredibly efficient set of financial markets in which various obligations, mostly short-term, expressed in various currencies are traded. I use

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<sup>7</sup> L. Mishel, *Testimony before the Subcommittee on Income Security and Family Support, Committee on Ways and Means, U.S. House of Representatives* (October 8, 2009).

<sup>8</sup> J. M. Keynes, *The General Theory of Employment, Interest, and Money* (New York: Harcourt Brace and Co., 1936), pp. 159-160.

<sup>9</sup> J. Tobin, “A Proposal for International Monetary Reform,” *Eastern Economic Journal* Vol. 4, Nos. 3-4 (1978), p. 158.

<sup>10</sup> Tobin, *op. cit.*, p. 159.

mean the word “efficient” only in the mechanical sense: transaction costs are low, communications are speedy, prices are instantaneously kept in line all over the world, credit enables participants to take large long or short positions at will or whim. Whether the market is “efficient” in the deeper economic-informational sense is very dubious. In these markets, as in other markets for financial instruments, speculation on future prices is the dominating preoccupation of the participants.<sup>11</sup>

As this passage suggests, Prof. Tobin’s policy goal was to reduce excessive speculation, not to raise revenue.

Prof. Tobin’s 1978 proposal was not implemented. Various Tobin-like taxes, however, have been proposed in the United States over the ensuing years. For example:<sup>12</sup>

- In 1982, Congress considered a surcharge on futures contracts of \$0.06 per purchase or sale.
- In 1987, a stock transaction tax was proposed by then Speaker of the House Jim Wright.
- In 1990, the Omnibus Budget Reconciliation Act included a proposed FTT of 0.5% on all securities, futures, and options transactions. The tax was dropped from the final approved budget.
- In 1991, 1992, and 1993, the Bush Administration proposed per-contract taxes on futures transactions of 11, 13, and 15 cents, respectively. None of these proposals were included in the congressionally approved budgets.

None of these proposals were adopted into law.

Various other Tobin Tax proposals have been considered and, in some instances, implemented in jurisdictions outside the United States.<sup>13</sup> Some examples include:

- Japan imposed a FTT of 0.15% on sellers of stock in 1953. The rate was periodically raised, reaching 0.55% in 1981. A series of rate reductions began in 1989, and the FTT was finally eliminated altogether in 1999.<sup>14</sup>

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<sup>11</sup> Tobin, *op. cit.*, p. 157.

<sup>12</sup> R. G. Hubbard, “Securities Transactions Taxes: Tax Design, Revenue, and Policy Considerations,” *Tax Notes* (November 22, 1993), and G. W. Schwert and P. J. Seguin, “Securities Transaction Taxes: An Overview of Costs, Benefits and Unresolved Questions,” *Financial Analysts Journal* Vol. 49, No. 5 (1993).

<sup>13</sup> Prof. Tobin has reportedly distanced himself from Tobin tax advocates. See, for example, C. Fleming, “France Institutes Controversial Tax on Currency Deals – Conditional Language Makes Levy Unworkable, Critics Say,” *Wall Street Journal Europe* (November 21, 2001).

<sup>14</sup> S. Liu, “Securities Transaction Tax and Market Efficiency: Evidence from the Japanese Experience,” *Journal of Financial Services Research* Vol. 32, No. 3 (2007).

- Sweden implemented a FTT of 0.50% on equity transactions in 1984 and doubled the tax rate in 1986. In 1989, the FTT was broadened to include fixed-income securities and their derivatives. The tax rates on the fixed-income instruments varied, but were much lower than the FTT on equities, with a maximum rate of 0.15% of the underlying notional or cash amount. The FTT on fixed-income instruments was abolished in 1990 and the FTT on equity transactions was abolished in 1991.<sup>15</sup>
- In 1986, the United Kingdom introduced a “stamp duty reserve tax” of 0.5% that applied (and continues to apply today) to “ordinary shares” (*i.e.*, common stock) and assets convertible into shares (*e.g.*, convertible bonds). Stamp duty is a tax on registration (*i.e.*, the transfer of legal ownership of U.K. shares), not a tax on the securities transaction itself.<sup>16</sup>
- China introduced in 1990 a stamp tax of 0.3% prior to the formal establishment of the Shanghai Stock Exchange and Shenzhen Stock Exchange on December 1, 1990. The FTT was paid by both buyers and sellers. A few months later, the tax rate was doubled on a trial basis, but was restored to the original rate after a large fall in the stock market in October 1991. The tax rate was raised to 0.5% in 1997.<sup>17</sup>
- Greece introduced a FTT of 0.3% on the selling of shares transacted on the stock exchange in 1998, doubled the tax rate the following year, and reduced it back to its original rate effective in 2001. In January 2005, the tax rate was reduced from 0.3% to 0.15%.<sup>18</sup>
- Canada passed a resolution in 1999 in which the introduction of a FTT on foreign exchange transactions was conditional on widespread adoption of a similar tax by other countries.<sup>19</sup>
- The French Parliament voted in 2001 to institute a FTT on foreign exchange transactions conditional on other European Union member countries adopting a similar tax.<sup>20</sup>

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<sup>15</sup> J. Campbell and K. Froot, “International Experiences with Securities Transaction Taxes,” *NBER Working Paper No. 4587* (December 1993).

<sup>16</sup> *Id.*

<sup>17</sup> B. Baltagi, D. Li, and Q. Li, “Transaction Tax and Stock Market Behavior: Evidence from an Emerging Market,” *Empirical Economics* Vol. 31, No. 2 (2006).

<sup>18</sup> K. Phylaktis and A. Aristidou, “Security Transaction Taxes and Financial Volatility: Athens Stock Exchange,” *Applied Financial Economics* Vol. 17, No. 18 (2007).

<sup>19</sup> Fleming, *op. cit.*

<sup>20</sup> *Id.* The French Senate overturned the parliament vote to adopt the conditional FTT on foreign currency transactions in December 2001. “French Senate Quashes Bid to Adopt Tobin Tax,” *Agence France-Presse* (December 11, 2001).

- The Belgian Parliament passed a law in 2004 introducing a FTT on foreign exchange transactions that would come into effect only with a special European directive or if all members of the European Union passed similar laws.<sup>21</sup> The FTT would tax foreign currency transactions conducted outside of an established trading band at a much higher rate than transactions conducted within the band.<sup>22</sup>
- India introduced a FTT in 2004 on stock transactions. In its 2008-09 budget, the Indian government proposed a FTT of 0.017% on futures trading. Today, buyers and sellers of equity shares on a stock exchange pay a tax rate of 0.075%, sellers of mutual fund shares pay a rate of 0.15%, and sellers of derivatives contracts (both futures and options) pay 0.01%.<sup>23</sup>

The impact of these taxes has been the focus of a variety of economic studies, which are reviewed and summarized in later sections of this paper.

## B. Recent FTT Proposals

In the wake of the global credit crisis, various forms of FTTs have been proposed by the Aspen Institute<sup>24</sup> and a variety of other public policy or labor organizations including the Economic Policy Institute,<sup>25</sup> Center for Economic Policy Research,<sup>26</sup> and the AFL-CIO.<sup>27</sup>

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<sup>21</sup> M. Quaghebeur, "Belgium Supports Tobin Tax," *Tax Notes International* (November 29, 2004).

<sup>22</sup> In 1995, Paul Bernd Spahn opposed the *original* form of a Tobin Tax, concluding "the original Tobin tax is not viable" in part because "it is virtually impossible to distinguish between normal liquidity trading and speculative 'noise' trading. If the tax is generally applied at high rates, it will severely impair financial operations and create international liquidity problems, especially if derivatives are taxed as well." (p. iv) Spahn also argued: "Most of the difficulties of the Tobin tax could be resolved, possibly with a two-tier rate structure consisting of a low-rate financial transactions tax and an exchange surcharge at prohibitive rates." (p. iv.) This new form of tax – the "Spahn tax" – was later approved by the Belgian Federal Parliament in 2004. See, P. Spahn, "International Financial Flows and Transactions Taxes: Survey and Options," *International Monetary Fund Working Paper WP/95/60* (June 1995).

<sup>23</sup> See, D. Sahu, "Does Securities Transaction Tax Distort Market Microstructure? Evidence from Indian Stock Market," *Indian Journal of Commerce* Vol. 61, No. 1 (2008); and P. Sahoo and R. Kumar, "Impact of Proposed Commodity Transaction Tax on Futures Trading in India," *Indian Council for Research on International Economic Relations Working Paper No. 216* (July 2008). Current Indian FTT rates are from the Embassy of India website: [www.indianembassy.org/newsite//Doing\\_business\\_In\\_India/Fiscal\\_Taxation\\_system\\_in\\_India.asp#3d](http://www.indianembassy.org/newsite//Doing_business_In_India/Fiscal_Taxation_system_in_India.asp#3d).

<sup>24</sup> Aspen Institute, *op. cit.* The statement released by the Aspen Institute actually called for adjustments in capital gains taxes and did not specifically call for the introduction of a transaction tax. Signatories to the Aspen Institute report, as listed on page 7 of the report, include Warren Buffet (Berkshire Hathaway), John Bogle (Vanguard), Martin Lipton (Wachtell, Lipton, Rosen and Katz), Ira Millstein (Yale University), James Rogers (Duke Energy), Lynn Stout (UCLA), and Richard Trumka (AFL-CIO). Signatories signed as concerned individuals and not on behalf of any organization.

<sup>25</sup> L. Mishel, *Testimony before the Subcommittee on Income Security and Family Support, Committee on Ways and Means, U.S. House of Representatives* (October 8, 2009).

<sup>26</sup> D. Baker, *The Benefits of a Financial Transactions Tax* (Center for Economic Policy Research, December 2008).

In addition, the U.S. Congress is currently considering FTT proposals. The most prominent current Congressional proposals for imposition of a FTT are the “Let Wall Street Pay for the Restoration of Main Street Act of 2009” introduced by Rep. Peter DeFazio (D-OR) and 20 cosponsors on December 3, 2009, and the “Wall Street Fair Share Act” introduced by Sen. Tom Harkin (D-IA) and three cosponsors on December 23, 2009.

When Rep. DeFazio introduced his legislation, he stated that “[t]he American taxpayers bailed out Wall Street during a crisis brought on by reckless speculation in the financial markets. This legislation will force Wall Street to do their part and put people displaced by that crisis back to work.”<sup>28</sup> Rep. DeFazio claims that “[m]uch of the excessive risk on Wall Street is in the form of high-volume short-term speculative trading” and that the legislation “will provide a disincentive for excessive speculation.”<sup>29</sup>

In its current form, the DeFazio plan would impose a FTT of 0.25% on stock and equity option transactions and 0.02% on derivatives transactions (including futures, futures options, swaps, options on swaps, credit default swaps, and options on credit default swaps). The bill’s sponsors estimate (without providing any support) that the proposal will annually generate about \$150 billion in revenue, half of which would go toward deficit reduction and the other half will be deposited in a Job Creation Reserve “to fund the creation of good paying jobs and put Americans back to work rebuilding our nation’s infrastructure.”<sup>30</sup>

The specifics of the Harkin plan differ somewhat from the DeFazio proposal. Under the Harkin proposal, derivatives transactions would be taxed at 0.25% (compared to the DeFazio FTT of 0.02%), and short-term debt instrument transactions (*i.e.*, debt with a stated original tenor of one year or less) would be taxed at 0.02% (but would not be taxed under the DeFazio plan). The Harkin plan would tax equity transactions at 0.25% and “hedging transactions” at 0.02%. Unlike the DeFazio plan, the Harkin plan also contains an exception for the initial issuance of a security.

Rep. DeFazio claims that his proposal is targeted at speculators and “has no impact on the average investor and pension plans.”<sup>31</sup> Ostensibly to help achieve that objective, the DeFazio FTT (as well as the Harkin FTT) would be refunded for transactions in tax-favored retirement accounts, education savings accounts, health savings accounts, and transactions involving the purchase or sale of mutual funds shares. In addition, tax on the first \$100,000 of stock transactions annually that are not already exempt (*i.e.*, \$250 per person) would also be refunded.

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<sup>27</sup> D. Silvers, *Testimony before the Committee on Homeland Security and Governmental Affairs, U.S. Senate* (March 4, 2009).

<sup>28</sup> Press Release, “DeFazio Introduces Legislation Invoking Wall Street ‘Transaction Tax’,” *News from U.S. Representative Peter DeFazio* (December 3, 2009).

