

# A Proposal to Tax Financial Transactions

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## Abstract

We propose a tax instrument that is not currently used to any significant degree by the United States: a financial transaction tax (FTT). An FTT—if carefully designed and implemented—would raise substantial revenues in a progressive manner. We propose an FTT of 10 basis points that would apply to trading in stocks, bonds, and derivatives. We do not believe an FTT at this level would hinder market functioning or impede price discovery, and in fact it would be less than the recent declines in transaction costs that have occurred in many markets. The Urban-Brookings Tax Policy Center estimates that the proposal would raise approximately \$60 billion in annual revenue once it is fully phased in. Because the United States does not have recent experience with a nontrivial FTT, some aspects of its effects—including the precise amount of revenue that would be raised—remain uncertain. For this reason, we propose a staged implementation over four years, with the FTT starting at 2 basis points, to allow policymakers to monitor market functioning, address avoidance techniques that will undoubtedly arise, and, if necessary, more carefully calibrate the level of the tax.

## Introduction

No single tax instrument, by itself, can efficiently and fairly raise the funds needed to provide public services at different points throughout the business cycle. Our tax system reflects this reality, relying on a mixture of taxes that have different behavioral impacts, economic incidences, and effects on economic output. Relying on a diversity of taxes is more likely to minimize the efficiency costs of raising a given amount of revenue, while broadly distributing the burden of taxation among those with the means to pay. In addition, addressing the current gap between government revenues

and outlays needed for vital programs will likely require a number of incremental tax measures.

In this spirit, we propose a tax instrument that is not currently used to any significant degree by the United States: a financial transaction tax (FTT). An FTT—if carefully designed and implemented—would raise substantial revenue in a progressive manner. We do not believe an FTT at the level we propose would hinder market functioning or impede price discovery. In addition, some of the financial activity it would discourage, including some high-frequency trading and algorithmic trading, may provide limited marginal economic benefit to the country as a whole.

Like all taxes, an FTT would have associated efficiency costs. The potential amount of revenue raised and the magnitude of an FTT's associated deadweight losses depend crucially on the size of the tax, the responsiveness of market participants to the new tax, and the economic value of any lost activity, which we address below. While critics often suggest that an FTT would have dramatic adverse effects on asset prices, the cost of capital, and financial market functioning, these arguments appear overstated when placed in the context of total transaction costs and prior changes in