<sup>29</sup> *Id.*

<sup>30</sup> *Id.*

<sup>31</sup> *Id.*

### C. Irreconcilable Differences in the Goals of FTTs?

The two claimed benefits of FTTs – raising revenues and deterring speculation – are inherently at odds with one another. In order for a FTT to reduce speculation, the FTT must reduce the volume of short-term transactions. Any such reductions in trading volume induced by the FTT, however, also reduce the potential for the FTT to generate revenue. In other words, the tax rate must be high enough to have a material impact on trading behavior in order to achieve the claimed goals of reducing speculation and market volatility.

Yet, sizeable reductions in trading will limit the revenue-generating potential of the tax. The limited revenue-generating potential of a “successful” FTT is not a mere hypothetical possibility. As discussed in more detail below, Sweden’s attempt to tax fixed-income securities and related derivatives (*e.g.*, interest rate futures and options) resulted in an 85% reduction in bond trading volume within one week and a decline in interest-rate futures trading of 98%. In the words of two economists who studied the Swedish FTT, “the turnover tax raised little revenue, and a good deal less than the authorities expected.”<sup>32</sup> Sweden’s Finance Ministry had initially estimated that tax revenues from fixed-income transactions would be SEK 1500 million annually. Realized annual revenues averaged only SEK 50 million – *i.e.*, about 3.3% of the initial estimate.<sup>33</sup> As noted above, Professor Tobin himself had conditioned his support of an FTT on its potential for reducing speculation, not as an effective means to raise revenue.

Especially in light of the inherent tensions between the primary objectives of FTTs, further examination of the available economic evidence regarding assertions made by FTT proponents is merited.

## III. THE COST OF TRANSACTING

By design, FTTs raise the cost of trading and reduce transaction volume. FTT proponents claim that this benefits society, whereas opponents claim that FTTs interfere with the function played by markets in allocating resources to their most highly valued uses. Before addressing what the economic literature has to say about these claims, this section reviews the various transactions costs faced by participants in financial transactions even without a FTT and broadly explains how the proposed FTT will change those costs.

### A. Sources of Financial Transaction Costs

The nature and size of transaction costs that market participants may incur depend on the type of financial asset, the market in which it is traded, and the types of trading counterparties:

- *Financial Assets:* Very broadly, financial assets can include securities (*e.g.*, stocks and bonds), negotiable banking and depository instruments (*e.g.*, institutional loans and

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<sup>32</sup> Campbell and Froot, *op. cit.*, pp. 9-10.

<sup>33</sup> *Id.*, p. 10.

brokered deposits), derivatives (*e.g.*, futures, forwards, options, and swaps), and foreign currencies.

- *Markets:* Financial assets are generally either traded on an organized exchange (*e.g.*, the New York Stock Exchange or CME Group) or are privately negotiated off-exchange in decentralized dealer markets such as the foreign exchange market and markets for over-the-counter (“OTC”) derivatives (*e.g.*, interest rate swaps, credit default swaps, commodity forwards and swaps, and OTC equity derivatives).
- *Participants:* Types of market participants depend on whether the financial asset is being traded on an organized exchange or OTC. In exchange markets, participants (apart from exchanges and clearinghouses) may include broker/dealers and futures commission merchants, proprietary traders, market makers, and end customers (*e.g.*, individuals, pension and mutual funds, other institutional investors and asset managers, and more). OTC transactions are usually conducted between two dealers or between a dealer and an end user (*i.e.*, individual customer, institutional investor, corporation, etc.).

Although the exact type and magnitude of transaction costs can differ across the above dimensions, most transactions require market participants to pay at least some explicit fees. Transaction costs currently include fees paid to brokers (*i.e.*, commissions), fees paid to counterparties, exchange fees, and clearinghouse fees. A FTT would increase those costs either through the direct assessment of the tax or through increased fees charged by financial intermediaries to their customers for the higher tax they must pay on their customers’ behalf. Transaction taxes thus will either be explicit or will implicitly result in an increase in the transaction costs faced by market participants.

In addition to increasing the direct fee-based costs of engaging in a financial transaction, FTTs will also increase the cost of liquidity provision by market makers and other suppliers of liquidity in a marketplace.<sup>34</sup> That cost will be passed on to customers in part (or in whole) through increased bid-ask spreads.<sup>35</sup> The bid-ask spread is the difference between the price at which a market maker offers to sell an asset and the price at which the intermediary is willing to buy the same asset at the same time. The bid-ask spread is the principal means by which market makers are compensated for providing liquidity.

## B. Size Matters

The impact of a FTT on trading volume depends largely on the size of the tax relative to other costs of trading. Although the magnitudes of the tax rates for the proposed FTTs may sound small, they are actually many times the size of the average bid-ask spreads, which means that the cost paid by investors (including smaller investors that would otherwise be exempt under the DeFazio bill) will increase dramatically.

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<sup>34</sup> See, *e.g.*, S. Grossman and M. Miller, “Liquidity and Market Structure,” *Journal of Finance* Vol. 43, No. 3 (1988).

<sup>35</sup> H. Demsetz, “The Cost of Transacting,” *Quarterly Journal of Economics* Vol. 82, No. 1 (1968).

To illustrate the substantial increase in transactions costs from the proposed FTTs, consider an investor that wishes to purchase the Vanguard Total Stock Market Exchange-Traded Fund (“ETF”). The FTT of 0.25% would be more than six times the bid-ask spread of 0.04% (\$0.02).<sup>36</sup> The per-share cost of transacting would increase from 0.04% of market value to 0.29%, or from \$0.02 to \$0.145. On a 100-share transaction, the transaction cost faced by an investor would increase from \$2 to \$14.50.

Similarly, although a proposed tax of .02% (*i.e.*, 2 basis points) on derivatives transactions sounds very small, the tax will actually be quite large *vis-à-vis* other trading costs. A recent circular from CME Group, for example, compared the size of the FTT proposed by Rep. DeFazio to other costs of trading CME’s Eurodollar futures contract, which is the most widely traded futures contract in the United States.<sup>37</sup>

The 2 basis point tax in the DeFazio proposal would result in a tax bill of \$400 on a “round trip” transaction for a single Eurodollar futures contract (which has a notional value of \$1 million). For comparison purposes, a market maker trading Eurodollars pays the exchange roughly \$0.11 per contract (\$0.22 on a round trip transaction) and would face costs of roughly \$12.50 to cover the typical bid-ask spread.

The enormous increase in trading costs resulting from the proposed FTT would provide a strong incentive for market participants to find other venues for trading Eurodollars or to cease trading them altogether. Eurodollars are not listed exclusively on the CME – they are also currently listed at Euronext.LIFFE in Europe. Although Euronext.LIFFE generates very little volume in comparison with the CME, the imposition of a FTT could rapidly change that competitive calculus.

#### **IV. REVENUE-GENERATING POTENTIAL AND VOLUME EFFECTS OF FTTs**

Microeconomic theory informs us that the revenue-generating potential of any tax depends critically on how the demand and/or supply of the taxed activity respond to the tax. Activities that are highly sensitive to a small change in costs are described by economists as being “price-elastic,” and the public financing raised by taxing such activities depends critically on the extent to which the quantity of activity falls in response to imposition of the tax. The revenue potential from taxing a price-elastic activity is generally much more difficult to estimate than for a “price-inelastic” activity in which quantity demanded and/or supplied is less sensitive to the imposition of the tax.

Schwert and Seguin use a simple but effective model to demonstrate the potential impacts of FTTs on tax revenues.<sup>38</sup> Specifically, the revenue generated by a tax depends on its impact on

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<sup>36</sup> Bid-ask data are from <https://institutional.vanguard.com/VGApp/iip/site/institutional/investments/bidaskspread> (accessed January 31, 2010). The bid-ask spread is the 30-day average as of January 29, 2010.

<sup>37</sup> CME Group, “A Tax on Futures Transactions Will Lose More Tax Revenue Than It Will Raise,” *Press Release* (December 2, 2009).

<sup>38</sup> Schwert and Seguin, *op. cit.*, p. 30.

asset prices and the volume of trading. With a constant tax rate of  $\tau$  and ignoring any exemptions, tax revenue from the FTT can be expressed as<sup>39</sup>

$$R = \tau(P + \Delta P)(Q + \Delta Q)$$

where  $R$  is revenue generated by the tax,  $P$  is the average transaction price for financial assets (volume-weighted), and  $Q$  is total quantity of taxable transactions. The symbol  $\Delta$  indicates a change resulting from the imposition of the FTT. The changes in prices and quantities that the FTT could precipitate lie at the core of any serious revenue projection. This simple framework provides the basis for analyzing the price and quantity impact of a FTT.

#### A. Price Effects

From the perspective of economic theory, the impact of a FTT on financial asset prices is ambiguous. For equity and debt securities, some argue that a tax would increase average asset prices. The theory is that the tax would discourage excessive speculation, thereby reducing the excess volatility that some contend arises from those activities. In turn, the reduction in excess volatility is presumed to reduce the risk premium that investors would require to hold securities, thereby decreasing the rate at which investors discount cash flows (the “discount rate”) and raising the level of prices.<sup>40</sup>

Most researchers contend, however, that the FTT would drive security prices down. Because the rate of return demanded by investors to hold a security is inclusive of transaction costs, the higher costs associated with a FTT would drive up required rates of return and thus drive down prices.<sup>41</sup> The downward impact of a FTT on asset prices would be more pronounced for more liquid securities because the tax would result in a relatively greater increase in transaction costs *and* because the asset volume subject to tax would be higher.<sup>42</sup>

A number of economic studies have investigated the impact of FTTs on security price levels and have concluded that imposition of even a modest FTT could result in substantial declines in asset values (and commensurate increases in costs of capital for corporate security issuers).<sup>43</sup> Consider some examples:

- Liu (2007) examined the impact of a FTT in Japan. The tax rate was raised in 1978 and 1981 and then was reduced in a series of actions from 1989 through 1999, when it was finally eliminated. Liu focused on the April 1989 reduction in the tax rate and compared the impact

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<sup>39</sup> Schwert and Seguin also consider a term reflecting changes in other tax revenues caused by the FTT, but I drop that term here for expositional simplicity.

<sup>40</sup> B. Cornell, *The Equity Risk Premium: The Long-Run Future of the Stock Market* (New York: John Wiley & Sons, 1999), p. 29.

<sup>41</sup> See, e.g., P. Kupiec, A. P. White, and G. Duffee, “A Securities Transaction Tax: Beyond the Rhetoric,” *Research in Financial Services Private and Public Policy* Vol. 5 (1993).

<sup>42</sup> Schwert and Seguin, *op. cit.*, p. 30.

<sup>43</sup> The impact of FTTs on the cost of capital is discussed further in Section VI.D.

on Japanese stock price levels and the prices of the corresponding American Depository Receipts (“ADRs”) for those same stocks listed for trading in the United States. Liu found that “the 1989 tax reform [*i.e.*, tax reduction], at the margin, had a positive impact on the prices for the underlying stocks in Japan and no impact on the prices for the control ADRs on average...”<sup>44</sup>

- Bond, Hawkins, and Klemm (2004) examined the impact of changes in the U.K.’s stamp duty and concluded that the “stamp duty clearly depresses share prices, particularly for firms with more frequently traded shares,” which “may increase the cost of capital faced by firms, which in turn could have negative repercussions on investment.”<sup>45</sup>
- Westerholm (2003) examined the partial and then complete abolition of the FTT in Sweden in 1991 and the abolition of the FTT in Finland in 1992. For Sweden, the FTT was reduced from 2% to 1% per roundtrip trade on January 1, 1991. Westerholm estimated that this change increased the share turnover rate (*i.e.*, the ratio of value of shares traded to market capitalization) in Sweden from 18% to 22% and increased stock prices by 7.5%. Westerholm further estimated that the abolition of the Swedish FTT on December 1, 1991, resulted in an increase in the share turnover ratio from 22% to 30% and increased share prices by 9.7%. For Finland, Westerholm estimated that the May 1, 1992, abolishment of the 1%-per-round-trip-transaction stamp duty on exchange-traded stocks resulted in an increase in the share turnover rate from 10% to 15% and raised stock prices by 6.6%. He estimated that the adjustment to the higher share turnover rate occurred within 14.5 months after FTT abolishment in Sweden and within 8 months for Finland.<sup>46</sup>
- Hu (1998) examined the impact of FTTs in Hong Kong, Japan, Korea, and Taiwan during the period from 1975 through 1994 and found that, on average, “an increase in [the FTT] tax rate reduces the stock price....”<sup>47</sup>
- Saporta and Kan (1997) examined the impact of the U.K. stamp duty on security prices. They found that “announcements of stamp duty increases (decreases) were followed by negative (positive) equity returns” and, comparing the prices of shares of U.K.-listed companies that are subject to stamp duty with the prices of corresponding U.S.-listed ADRs that are not subject to stamp duty, “in the absence of extensive inter-market arbitrage between the ADR

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<sup>44</sup> Liu, *op. cit.*, p. 174.

<sup>45</sup> S. Bond, M. Hawkins and A. Klemm, “Stamp Duty on Shares and Its Effect on Share Prices,” *Institute for Fiscal Studies Working Paper* (June 2004), p. 18.

<sup>46</sup> J. Westerholm, “The Impact of Transaction Costs on Turnover, Asset Prices and Volatility: The Cases of Sweden’s and Finland’s Security Transaction Tax Reductions,” *Liiketaloudellinen Aikakauskirja* Vol. 52, No. 2 (2003), p. 215.

<sup>47</sup> S. Hu, “The Effects of the Stock Transaction Tax on the Stock Market – Experiences from Asian Markets,” *Pacific-Basin Finance Journal* Vol. 6, Nos. 3-4 (1998), p. 347.

and the underlying markets, the asset which is not subject to stamp duty (the ADR) trades at a premium over the asset which is subject to stamp duty (the underlying asset).<sup>48</sup>

The price impact of a FTT on derivatives is more difficult to surmise. Derivatives like futures, forwards, and swaps are usually negotiated “at market,” which means that the transactions have a zero price at initiation – *viz.*, no initial investment expenditure is required.<sup>49</sup> As such, both longs and shorts have an expected profit of zero. And both longs and shorts thus would face a negative expected profit inclusive of the added costs arising from a FTT. As a result, the impact of FTTs on derivatives transaction prices is ambiguous.

## B. Quantity Effects

FTTs also impact the volume of trading as well as the price of traded assets. A FTT that increases the cost of trading for investors will likely reduce investor demand for trading. Similarly, a FTT that raises the cost of one type of financial transaction (say, short-term debt) relative to another (say, long-term debt) will affect the mix of assets that investors choose to hold (here, more long-term and less short-term debt). Likewise, a FTT that raises the cost of trading in *Country A* relative to *Country B* will likely precipitate a shift of trading volume away from *A* and into *B*.

So, FTTs can affect the volume of financial transactions a variety of ways. Some of these effects are discussed in the sections below.

### (1) *Direct Impact*

FTTs will raise the transaction costs of each trade and thus will reduce the volume of price-elastic trading activities like high-frequency trading and speculation. This, of course, is an affirmative objective cited by many FTT proponents. I return in Section V to the issue of whether or not FTTs are likely to be effective at controlling specific types of trading and reducing price volatility.

### (2) *Distortions of Capital Structure Decisions by Corporate Securities Issuers*

Schwert and Seguin emphasize that FTTs could distort security issuers’ capital structure decisions. To the extent that FTTs raise the post-tax expected returns required by investors to hold corporate debt and equity securities, for example, the price impact will be more pronounced for shorter-term sources of corporate financing that must be rolled over or renewed more often. As such, the higher relative cost of issuing short-term securities may induce some firms to incur greater amounts of long-term leverage in order to avoid the higher cost of capital on short-term debt that a FTT could cause.

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<sup>48</sup> V. Saporta and K. Kan, “The Effects of Stamp Duty on the Level and Volatility of UK Equity Prices,” *Bank of England Working Paper* (1997), p. 9.

<sup>49</sup> Margin, collateral, and other credit enhancements should not be mistaken for investment costs.

Zingales (2009) proposes a tax on short-term debt in lieu of a FTT precisely because of the capital structure impact it would precipitate.<sup>50</sup> Given the important role played by short-term debt in exacerbating the liquidity impact of the credit crisis,<sup>51</sup> Zingales contends that a tax on short-term debt will help mitigate future such liquidity crises while avoiding the distortionary effects of a FTT.

### *(3) International Substitution Effects*

The success of the FTT in raising revenues also depends critically on whether the overall volume of trading falls or whether it simply shifts to venues outside of the United States that are not subject to the tax. If a FTT merely forces market participants to conduct financial transactions in markets beyond the reach of U.S. fiscal authorities, then the FTT will fail to achieve either of its goals – it will neither reduce speculation nor will it succeed in generating significant revenue.

The price elasticity of demand for executing a financial transaction is higher when there are more substitute financial instruments and trading venues available that are not subject to the tax. In today's era of a globalized and electronic marketplace, derivatives transactions can be executed virtually anywhere in the world. And increasingly, so can securities transactions.

Cross-border differences in tax regimes have long been responsible for a wide range of international tax arbitrage and tax avoidance activities. Taxes paid at the source of a transaction (like FTTs) are especially vulnerable to cross-regime arbitrage. Value-added taxes ("VATs") in Europe, for example, were subject to significant cross-border arbitrage before the European Commission ("EC") harmonized member state tax codes and VAT rates. The "Martelange Factor" was a term used to describe European VAT arbitrage.<sup>52</sup> The name comes from a town on the border of Belgium and Luxembourg in which the main street lies in both countries. On the Luxembourg side of the street, goods were taxed at a 12% VAT. On the Belgian side, goods were taxed at 19%. Not surprisingly, the Belgian stores had great difficulty staying in business until EC tax harmonization occurred.<sup>53</sup>

The ease with which financial transactions can be executed across borders today makes U.S. financial markets much like Martelange. Both securities and derivatives can be executed with relative ease outside the United States. A FTT imposed here that is not simultaneously imposed in substantively the same form in every other major financial center (including the off-shore domiciles) will give rise to significant tax arbitrage activities.

International tax arbitrage is not possible, of course, for securities and derivatives that have no substitutes in regimes without FTTs. At the moment, for example, no significant securities exchange lists U.S. stocks for trading in U.S. dollars outside the United States. But the

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<sup>50</sup> See L. Zingales, "A Tax on Short-Term Debt Would Stabilise the System," *Financial Times* (December 17, 2009).

<sup>51</sup> See G. Gorton and A. Metrick, "Securitized Banking and the Run on Repo," *SSRN Working Paper* (July 28, 2009).

<sup>52</sup> R. Watson, "There's More to Tax than Martelange," *Euromoney* (September 1988).

<sup>53</sup> C. L. Culp, "Harmonizing the European Economic Community's VATs Through the Market," *Tax Notes International* Vol. 1, No. 1 (1989).

imposition of a FTT on equities would create a very strong incentive for such an exchange to be established.

A variety of economists have highlighted that if the FTT simply diverts financial transactions to a jurisdiction beyond the reach of U.S. tax laws, it will neither raise revenue nor reduce speculation:

- In November 2009, Gregory Mankiw of Harvard University commented in his blog: “Financial transactions are easy to move. If two parties to a financial contract can just as easily sign and enforce the contract in the Cayman Islands as in New York or London, there is little point in US or UK policymakers imposing a Tobin tax. Unless, of course, moving the finance industry offshore is the policy goal.”<sup>54</sup>
- Aswath Damodaran of New York University explained: “As trading moves off exchange floors into ether space, it is difficult to visualize how a transactions tax will work, unless it is globally coordinated. All you need is one rogue player for the system to start coming apart ... how long will it take for an offshore location (say the Cayman Islands) to set up a competitive system? (It will cost money but the potential benefits from the system will be huge.) Once that happens, any chance of regulating these markets, even in sensible ways, becomes remote.”<sup>55</sup>
- Luigi Zingales of The University of Chicago Booth School of Business commented: “[I]f not applied homogeneously throughout the world, [a FTT] will divert trading offshore. Do we really want all trading to move to Bermuda?”<sup>56</sup>

Indeed, U.K. Prime Minister Gordon Brown – a recent proponent of FTTs – has recognized the need for them to be global in order to work effectively: “Global [FTTs] will not be introduced unless all global financial centres are able to come behind them.”<sup>57</sup> Similarly, other supporters of FTTs recognize that FTTs not implemented globally will not be effective. For example, in 1999 Canada passed a resolution making its proposed introduction of a FTT on foreign exchange transactions conditional on the widespread adoption of such a FTT by other countries.<sup>58</sup> Similarly, in 2001, the French National Assembly voted to institute a FTT on all foreign exchange transactions, but only on the condition that every other European Union member nation do likewise.<sup>59</sup>

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<sup>54</sup> G. Mankiw, “Is a Tobin Tax Feasible?” Greg Mankiw’s Blog (November 27, 2009). (<http://gregmankiw.blogspot.com>)

<sup>55</sup> A. Damodaran, “A Tax on Financial Transactions: Good or Bad Idea?” Musings on Markets, November 27, 2009. (<http://aswathdamodaran.blogspot.com/2009/11/tax-on-financial-transactions-good-or.html>)

<sup>56</sup> Zingales, *op. cit.*

<sup>57</sup> T. Barber and G. Parker, “Taxing the Banks,” *Financial Times* (December 12, 2009).

<sup>58</sup> Fleming, *op cit.*

<sup>59</sup> *Id.* The French Senate overturned the parliament vote to adopt the conditional FTT on foreign currency transactions in December 2001. See, *Agence France-Presse, op cit.*

Recent European experience may portend the speed and magnitude at which the competitive conditions faced by U.S. exchanges might change if the U.S. unilaterally imposes a FTT. Specifically, multilateral trading facilities such as Turquoise, Bats Europe, and Chi-X Europe, which offer lower fees and faster trading than traditional exchanges have sprung up in Europe in recent years. Traditional stock exchanges such as the London Stock Exchange, NYSE Euronext, and Deutsche Börse AG are losing trading volume to those multilateral trading facilities.<sup>60</sup> For example, the London Stock Exchange's share of trading of FTSE 100 listed stocks fell from 77% to 60% in the year ending in October 2009; Chi-X Europe captured 23% of that trading.<sup>61</sup>

The empirical evidence on the impact of FTTs generally supports the notion that non-global FTTs cause trading to migrate to lower-tax jurisdictions or precipitate reductions in trading volume where they are imposed. Conversely, empirical evidence also supports the finding that reductions in FTTs tend to lead to an increase in trading volume. The evidence includes the following:

- Liu (2007) analyzed the impact of the reduction in the Japanese FTT rate from 0.55% to 0.30% in April 1989 and found that, "controlling for other factors that potentially have influence over trading volume, at the margin, the tax reform in April 1989 seems to have had a positive impact on the yen value of daily trading volume, consistent with the positive overall efficiency impact reported earlier."<sup>62</sup>
- Baltagi, Li, and Li (2006) analyzed the impact of a FTT rate increase from 0.3% to 0.5% on two stock markets in China and found that "trading volume decreases by 1/3."<sup>63</sup>
- Chou and Wang (2006) analyzed the impact of the reduction from 0.5% to 0.25% in the tax levied on futures transactions in Taiwan and concluded that "transaction taxes have a negative impact on trading volume and bid-ask spreads, as trading volume increased and bid-ask spreads decreased in the period following the reduction in the transaction tax."<sup>64</sup>
- Westerholm (2003) analyzed securities transaction tax changes in Sweden and Finland and concluded that "[r]ising transaction costs...have a negative impact on the turnover rate of shares while lower transaction costs have a positive impact on the turnover rate."<sup>65</sup>

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<sup>60</sup> N. Sukumar, "LSE Enters Exclusive Discussions with Rival Turquoise (Update 1)," *Bloomberg.com* (October 1, 2009).

<sup>61</sup> V. Guevarra, "Rising Competition Hurts LSE Results," *WSJ.com* (November 25, 2009).

<sup>62</sup> Liu, *op. cit.*, p. 173.

<sup>63</sup> Baltagi et al., *op. cit.*, p. 393.

<sup>64</sup> R. Chou and G. Wang, "Transaction Tax and Market Quality of the Taiwan Stock Index Futures," *Journal of Futures Markets* Vol. 26, No. 12 (2006), p. 1195.

<sup>65</sup> Westerholm, *op. cit.*, p. 226.

- Chou and Lee (2002) analyzed the impact of the transaction tax reduction from 5 to 2.5 basis points on the Taiwan Futures Exchange (“TAIFEX”) in May 2000. They observed that “although SGX [Singapore Exchange] is an offshore market for Taiwan stock index futures, it is more active than the local market.”<sup>66</sup> They also found that TAIFEX volume almost doubled in the second period while that on SGX increased only mildly, which “is likely to be explained by the reduction in the transaction tax...”<sup>67</sup>
- Hu (1998) failed to find that FTT tax rates affected transaction volume in Asian markets in the period from 1975 to 1994, but concluded that was attributable to financial regulation in those markets during that period. More specifically, Hu analyzed the impact of FTT rate changes in Hong Kong, Japan, Korea, and Taiwan and found “no significant effect on ... market turnover.”<sup>68</sup> He attributed this result to the highly regulated nature of capital markets in these countries at that time, concluding that “there is very limited migration possibility in trading in the Asian sample” and “it seems that migration possibility is a necessary condition for us to observe a reduction in turnover following a tax increase.”<sup>69</sup>
- Campbell and Froot (1993) analyzed the impact of the imposition of, and changes in, Sweden’s FTT. Sweden imposed a FTT of 1% (round-trip) on certain equity transactions in 1984 and subsequently raised the rate to 2%. Stock options were taxed at 2% (round-trip) of option premium. The FTT was also subsequently expanded in scope to cover fixed-income securities, including government debt and related derivatives such as interest-rate futures and options. The rates on these instruments varied, with a maximum rate of 0.15% of the underlying notional or cash amount.<sup>70</sup> Sweden reduced and then abolished these taxes in 1990-91. The authors found that while the share of trading in Swedish listed firms fell following the imposition of the tax, trading in bonds and futures on bonds was more severely impacted (falling more than 85 percent for bonds and 98 percent for futures in the first week following imposition of the tax). These effects were reversed when the FTT was eliminated in 1990 and 1991.<sup>71</sup> Campbell and Froot explained that the Swedish fixed-income market was more severely impacted than the stock market due to the relative ease with which substitutes for bonds can be created. They concluded that “[b]ecause trade in fixed-income securities can move so easily into debentures and forward contracts, the

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<sup>66</sup> R. Chou and J. Lee, “The Relative Efficiencies of Price Execution Between the Singapore Exchange and the Taiwan Futures Exchange,” *Journal of Futures Markets* Vol. 22, No. 2 (2002), p. 184.

<sup>67</sup> *Id.*

<sup>68</sup> Hu, *op. cit.*, p. 347.

<sup>69</sup> *Id.*, p. 363.

<sup>70</sup> By comparison, the Harkin bill would tax derivatives at a rate of 0.25%. The Harkin FTT thus would tax fixed-income derivatives at a much higher rate than the Sweden FTT.

<sup>71</sup> Campbell and Froot, *op. cit.*, pp. 8-9.

turnover tax raised little revenue, and a good deal less than the authorities expected.”<sup>72</sup> Umlauf (1993) also studied the impact of Sweden’s FTT and found similar results.<sup>73</sup>

- Campbell and Froot (1993) also analyzed the impact of the United Kingdom’s FTT. The U.K. imposes a stamp duty that applies to transactions in ordinary shares (*i.e.*, common stock) and assets convertible to shares, such as convertible bonds. Stamp duty “is effectively a tax on registration, the transfer of legal ownership of UK shares.”<sup>74</sup> In contrast, the Swedish FTT studied by Campbell and Froot is a tax on transactions. Campbell and Froot found that the U.K. stamp tax reduced trading volume, but less dramatically than the Swedish FTT. They concluded that “an STT [securities transaction tax] along British lines would be far more workable than a Swedish-style STT”, but “[e]ven a British-style STT...would likely lead to major behavioral changes....”<sup>75</sup> Campbell and Froot explained that, in the U.K., the stamp duty generated an incentive for investors to use nominees to hold assets in their name<sup>76</sup> and, more generally, an incentive for the creation of “bearer instruments” that can be traded without using registration services.<sup>77</sup>

A recent study by Sahu (2008) of the impact of India’s introduction of a FTT in October 2004 on seven frequently-traded stocks listed on the National Stock Exchange found a more ambiguous impact on trading volume.<sup>78</sup> Four of the stocks experienced reductions in trading volume, while the other three experienced increases, and Sahu thus concluded that average turnover was unaffected.

As discussed above, FTTs increase the costs of engaging in financial transactions. As such, economic studies of *non*-FTT financial transactions costs also provide evidence about the likely impact of an FTT on trading activity. These studies generally document a negative impact of non-FTT transactions costs on volume, and the authors of these studies often use these results to analogize to the potential effect of a transactions tax.

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<sup>72</sup> *Id.*, pp. 9-10.

<sup>73</sup> S. Umlauf, “Transaction Taxes and the Behavior of the Swedish Stock Market,” *Journal of Financial Economics* Vol. 33, No. 2 (1993).

<sup>74</sup> Campbell and Froot, *op. cit.*, p. 12.

<sup>75</sup> *Id.*, p. 3.

<sup>76</sup> The British tax authorities responded by distinguishing between “custodial nominees” that perform the regular functions of custodians and “active nominees” that, in addition to providing traditional custodial services, may also transfer assets between customer accounts. Transfers of shares into the name of an active nominee were taxed at three times the ordinary rate.

<sup>77</sup> Campbell and Froot, *op. cit.*, gave the example of shares in Eurotunnel, which were issued in both the U.K. and France. But whereas the U.K. shares were registered in the usual way, the French shares were bearer instruments. The British tax authorities imposed a triple stamp duty on the conversion of U.K. registered shares to French bearer shares.

<sup>78</sup> Sahu, *op. cit.*

- Aliber, Chowdhry, and Yan (2003) examined the relationship between transactions costs and trading volume on four foreign currency markets (the British pound, the Deutsche mark, the Japanese yen, and the Swiss franc) over the period from 1977 through 1999 and documented that “volume is negatively associated with the level of transactions costs,” which is “consistent with the notion that an increase in transactions costs does indeed lead to a reduction in volume of trading as one might expect....”<sup>79</sup>
- Wang and Yau (2000) examined the impact of the bid-ask spread on trading volume for two financial futures contracts (S&P 500 and Deutsche mark) and two metal futures contracts (silver and gold) over the period January 1990 through April 1994. They found a negative relation between the bid-ask spread and trading volume, which indicates that “a transaction tax, which is analogous to a greater bid-ask spread, will reduce trading volume, although the reduction is not as great as we previously estimated.”<sup>80</sup>

The recent experience of Brazil provides further evidence that FTTs result in trade migration to low-tax jurisdictions. Brazil imposed a FTT of 2.0% on all foreign portfolio investments in the country in October 2009 and, as a result, foreign investors responded by buying Brazilian ADRs in New York and converting them into locally-issued shares, thereby avoiding the tax.<sup>81</sup> In response, the Brazilian government placed a 1.5% tax on ADRs of Brazilian companies. Brazil’s Finance Minister Guido Mantega explained: “When we implemented the IOF [the 2% tax], there was concern at the Brazilian stock exchange that we would be transferring some investments to New York... We are equalizing the situation.”<sup>82</sup>

The response to the imposition of the U.K. Stamp Duty also demonstrates how the claimed benefits of FTTs can be overstated by diverting trading to untaxed financial instruments. To the extent that the taxed and untaxed instruments are close substitutes, the FTT can have little or no effect on speculation or volatility but, at the same time, would fail to generate significant revenue. More specifically, avoidance of the U.K. Stamp duty on transfers of securities is one of the factors underlying the surge in recent years in contracts-for-difference (“CFD”) trading in the U.K. A CFD is a cash-settled derivatives contract that gives participants an economic exposure (short or long) to a specific share price over the contract’s life. CFDs are established by reference to individual securities and generate cash flows based on price changes in the

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<sup>79</sup> R. Aliber, B. Chowdhry and S. Yan, “Some Evidence that a Tobin Tax on Foreign Exchange May Increase Volatility,” *European Finance Review* Vol. 7, No. 3 (2003), p. 482.

<sup>80</sup> G. Wang and J. Yau, “Trading Volume, Bid-Ask Spread, and Price Volatility in Futures Markets,” *Journal of Futures Markets* Vol. 20, No. 10, (2000), p. 944.

<sup>81</sup> See, e.g., J. Wheatley and A. Beattie, “Brazil Imposes Tax on Foreign Investments,” *FT.com* (October 20, 2009), and Reuters, “Brazil Unveils New Tax to Curb Capital Inflows,” [www.guardian.co.uk](http://www.guardian.co.uk) (November 18, 2009).

<sup>82</sup> Reuters, “Brazil Unveils ...,” *op. cit.*

underlying security. But because they are cash-settled derivatives, no transfer of the underlying security ever occurs. As a result, no stamp duty is payable.<sup>83</sup>

The total value of CFD transactions has grown from around 10% of the value of U.K. domestic equity transactions in 2001 to approximately 35% in 2007.<sup>84</sup> In 2008, the London Stock Exchange planned to organize a market for CFD trading, but indefinitely postponed its plan in April 2009 after failing to generate sufficient support from capital-constrained dealers.<sup>85</sup> The U.K. stamp duty generated £4.17 billion (\$7.87 billion)<sup>86</sup> from share trading in 2008, but “this is set to fall sharply because not only have hundreds of thousands shied away from the stock market, but those that have remained investors have shifted to other products such as bonds, which do not attract any tax.”<sup>87</sup>

In sum, the economic literature and recent history indicates that the revenue potential of FTTs depends critically on the potential impact of a FTT on trading volume. As the empirical evidence indicates, FTTs can materially alter the revenue potential by impacting the trading volume of the asset subject to the FTT. As mentioned earlier, Rep. DeFazio projects that the proposed FTT would raise \$150 billion in tax revenue per annum (without providing any detail or basis for that projection). Proper evaluation of the DeFazio proposal requires a thorough explanation of the methodology that underlies this estimate, including the assumptions about how the proposed FTT would affect trading volume.

## V. SPECULATION, VOLATILITY, AND FTTs

Prices in securities and derivatives markets are socially valuable signals that help direct resources to their most highly valued uses.<sup>88</sup> As such, another oft-claimed benefit of FTTs is that they discourage financial transactions that interfere with or reduce the “informational efficiency” of markets.<sup>89</sup> In other words, FTTs would seem justified to the extent that they reduce certain types of trading activities thought to interfere with the price discovery process – generally all lumped under the rubric of “speculation.” As discussed below, however, the

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<sup>83</sup> Financial Services Authority, *Disclosure of Contracts of Difference: Consultation and Draft Handbook Text* (November 2007), pp. 11-12.

<sup>84</sup> *Id.*, p. 13.

<sup>85</sup> See, M. Waller, “LSE Planning to Offer Organised Market in CFDs by End of Year,” *Times Online* (January 11, 2008); and TABB Group, “High-Frequency Trading and Capital-Constrained Dealers Scuttled LSE’s Exchange-Traded Contracts for Difference (CFDs), Says TABB Group,” press release (July 20, 2009).

<sup>86</sup> In 2008, the exchange rate was £1 = US\$0.53. *Statistical Abstract of the United States*, Table 1361 (2010).

<sup>87</sup> H. Wallop, “Stamp Duty Revenue Falls as Investors Flee Stock Market, HMRC Figures Show,” [www.telegraph.co.uk](http://www.telegraph.co.uk) (January 31, 2009).

<sup>88</sup> See, e.g., F. A. Hayek, “The Use of Knowledge in Society,” *American Economic Review* Vol. 35, No. 4 (1945).

<sup>89</sup> See, e.g., E. F. Fama, “Efficient Capital Markets: A Review of Theory and Empirical Work,” *Journal of Finance* Vol. 25, No. 2 (1970), and E. F. Fama, “Efficient Capital Markets: II,” *Journal of Finance* Vol. 46, No. 5 (1991).

available economic evidence does not support the claim that FTTs improve the informational efficiency of financial markets.

#### A. What is “Speculation”?

According to the Commodity Futures Trading Commission (“CFTC”), a “speculator” is “an individual ... who trades with the objective of achieving profits through the successful anticipation of price movements.”<sup>90</sup> Also known as “proprietary trading,” speculation implies the deliberate assumption of risk in order to try and earn an above-market return.

If a trader has an opinion about the direction that wheat prices are headed, for example, trading wheat futures is a simple, low-cost way to make a bet on that belief. Futures also usually have the advantage of significant depth and liquidity, so that if the trader’s opinion changes it is easy to get out of the original trade. Similarly, the low cost and high liquidity of futures makes them natural arenas for trading activities by firms with short trading horizons, such as day traders and scalpers.

Despite the prevalence of speculation in futures markets for centuries, the practice is often viewed with skepticism or cynicism. The line between “investing” and “speculating,” moreover, is blurry. The sale of a stock that someone has been holding because of a belief that the price will fall can be considered a form of speculation. And for that matter, many individuals and asset managers that *buy* stocks are “speculating” that the price will rise.

Speculation and related activities perform several important benefits to financial market participants. In securities and derivatives markets alike, speculators bring additional volume to the market that adds to liquidity and market depth. Those, in turn, lower transaction costs and lessen the potentially disruptive price impacts of large buy and sell orders.

In derivatives markets, speculators can facilitate price discovery, or the process by which markets incorporate new information into prices. Because speculators in derivatives markets also enhance the “hedge load” of a market – *i.e.*, the proportion of traders available to assume the risks that hedgers are attempting to get rid of – they play an important role in helping corporations and other end users of derivatives reduce their costs of managing risk.<sup>91</sup>

In equity markets, speculative short sellers are often the focus of most attention and distrust.<sup>92</sup> Yet, speculative short selling also can play an important informational role in equity markets by helping to correct irrational overpricing when it occurs. In other words, without speculative

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<sup>90</sup> [http://cftc.gov/educationcenter/glossary/glossary\\_s.html](http://cftc.gov/educationcenter/glossary/glossary_s.html).

<sup>91</sup> See C. L. Culp, *Risk Transfer: Derivatives in Theory and Practice* (New York, N.Y.: John Wiley & Sons, 2004).

<sup>92</sup> Even more vilified are “naked” short sellers who neither own nor have planned to borrow the shares they are selling. But in fact, naked short selling is little different economically than traditional short selling. See C. L. Culp and J. B. Heaton, “The Economics of Naked Short Selling,” *Regulation* Vol. 31, No. 1 (2008).

short sales, stock prices tend to be biased toward the belief of only the most optimistic investors. That can lead to the formation (and eventual collapse) of bubbles.<sup>93</sup>

Perhaps the main criticism leveled against speculators is that they interfere with the operation of price formation in markets by adding “noise.”<sup>94</sup> The long-standing nature of these concerns is reflected in President Harry S. Truman’s comments in 1947 about speculation in futures markets:

Another factor that contributes to high prices of food is gambling in grain. Grain prices naturally respond to the law of supply and demand, but they should not be subject to the greed of speculators who gamble on what may lie ahead in our commodity markets....I am instructing the commodity exchange commission...that they increase their margin requirements....If the grain exchanges refuse, the government may find it necessary to limit the amount of trading. I say this because the cost of living in this country must not be a football to be kicked about by gamblers in grain.<sup>95</sup>

## B. Speculation and Volatility in General

Merton Miller (a University of Chicago economist and winner of the 1990 Nobel Memorial Prize in Economic Sciences) explained that, to academics, volatility refers to the risk incurred by an investor by holding a particular asset (*e.g.*, equities, bonds, real estate) and can be measured by calculating the variability of the price or rate of return on the asset. The first sense in which speculative activity is thought to increase “volatility” is through more variability in asset prices or returns.<sup>96</sup>

Miller further emphasized that for many practitioners, however, volatility refers not to price dispersion but rather to the speed at which some trading and price changes occur. Miller explained that such critics of speculation worry about the *velocity* of price changes, not the true volatility of prices. FTTs thus are viewed by some as valuable because they reduce the velocity of financial markets.

A third sense in which the term volatility is sometimes used refers to the potential for market prices to “overshoot” their intrinsic values based on economic fundamentals (*e.g.*, supply and demand). Here the question is whether speculation causes market prices to soar higher than

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<sup>93</sup> See, *e.g.*, E. Miller, “Risk, Uncertainty, and Divergence of Opinion,” *Journal of Finance* Vol. 32, No. 4 (1977); J. Harrison and D. Kreps, “Speculative Investor Behavior in a Stock Market with Heterogeneous Expectations,” *Quarterly Journal of Economics* Vol. 92, No. 2 (1978); D. Diamond and R. Verrechia, “Constraints on Short-Selling and Asset Price Adjustment to Private Information,” *Journal of Financial Economics* Vol. 18, No. 2 (1987); H. Hong and J. Stein, “Differences of Opinion, Short-Sales Constraints, and Market Crashes,” *Review of Financial Studies* Vol. 16, No. 2 (2003); J. Scheinkman and W. Xiong, “Overconfidence and Speculative Bubbles,” *Journal of Political Economy* Vol. 111, No. 6 (2003); and H. Hong, J. Scheinkman, and W. Xiong, “Asset Float and Speculative Bubbles,” *Journal of Finance* Vol. 61, No. 3 (2006).

<sup>94</sup> See, *e.g.*, F. Black, “Noise,” *Journal of Finance* Vol. 41, No. 3 (1986).

<sup>95</sup> In Henry H. Bakken, *Theory of Markets and Marketing* (Madison, WI: Mimir Publishers, Inc., 1953).

<sup>96</sup> M. Miller, “Index Arbitrage and Volatility,” *Financial Analysts Journal* Vol. 46, No. 4 (1990).

dictated by fundamentals, only to eventually crash possibly below the level dictated by economic fundamentals (or conversely).

### C. FTTs and Excess Price Variability

When volatility is interpreted in terms of the variability of the price or rate of return of an asset, there is no systematic consensus evidence in the academic literature that speculation increases volatility.

Theoretical models can be constructed which predict that FTTs decrease volatility,<sup>97</sup> but other models can also be constructed which predict FTTs will increase volatility.<sup>98</sup> Yet other theoretical models suggest that the impact of FTTs on volatility may be either positive or negative depending on the size and liquidity of the market.<sup>99</sup> So, the impact of speculation and FTTs on price volatility cannot be resolved based on economic theory alone.

Empirical studies of the impact of FTTs, however, do not generally support proponents' claims that FTTs will reduce market price variability. In fact, the studies generally find either no effect on volatility or find that increases (decreases) in FTT tax rates have been followed by an increase (decrease) in price variability.

- Phylaktis and Aristidou (2007) examined the impact of a FTT on the Athens Stock Exchange ("ASE") and found that "the transaction tax increases volatility during bull periods, when the objective is to reduce volatility and excessive trading and decreases volatility during bear periods, when the objective should be to support and boost liquidity and volatility" and thus "the use of transaction taxes, at least in the ASE, has not had the desired effect on volatility...."<sup>100</sup>

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<sup>97</sup> For example, Bianconi et al. (2009) demonstrated that "the introduction of Tobin taxes in agent-based models of currency markets can lead to a reduction of both speculative trading and the magnitude of exchange rate fluctuations at intermediate tax rates." G. Bianconi, T. Galla, M. Marsili and P. Pin, "Effects of Tobin Taxes in Minority Game Markets," *Journal of Economic Behavior and Organization* Vol. 70, Nos. 1-2 (2009), p. 231.

<sup>98</sup> For example, Kupiec (1996) showed that "the volatility of risky asset returns unambiguously increases with the level of the transactions tax." P. Kupiec, "Noise Traders, Excess Volatility, and a Securities Transactions Tax," *Journal of Financial Services Research* Vol. 10, No. 2 (1996), p. 115.

<sup>99</sup> For example, Song and Zhang (2005) find that "in countries with lower volatility and smaller participation of noise traders (as in many emerging markets), an increase in an STT [securities transaction tax] may help reduce the security volatility" and "in markets with relatively higher volatility and large noise trader participation, using an STT aggressively may bring the opposite effect on volatility, contrary to what regulators have expected." F. Song and J. Zhang, "Securities Transaction Tax and Market Volatility," *Economic Journal* Vol. 115, No. 506 (2005), p. 1119. See also K. Shi and J. Xu, "Entry Cost, the Tobin Tax, and Noise Trading in the Foreign Exchange Market," *Canadian Journal of Economics* Vol. 42, No. 4 (2009), who argue that a Tobin tax "will discourage the entry of all traders [both informed traders and noise traders], so they may not change the relative ratio of traders, or they may affect informed traders more, which increases the relative ratio of noise traders and exchange rate volatility." (p. 1501)

<sup>100</sup> Phylaktis and Aristidou, *op. cit.*, p. 1466.

- Chou and Wang (2006) examined the impact of the reduction from 5 to 2.5 basis points in the tax levied on futures transactions in Taiwan and found that the evidence “is not consistent with the argument that the imposition of a transaction tax may reduce price volatility because there are no significant changes in price volatility after the tax reduction.”<sup>101</sup>
- Baltagi, Li, and Li (2006) examined the impact of a stamp tax rate increase from 0.3% to 0.5% on two stock markets in China and found that “volatility significantly increases after the increase in the tax rate,” which “indicates that the markets become less efficient in the sense that shocks are less quickly assimilated in the markets.”<sup>102</sup>
- Westerholm (2003) examined securities transaction tax changes in Sweden and Finland and concluded: “Volatility in securities prices is significantly reduced when transactions costs decrease.”<sup>103</sup> This implies that FTTs that increase transactions costs will increase volatility.
- Green, Maggioni, and Murinde (2000) examined the impact of two types of transactions costs (stamp duty and brokerage charges) on share price volatility on the London Stock Exchange over the period from 1870 through 1986 (when minimum commissions were abolished). They concluded: “All transactions costs variables have uniformly positive signs in the market volatility and excess volatility equations. Given that increased transaction costs presumably reduce trading, these results are consistent with the evidence of Jones and Seguin (1997) and Umlauf (1993) that increased transaction costs will increase volatility through a thin trading effect.”<sup>104</sup>
- Hu (1998) examined the impact of securities transaction tax changes over the period from 1975 through 1994 in Hong Kong, Japan, Korea, and Taiwan and concluded that “the evidence is not consistent with the hypothesis that stock transaction tax can reduce noise trading and volatility.”<sup>105</sup>
- Saporta and Khan (1997) examined the impact of changes in U.K. stamp duty rates and concluded that “there is no stamp duty effect on UK equity volatility...”<sup>106</sup>

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<sup>101</sup> Chou and Wang, *op. cit.*, pp. 1195-96.

<sup>102</sup> Baltagi, Li and Li, *op. cit.*, p. 393.

<sup>103</sup> Westerholm, *op. cit.*, p. 213.

<sup>104</sup> C. Green, P. Maggioni, and V. Murinde, “Regulatory Lessons for Emerging Stock Markets from a Century of Evidence on Transactions Costs and Share Price Volatility in the London Stock Exchange,” *Journal of Banking and Finance* Vol. 24, No. 4 (2000), p. 591, citing Umlauf, *op. cit.*, and C. Jones and P. Seguin, “Transactions Costs and Price Volatility: Evidence from Commission Deregulation,” *American Economic Review* Vol. 87, No. 4 (1997).

<sup>105</sup> Hu, *op. cit.*, p. 347.

<sup>106</sup> Saporta and Kan, *op. cit.*, p. 10.

- Umlauf (1993) examined the impact of securities transactions taxes on the Swedish equity market over the period from 1980 through 1987 and found that “volatility in Sweden did not decline during high tax rate regimes.”<sup>107</sup> He also found that the FTT resulted in a migration of trading volume in the 11 most actively traded Swedish shares classes and “the volatilities of London-traded share classes fell in comparison with those of their companies’ Stockholm-traded classes,” which suggests that “all else being equal, taxes increase volatility.”<sup>108</sup>
- Roll (1989) examined the relationship between transaction taxes and market volatility across countries and concluded: “Transaction taxes are inversely but insignificantly correlated with volatility across countries, and the effect is too questionable for taxes to be used with confidence as an effective policy instrument.”<sup>109</sup>

Sahu (2008) studied the effect of India’s introduction of a FTT in October 2004 on seven frequently-traded stocks listed on the National Stock Exchange.<sup>110</sup> Contrary to the findings of most the literature discussed above, Sahu found a marginal (albeit statistically significant) decline in volatility.

The impact of changes in non-FTT transactions costs on market volatility also has received considerable attention in the economic literature. Authors of these studies often make inferences about the impact of FTTs on volatility based on analysis of non-FTT transactions costs. These studies also generally fail to find any systematic relationship between transactions costs and volatility:

- Lanne and Vesala (2009) examined the impact of transactions costs (measured by the bid-ask spread) on foreign exchange markets over the period from October 1992 through September 1993. They found that “increases in transaction costs (which proxy the presumable effect of a transaction tax) lead to increased volatility in the foreign exchange market” and commented that their findings “are bad news to proponents of the Tobin tax whose main argument has been that a transaction tax on foreign exchange would decrease volatility.”<sup>111</sup>
- Sahoo and Kumar (2008) studied the relationship between bid-ask spreads and volatility for five commodities traded on India’s Multi-Commodity Exchange: gold, copper, petroleum,

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<sup>107</sup> Umlauf, *op. cit.*, p. 228.

<sup>108</sup> *Id.*

<sup>109</sup> R. Roll, “Price Volatility, International Market Links, and Their Implications for Regulatory Policies,” *Journal of Financial Services Research* Vol. 3, Nos. 2-3, (1989), p. 241.

<sup>110</sup> Sahu, *op. cit.*

<sup>111</sup> M. Lanne and T. Vesala, “The Effect of a Transaction Tax on Exchange Rate Volatility,” *International Journal of Finance and Economics* (2009), pp. 9-10.

refined soya oil, and chick peas. They documented “a positive relationship between transaction cost and volatility” and concluded that “if the government imposes CTT [commodity transaction tax], it would lead to higher volatility and lower trading activity affecting market efficiency and liquidity.”<sup>112</sup>

- Hau (2006) examined the impact of tick size (a measure of transactions costs) on volatility on the Paris Bourse and reported that “the effect of transaction costs on volatility is positive and significant, both statistically and economically,” which suggests that “a security transaction tax should be deemed counterproductive.”<sup>113</sup>
- Aliber, Chowdhry, and Yan (2003) examined the relationship between transactions costs and volatility on four foreign currency markets over the period from 1977 through 1999. They found that “volatility is positively associated with the level of transactions costs,” which suggests that the effect of transactions costs on volatility “is exactly opposite of what proponents of Tobin tax would have liked to see.”<sup>114</sup>
- Wang and Yau (2000) examined the impact of the bid-ask spread on price volatility for two financial futures contracts (S&P 500 and Deutsche mark) and two metal futures contracts (silver and gold) over the period January 1990 through April 1994. They documented a positive relationship between the bid-ask spread and price volatility. Because a transaction tax “is analogous to a greater [bid-ask spread],” the results suggest that a FTT will be associated with higher price volatility.<sup>115</sup>
- Atkins and Dyl (1997) examined the relationship between volatility and bid-ask spreads on the New York Stock Exchange during the period from 1975 through 1989 and found that “volatility is actually associated with high transaction costs,” which “suggests that the effect of [a securities transactions tax] may be to impede the adjustment of stock prices to new information, rather than curb ‘excessive short-term speculation’.”<sup>116</sup>
- Jones and Seguin (1997) examined the impact of the May 1, 1975, introduction of lower negotiated commissions on the NYSE and AMEX and found that “a reduction in transaction costs is associated with a decline in stock return volatility.”<sup>117</sup> They concluded that their

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<sup>112</sup> Sahoo and Kumar, *op. cit.*, p. ii.

<sup>113</sup> H. Hau, “The Role of Transaction Costs for Financial Volatility: Evidence from the Paris Bourse,” *Journal of the European Economic Association* Vol. 4, No. 4 (2006), p. 888.

<sup>114</sup> Aliber, Chowdhry and Yan, *op. cit.*, p. 482.

<sup>115</sup> Wang and Yau, *op. cit.*, p. 967.

<sup>116</sup> A. Atkins and E. Dyl, “Stock Price Volatility, Transactions Costs and Securities Transactions Taxes,” *Managerial and Decision Economics* Vol. 18, Nos. 7-8 (1997), p. 709.

<sup>117</sup> Jones and Seguin, *op. cit.*, p. 729.

results (together with Umlauf's study of the impact of FTTs on the Swedish stock market<sup>118</sup>) "suggest that the logic of increasing transaction taxes to reduce the impact of noise traders and, therefore, to reduce volatility, does not withstand empirical scrutiny."<sup>119</sup>

- Nordén (2009), however, found a contrary result. He examined the impact of the OMX Nordic Exchange's 22% reduction in its exchange fee for trading the OMXS 30 index futures and found that trading volume increased by 19%, bid-ask spreads fell by 27%, and volatility rose by 27%, leading to the conclusion that the exchange fee reduction "has improved futures market liquidity at the cost of higher volatility."<sup>120</sup>

#### D. Velocity of Market Adjustments and FTTs

Although most studies suggest that a FTT would not decrease price *variability*, the imposition of a FTT might nevertheless reduce the *velocity* at which prices adjust to new information. Ironically, a FTT that decreases market efficiency may *benefit* speculators by increasing opportunities to trade at less-informative prices.<sup>121</sup>

##### (1) *General Empirical Evidence*

The economic studies that have analyzed the relation between FTTs and the velocity of transactions prices typically find that FTTs reduce the speed of price adjustment:

- Liu (2007) examined the impact of the Japanese FTT rate reduction from 0.55% to 0.30% in 1989 on the adjustment speed of Tokyo Stock Exchange-listed stocks to new information and concluded: "To the extent that the first-order autocorrelation coefficient is an indicator of the efficiency of the price discovery process, as conventionally assumed in the literature, these findings indicate that the April 1989 tax event [a reduction in the FTT] increased the efficiency of the Japanese equity market."<sup>122</sup>
- Baltagi, Li, and Li (2006) examined the impact of the Chinese stamp tax rate increase from 0.3% to 0.5% in May 1997 on persistence of shocks to market volatility. They found that "volatility shocks are less quickly assimilated in the stock markets after the event [the stamp tax rate increase], i.e., the markets become less efficient."<sup>123</sup> They explained: "Raising the transaction cost discourages trades that take advantage of asset mispricing. As the

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<sup>118</sup> Umlauf, *op. cit.*.

<sup>119</sup> Jones and Seguin, *op. cit.*, p. 736.

<sup>120</sup> L. Nordén, "A Brighter Future with Lower Transactions Costs?" *Journal of Futures Markets* Vol. 29, No. 8 (2009), p. 775.

<sup>121</sup> J. Dow and R. Rahi, "Should Speculators Be Taxed?" *Journal of Business* Vol. 73, No. 1 (2000).

<sup>122</sup> Liu, *op. cit.*, p. 171. (footnote omitted)

<sup>123</sup> Baltagi, Li, and Li, *op. cit.*, p. 406.

transaction cost increases, the market fails to respond to the arrived information as promptly as before, which leads to a less efficient market.”<sup>124</sup>

- Hsieh (2004) examined the effect of the reduction in the Taiwan futures transfer tax rate from 0.05% to 0.025% in May 2000. This reduction had the effect of lowering transaction costs on the TAIFEX to the same level as on the SGX, which listed similar contracts for trading. Hsieh found that the tax reduction improved the speed at which prices adjusted. He found that the “lowered trading costs ... enhanced the information role of the market” and concluded that “in order to enhance price discovery, an exchange should adopt a policy that directly reduces transaction costs.”<sup>125</sup>
- Chou and Lee (2002) also examined the transaction tax rate reduction at TAIFEX from 5 to 2.5 basis points and found that “the amount of information and the speed of information also improved.”<sup>126</sup> They concluded that “a reduction in the transaction tax greatly improves the efficiency of the futures market.”<sup>127</sup>

Sahu (2008) analyzed the effect of India’s introduction of a FTT in October 2004 on seven frequently-traded stocks listed on the National Stock Exchange.<sup>128</sup> Contrary to the findings of most the literature discussed above, Sahu found that the informational efficiency of the markets for these seven stocks was not affected.

## (2) High-Frequency Trading

Firms that engage in algorithmic and high-frequency trading (“HFT”) have contributed to significant growth in trading volume across many markets in recent years. That trend has been viewed with skepticism by some who suggest that it creates disadvantages for small investors and contributes to excess price velocity. As the example discussed in Section III.B of the effect of a FTT on the cost of Eurodollar trading suggests, FTTs would result in large increases in costs to high-frequency traders and would likely drive such firms out of the U.S. financial markets.

No consensus exists today among financial market participants and academics on the benefits and costs of HFT,<sup>129</sup> and an evaluation of the impact of HFT on the efficiency of financial

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<sup>124</sup> *Id.*

<sup>125</sup> W. Hsieh, “Regulatory Changes and Information Competition: The Case of Taiwan Index Futures,” *Journal of Futures Markets* Vol. 24, No. 4 (2004), p. 411.

<sup>126</sup> Chou and Lee, *op. cit.*, p. 195.

<sup>127</sup> *Id.*

<sup>128</sup> Sahu, *op. cit.*

<sup>129</sup> *Cf.* “The Impact of High-Frequency Trading: Manipulation, Distortion or a Better-Functioning Market?” (September 30, 2009) (<http://knowledge.wharton.upenn.edu/article.cfm?articleid=2345>) and B. Malkiel and G. Sauter, “A Transaction Tax Would Hurt All Investors,” *Wall Street Journal* (December 9, 2009) (contending that “[f]ar from destabilizing or creating volatility in the market, [high frequency traders’] actions significantly increase trading volume, reduce spreads, promote price-discovery, and ultimately reduce transactions costs for long-term investors.”)

markets is well beyond the scope of this paper. Although the relation between the growth of HFT and financial market performance is likely to continue to generate significant research interest, there are few studies of HFT that have appeared to date, and those which have been written reach conflicting conclusions about the effect of HFT on volatility and market efficiency.<sup>130</sup> Consider two examples:

- Hendershott, Jones, and Menkveld (2009) analyzed a sample of NYSE stocks over the period from February 2001 through December 2005 and concluded: “For large stocks in particular, algorithmic trading narrows spreads by reducing adverse selection and increasing the amount of information in quotes as compared to trades. These indicate that algorithmic trading does causally improve liquidity and enhances the informativeness of quotes and prices.”<sup>131</sup>
- Quantitative Services Group (2009) analyzed QSG client trading data for the period between January 1, 2009 and October 23, 2009 and found that, especially for liquid, low price stocks, certain HFT strategies have contributed to increased trading costs.<sup>132</sup>

Because HFT occurs at margins far smaller than the proposed 25 basis point tax on stock transactions,<sup>133</sup> the proposed FTT would likely make HFT unprofitable in the United States. The reduction in trading volume from the proposed FTT depends on the percentage of trading by high-frequency traders. By some accounts, HFT accounts for more than 50% and possibly more than 70% of equity trading in the U.S.<sup>134</sup> Similarly, HFT is estimated to account domestically for

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<sup>130</sup> Although we are unaware of any economic studies documenting that the growth of HFT contributed to the credit crisis, some politicians have nevertheless made such claims. For example, one financial press article reported: “Some traders like Joe Saluzzi of Themis Trading, and some in Washington, including Sens. Charles Schumer (D., N.Y.) and Ted Kaufman (D., Del.) argued high frequency trading was one of the contributing factors to the 2008 market crash. Noting high-frequency groups make up the majority of the market’s volume, critics say these traders stopped trading when the market began to fall last year, making declines more violent.” See G. Rogow, “Despite Critics, High-Frequency Trading Likely Won’t Be Curbed,” *Dow Jones Newswires* (December 2, 2009).

<sup>131</sup> T. Hendershott, C. Jones, and A. Menkveld, “Does Algorithmic Trading Improve Liquidity?” *SSRN Working Paper* (February 5, 2009), abstract.

<sup>132</sup> Quantitative Services Group, *Beware of the VWAP Trap* (November 2009).

<sup>133</sup> Quantitative Services Group, *op. cit.*, stated that the majority of profits on HFT strategies “are made on razor thin margins” and “market makers are often executing trades with gross margins of 0.05% or nominally between one and two-tenths of a penny.” (p. 2) Note, however, that these “razor thin margins” are nevertheless considerably larger than the 0.0033% SEC fee currently imposed.

<sup>134</sup> Quantitative Services Group, *op. cit.*, reported: “The prevailing estimates of the daily volume of HFT strategies now range between 50% and 70% of daily volume in the US.” (p. 3) On October 28, 2009, Daniel Mathisson, managing director of Credit Suisse, testified before a congressional committee that “estimates of high-frequency trading range from 10% up to 60% of the volume” and that “Credit Suisse believes the lower bound seems to be closer to the truth, but the lack of a formal definition makes it impossible to estimate what percentage of the marketplace they make up, or to perform any rigorous quantitative analysis to evaluate their effects.” See D. Mathisson, *Prepared Statement Before the Senate Committee on Banking, Housing, and Urban Affairs* (October 28, 2009).

up to 40% of futures trading volume, up to 20% of options trading volume, and 10% of foreign exchange trading volume.<sup>135</sup> The likely impact of the proposed FTT on HFT and total trading volumes – as well as the financial health of organized exchanges – could be significant.

Former SEC chairman Arthur Levitt believes “a tax on each stock transaction would probably drive high-frequency traders, and the liquidity they bring, to foreign markets.”<sup>136</sup> And not surprisingly, some foreign exchanges (*e.g.*, Mexico and Columbia) are actively courting high-frequency traders.<sup>137</sup> Those exchanges seek the liquidity supplied by high-frequency traders. Indeed, HFT is already surging around the world and is estimated to account for up to 40% of equity trading in Europe, 30% in Japan, 20% in Canada, and 10% in Brazil and Asia.<sup>138</sup>

Recent criticisms of HFT are reminiscent of the attacks on “program trading” that followed the October 1987 stock market crash. Program trading involves the use of a computer to enter buy or sell orders for 15 or more stocks as part of a coordinated trading strategy.<sup>139</sup> In 1987, program trading was widely associated with activities like stock index arbitrage (*i.e.*, trading to exploit price differences between stocks and stock index futures) and portfolio insurance (*i.e.*, dynamically re-balancing a portfolio to replicate the payoff of a protective put option) that were blamed by many for exaggerating or perhaps even causing the stock market crash.<sup>140</sup> Despite numerous such accusations, the weight of the empirical evidence demonstrated that program trading was *not* to blame for causing or exacerbating the crash, and, in some cases, seemed to ameliorate it.<sup>141</sup>

#### E. Overshooting and FTTs

Yet a third meaning sometimes ascribed to the term “volatility” is the supposed overshooting of market prices *vis-à-vis* the level dictated by economic fundamentals.

In 1976, Rudiger Dornbusch of the Massachusetts Institute of Technology published a model that predicted the initial overshooting of exchange rates due to the faster adjustment of asset

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<sup>135</sup> Reuters, “High-Frequency Trading Surges Across the Globe,” *New York Times* (December 2, 2009).

<sup>136</sup> Arthur Levitt, Jr., “Don’t Set Speed Limits on Trading,” *Wall Street Journal* (August 18, 2009).

<sup>137</sup> Reuters, “High-Frequency Trading...,” *op. cit.*

<sup>138</sup> Reuters, “High-Frequency Trading...,” *op. cit.*

<sup>139</sup> New York Stock Exchange Rule 80A.40(b).

<sup>140</sup> See, *e.g.*, *Report of the Presidential Task Force on Market Mechanisms* (Washington, DC: Government Printing Office, 1988) (a.k.a. “the Brady Report”), and Securities and Exchange Commission, Division of Market Regulation, *The October 1987 Market Break* (Washington, DC: Government Printing Office, 1988).

<sup>141</sup> See, *e.g.*, M. Miller *et al.*, *Findings of the Committee of Inquiry Examining the Events Surrounding October 19, 1987: Preliminary Report* (Chicago, Ill.: Chicago Mercantile Exchange, 1987); Commodity Futures Trading Commission, *Final Report on Stock Index Futures and Cash Market Activity During October 1987* (Washington, DC: Government Printing Office, 1988); D. Furbush, “Program Trading and Price Movement: Evidence from the October 1987 Market Crash,” *Financial Management* Vol. 18, No. 3 (1989), and the relevant references cited in C. L. Culp, “Stock Index Futures and Financial Market Reform,” *George Mason University Law Review* Vol. 13, No. 3 (1991).

markets relative to goods markets.<sup>142</sup> Twenty-five years later, Kenneth Rogoff of the International Monetary Fund described Dornbusch's paper as "one of the most influential papers written in the field of International Economics since World War II" and "marks the birth of modern international macroeconomics."<sup>143</sup> The Dornbusch "overshooting model" continues to be the foundation of much economic research.<sup>144</sup>

For example, Frankel (1986) applied the Dornbusch model to agricultural commodity prices.<sup>145</sup> A number of studies have further documented the overshooting of agricultural prices.<sup>146</sup> Zeira (1999) offered an "informational overshooting" explanation of stock market booms and crashes. One of the examples considered is the entry of new investors to the stock market. He argued that "stock prices rise as long as new investors enter, but when this group is exhausted, prices crash down."<sup>147</sup>

The idea that trading can lead to overshooting is further developed, for example, in a series of recent working papers by Stephan Schulmeister of the Austrian Institute of Economic Research.<sup>148</sup> Schulmeister argued that "financial markets are characterized by excessive liquidity and by excessive long-run volatility of prices (*i.e.*, strong and persistent deviations from their fundamental equilibria)."<sup>149</sup> He argued that the "pattern of asset price dynamics as a sequence of very short-term runs which accumulate to 'bull markets' or 'bear markets' and, hence, to long swings around the fundamental equilibrium suggests that the cumulative effects

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<sup>142</sup> R. Dornbusch, "Expectations and Exchange Rate Dynamics," *Journal of Political Economy* Vol. 84, No. 6 (1976).

<sup>143</sup> K. Rogoff, "Dornbusch's Overshooting Model After Twenty-Five Years," *IMF Working Paper WP/02/39* (February 2002), p. 3.

<sup>144</sup> See, e.g., J. Pippenger, "Freely Floating Exchange Rates Do Not Systematically Overshoot," *University of California Santa Barbara Working Paper* (February 11, 2008), and H. Bjornland, "Monetary Policy and Exchange Rate Overshooting: Dornbusch Was Right After All," *Journal of International Economics* Vol. 79, No. 1 (2009).

<sup>145</sup> J. Frankel, "Expectations and Commodity Price Dynamics: The Overshooting Model," *American Journal of Agricultural Economics* Vol. 68, No. 2 (1986).

<sup>146</sup> See, e.g., H. Burnquist and S. Kyle, "Overshooting Agricultural Prices and the Importance of Economic Structure: Evidence from Brazil," *Revista Brasileira de Economia* Vol. 49, No. 1 (1995); S. Saghaian, M. Hasan, and M. Reed, "Overshooting of Agricultural Prices in Four Asian Economies," *Journal of Agricultural and Applied Economics* Vol. 34, No. 1 (2002); S. Saghaian, M. Reed, and M. Marchant, "Monetary Impacts and Overshooting of Agricultural Prices in an Open Economy," *American Journal of Agricultural Economics* Vol. 84, No. 1 (2002); and C. Lai, S. Hu, and C. Fan, "The Overshooting Hypothesis of Agricultural Prices: The Role of Asset Substitutability," *Journal of Agricultural and Resource Economics* Vol. 30, No. 1 (2005).

<sup>147</sup> J. Zeira, "Informational Overshooting, Booms, and Crashes," *Journal of Monetary Economics* Vol. 43, No. 1 (1999), p. 238.

<sup>148</sup> See S. Schulmeister, "A General Financial Transaction Tax: A Short Cut of the Pros, the Cons and a Proposal," *Austrian Institute of Economic Research WIFO Working Paper No. 344* (October 2009); S. Schulmeister, "Trading Practices and Price Dynamics in Commodity Markets and the Stabilising Effects of a Transaction Tax," *Austrian Institute of Economic Research WIFO Working Paper* (January 2009); and S. Schulmeister, M. Schratzenstaller, and O. Picek, "A General Financial Transaction Tax: Motives, Revenues, Feasibility and Effects," *Austrian Institute of Economic Research WIFO Working Paper* (March 2008).

<sup>149</sup> Schulmeister, "Trading Practices ...," *op. cit.*, p. 71.

of increasing short-term transactions are rather destabilizing than stabilizing” and asserts that “[t]he growing importance of technical trading systems in financial markets contributes significantly to this pattern of price dynamics.”<sup>150</sup> He advocates imposition of a FTT to dampen technical trading.

The question of whether speculators are disrupting commodity markets and are responsible for the large price swings many commodities have experienced in the last few years (and thus whether a FTT might dampen such swings) has been the subject of considerable dispute. On the one hand, for example, the U.S. Senate’s Permanent Subcommittee on Investigations issued reports that concluded speculators are at least partially responsible for the recent unusual price behavior of some commodities (including wheat, natural gas, and crude oil).<sup>151</sup> On the other hand, numerous recent economic studies have concluded that speculative trading is not responsible for commodity price swings. Some of these studies stress that many non-exchange traded commodities that are not affected by financial speculation have experienced price swings that are as large as some exchange-traded commodities:

- Korniotis (2009) analyzed the co-movements of prices of six metals that are traded on futures markets with eight metals that are not over the period 1991-2008. Korniotis found that “the co-movements between metals with and without futures contracts has not weakened in recent years as speculative activity has risen” and this co-movement “is driven by economic fundamentals because world GDP [gross domestic product] growth is strongly correlated with metal price growth, especially after 2002” and “[t]he structural change in 2002 is also consistent with supply and demand information found in industry newsletters.”<sup>152</sup>

In other cases, economic studies have found evidence inconsistent with the hypothesis that speculation is driving price changes, such as evidence that speculative activity tends to lag, not lead, price changes:

- Korniotis (2009) used the S&P Goldman-Sachs Commodity Index returns as a proxy for the volume of speculative activity and found that over the period 1991-2008, “these returns are unrelated to [spot] metal prices.”<sup>153</sup>
- Brunetti and Büyükşahin (2009) used the CFTC Large Trader Reporting System (“LTRS”) to identify positions of each trader category from January 2005 through March 2009. They

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<sup>150</sup> *Id.*, p. 72.

<sup>151</sup> See, Senate Permanent Subcommittee on Investigations, *Excessive Speculation in the Wheat Market* (June 24, 2009), Senate Permanent Subcommittee on Investigations, *Excessive Speculation in the Natural Gas Market* (June 25, 2007), and Senate Permanent Subcommittee on Investigations, *The Role of Market Speculation in Rising Oil and Gas Prices: A Need to Put the Cop Back on the Beat* (June 27, 2006).

<sup>152</sup> G. Korniotis, “Does Speculation Affect Spot Price Levels? The Case of Metals with and without Futures Markets,” *Working Paper No. 2009-29, Finance and Economics Discussion Series, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board* (May 26, 2009), abstract.

<sup>153</sup> *Id.*

found that “speculative activity does not affect prices” and, in fact, “by taking the reverse positions of other market participants, hedge funds provide liquidity to the market.”<sup>154</sup>

- Büyükşahin and Harris (2009) used the CFTC LTRS to analyze crude oil prices over the period from July 5, 2000, through March 18, 2009. Their tests yield “little evidence that hedge funds and other non-commercial (speculator) position changes Granger-cause price changes; – the results instead suggest that price changes do precede their position changes.”<sup>155</sup>
- Einloth (2009) did not find a systematic relationship between speculative activity and crude oil prices, but concluded that speculation may have contributed to part of the increase in oil prices in 2008. Einloth found “a buildup of speculative inventory accompanied the spike in prices from \$100 to \$140 per barrel in the summer of 2008” that suggests “speculation did play a role in its subsequent rise to \$140.”<sup>156</sup>
- The Interagency Task Force on Commodity Markets (2008) analyzed the crude oil market between 2003 and mid-2008 and concluded that “changes in positions of swap dealers and non-commercial traders most often followed price changes,” which “does not support the hypothesis that the activity of these groups is driving prices higher.”<sup>157</sup> The Task Force “has found that the activity of market participants often described as ‘speculators’ has not resulted in systematic changes in price over the last five and a half years”, and, on the contrary, “most speculative traders typically alter their positions following price changes, suggesting that they are responding to new information – just as one would expect in an efficiently operating market.”<sup>158</sup>

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<sup>154</sup> C. Brunetti and B. Büyükşahin, “Is Speculation Destabilizing?” *Commodity Futures Trading Commission Working Paper* (April 22, 2009), p. 4.

<sup>155</sup> B. Büyükşahin and J. Harris, “The Role of Speculators in the Crude Oil Futures Market,” *Commodity Futures Trading Commission Working Paper* (2009), abstract.

<sup>156</sup> J. Einloth, “Speculation and Recent Volatility in the Price of Oil,” *Federal Deposit Insurance Corporation Center for Financial Research Working Paper No. 2009-08* (October 2009), pp. 1, 4.

<sup>157</sup> Interagency Task Force on Commodity Markets, *Interim Report on Crude Oil* (July 2008), p. 5. The Interagency Task Force is chaired by CFTC staff and composed of staff members from the Departments of Agriculture, Energy and the Treasury, the Board of Governors of the Federal Reserve, the Federal Trade Commission, and the Securities and Exchange Commission.

<sup>158</sup> *Id.*

## VI. OTHER POTENTIAL BENEFITS AND COSTS OF FTTs

### A. Impact on Managerial Myopia

Advocates of recently proposed FTTs have emphasized that transaction taxes will decrease trading with very short time horizons and claim this will enable managers to focus more on long-term decision making instead of short-term issues affecting stock prices.<sup>159</sup> FTT advocates also argue that managers' focus on short-run moves in stock prices instead of the long-run economic interests of their firms has been exacerbated by the rise in algorithmic and HFT over the past decade.

U.K. Treasury Minister Lord Myners, for example, warned in November 2009: "The danger is that companies become the playthings of speculators."<sup>160</sup> More specifically, Lord Myners stated: "I have been increasingly troubled that we seem to find ourselves in a situation in which shares are to be bought and sold rather than being part of an ownership relationship between investor and a company."<sup>161</sup>

In order for these concerns to be a valid criticism of short-term trading, one must embrace the notion that managers of corporations sacrifice longer-term investment opportunities in order to manage short-term earnings and stock price changes. As Schwert and Seguin observed, this justification of FTTs requires "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."<sup>162</sup>

Even some of the supporters of FTTs have been skeptical of the use of FTTs to address the so-called "managerial myopia problem." Joseph Stiglitz of Princeton University and winner of the 2001 Nobel Memorial Prize in Economic Sciences, for example, observed:

The fundamental question can be put simply: does one really believe that the managers of GM or Ford base their decisions about whether or how to invest on the prices that they see on the stock market? Do they think that those prices—reflecting judgments of the dentists in Peoria and the retired insurance salesmen in Florida—have much, if anything, to add to the analysis of their own market research departments and the reports from their engineers concerning costs of various projects? Any manager who argued that *because* the price of his stock was high it was therefore a good idea to invest more would, I suspect, quickly find himself looking for another job.<sup>163</sup>

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<sup>159</sup> Aspen Institute, *op. cit.*

<sup>160</sup> "Myners' Super-Fast Shares Warning," *BBC News* (November 3, 2009).

<sup>161</sup> *Id.*

<sup>162</sup> Schwert and Seguin, *op. cit.*, p. 29.

<sup>163</sup> J. Stiglitz, "Using Tax Policy to Curb Speculative Short-Term Trading," *Journal of Financial Services Research* Vol. 3, Nos. 2-3 (1989), p. 107.

The economic literature does not generally support the hypotheses that (i) investors' short-term focus leads to myopic behavior by managers, or (ii) that myopic behavior by managers is attributable to pressure from short-term investors instead of other factors:

- Samuel (2000) analyzed the relationship between shareholder horizons and managerial horizons for a sample of manufacturing firms over the period from 1972 to 1990 and concluded: "The evidence presented in this paper suggests that shareholder myopia may not necessarily lead to managerial myopia. To the extent that managerial myopia is a problem for some firms, the reasons for this must be sought elsewhere. These results also cast doubts on the 'capital market pressure hypothesis,' wherein shareholder trading horizons are expected to influence managerial investment horizons with unfavorable consequences for the firm's investment decisions for the long-term, especially with regard to intangible investments."<sup>164</sup>
- Wahal and McConnell (2000) studied the corporate capital expenditures for property, plant, and equipment and research and development for more than 2,500 U.S. firms over the period from 1988 to 1994 and found "no support for the contention that institutional investors cause corporate managers to behave myopically."<sup>165</sup>
- Nyman (2005) constructed a model which suggests that managerial myopia may be at least partially self-correcting because as management becomes more focused on the short-term, the expected profit from informed trading increases, thereby giving investors an increased incentive to expend resources to become informed.<sup>166</sup>

Concerns that excessive trading encourages myopic managerial decision making are especially hard to accept when directed at HFT. Lord Myners noted: "I think the fact that people can own shares for nano-seconds seems completely divorced from the concept of a joint stock company and distributed share ownership."<sup>167</sup> And yet, virtually no company in the world makes real investment decisions at the frequency of a nano-second. To the extent that HFT has a price impact on company stocks, it is transitory. So it would be pure accident for any specific high-frequency trade to influence a specific investment decision.

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<sup>164</sup> C. Samuel, "Does Shareholder Myopia Lead to Managerial Myopia? A First Look," *Applied Financial Economics* Vol. 10, No. 5 (2000), p. 503.

<sup>165</sup> S. Wahal and J. McConnell, "Do Institutional Investors Exacerbate Managerial Myopia?" *Journal of Corporate Finance* Vol. 6, No. 3 (2000), p. 307.

<sup>166</sup> I. Nyman, "Stock Market Speculation and Managerial Myopia," *Review of Financial Economics* Vol. 14, No. 1 (2005).

<sup>167</sup> "Myners' Super-Fast Shares Warning," *op. cit.*

## B. Impact on Market Liquidity and Depth

The imposition of a FTT has important implications for market liquidity. As discussed in Section III.A, liquidity and market depth are especially important for the success of organized securities and exchange-traded derivatives markets. Without adequate depth and liquidity, even relatively small bids and offers can move market prices. Large bids and offers, in turn, may get executed at multiple prices, and, if the market is particularly illiquid, the last execution price on the large order may be far worse than the first one. In addition, FTTs could decrease market liquidity by reducing transaction volume.

Liquidity is also important from a risk management perspective. Without adequate liquidity, market participants find it more difficult to hedge or liquidate losing positions, especially during periods of market volatility and stress (as the last half of 2007 and 2008 painfully reminded us).

## C. Impact on Retail Investors

Despite the claims of Rep. DeFazio and other FTT supporters, the economic literature suggests that the average investor and pension funds will face significant costs as a result of FTTs.<sup>168</sup> As McConnell (1993) noted in his analysis of FTTs, their impact “depends on the design of the tax and on the nature of the investor”, but, “[i]n the final analysis, of course, all taxes are paid by individuals.”<sup>169</sup>

For example, even though investors will not be taxed directly when they buy or sell mutual fund shares, the mutual funds that invest customer funds will still themselves have to pay the FTT. And their own costs will almost certainly be passed along to investors. Even so-called “passive” or “buy-and-hold” investors like index funds have significant portfolio turnover as new funds are invested and withdrawn and as portfolios are adjusted to track changes in their benchmark index due to, for example, mergers, acquisitions, or de-listings. Index fund investors will pay the FTT indirectly via a lower return on their mutual fund shares. Actively managed mutual funds have much higher portfolio turnover rates than index funds and would thus generate higher transaction taxes.

In addition, as discussed above, available evidence indicates that FTTs reduce market liquidity and widen bid-ask spreads. As a result, investors pay higher transaction costs in addition to the higher fees that are directly attributable to a FTT. According to the chief investment officer of the Vanguard Group, the cost of trading from bid-ask spreads and market impact is now about 25 bps for large company stocks and 50 bps for small company stocks.<sup>170</sup> Imposing a 25 bp FTT

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<sup>168</sup> The U.S. already has a FTT – an SEC fee of 0.0033% – but this is negligible compared with the proposed new 0.25% tax rate.

<sup>169</sup> J. McConnell, “Securities Transactions Taxes: What Would Be Their Effects on Investors and Portfolios?” in *Securities Transaction Taxes: False Hopes and Unintended Consequences*, S. Hammond, ed. (Catalyst Institute, 1995), p. 144.

<sup>170</sup> “The Impact of High-Frequency Trading: Manipulation, Distortion or a Better-Functioning Market?” (September 30, 2009). (<http://knowledge.wharton.upenn.edu/article.cfm?articleid=2345>)

thus would increase trading costs by 50 bps for small company stocks and 100% for large company stocks.

#### D. Impact on Non-Financial Corporations

Taxing financial transactions is often regarded as a tax that is only borne by traders and financial market participants. In fact, FTTs may also deleteriously impact non-financial corporations, including those which undertake only limited trading activities.

The equity cost of capital for a corporation is the expected return that investors require to hold the company's stock. That expected return is, of course, inclusive of *investors'* transaction costs. FTTs that raise the cost of transacting for investors will thus increase the cost of capital for non-financial corporations (and financial companies, as well) that finance themselves using equity markets.

Economic studies find that FTTs raise the cost of capital, which "implies that some investments that are now desirable (*i.e.*, their internal yield is sufficient to cover the cost of capital) will no longer be undertaken" and the result "will be a reduction in the rate of capital formation in the U.S. and an overall decline in the competitiveness of the U.S. economy and its capital markets"<sup>171</sup>:

- In a study prepared for the Association of British Insurers, City of London Corporation, Investment Management Association, and the London Stock Exchange, Oxera (2007) estimated that "stamp duty abolition would be likely to result in a reduction in the nominal post-tax cost of capital ... equivalent to a reduction in the cost of capital by 0.50-0.60 percentage points."<sup>172</sup>
- Hawkins and McCrae (2002) estimated the impact of the U.K. stamp duty on the cost of capital and, depending on the specific assumptions, found that it raised the cost of capital between 15 and 72 basis points.<sup>173</sup> They also found that the cost of capital would fall if the stamp duty was abolished and the lost revenue was recouped through an increase in the corporate tax rate.

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<sup>171</sup> Y. Amihud and H. Mendelson, "Transaction Taxes and Stock Values," in *Modernizing U.S. Securities Regulation: Economic and Legal Perspectives*, K. Lehn and R. Kamphuis, eds. (Homewood, Ill.: Irwin Professional Publishing, 1993), pp. 492-93.

<sup>172</sup> Oxera, *Stamp Duty: Its Impact and the Benefits of Its Abolition*, Study Prepared for the Association of British Insurers, City of London Corporation, Investment Management Association, and the London Stock Exchange (May 2007), p. 16.

<sup>173</sup> M. Hawkins and J. McCrae, "Stamp Duty on Share Transactions: Is There a Case for Change?" *Institute for Fiscal Studies Working Paper* (June 2002).

- Hakkio (1994) estimated that given the prevailing price-earnings ratio and corporate tax rates at the time (*i.e.*, 1994), imposition of a FTT which reduced security prices by 5% would increase the cost of capital by about 70 basis points (0.70%).<sup>174</sup>
- Schwert and Seguin (1993) noted that “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.”<sup>175</sup>

For similar reasons, a FTT would be expected to increase the cost to the government of selling U.S. securities. More specifically, a FTT on debt derivatives such as Treasury futures and options lowers the attractiveness of the cash market in Treasuries by raising the cost to market participants of hedging risks. The increased risk to cash market participants resulting from less liquid derivatives markets would require that the Treasury pay a higher interest rate to investors. Based on the size of marketable Treasury debt outstanding of about \$7 trillion, even a one basis point drop in borrowing cost (0.01%) would translate to \$700 million in savings to U.S. taxpayers.

Transaction taxes on derivatives contracts, moreover, will raise the costs of hedging for non-financial corporations, thereby making it more expensive for them to engage in prudential risk management. Such corporate hedgers are likely to turn to untaxed derivatives transactions (*e.g.*, customized over-the-counter derivatives) or to offshore jurisdictions.

## VII. CONCLUSION

Economic research on the impact of FTTs provides a valuable lens through which to evaluate the likely impact of recent calls for implementing new FTTs as a response to the credit crisis. A review of the fairly extensive economic literature on the impact of past FTTs indicates that the claims made by proponents of FTTs are generally not supported by available economic theory and evidence. On the contrary, the empirical record indicates that FTTs are likely to have an adverse effect on asset prices and divert trading to unaffected jurisdictions and products. At the same time, the available evidence indicates that FTTs will not reduce the supposed “excess” variability in asset prices. In sum, FTTs are likely to adversely affect the ability of financial markets to allocate resources to their most highly valued uses.

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<sup>174</sup> C. Hakkio, “Should We Throw Sand in the Gears of Financial Markets?” *Federal Reserve Bank of Kansas City Economic Review* Vol. 79, No. 2 (1994).

<sup>175</sup> Schwert and Seguin, *op. cit.*, p. 31.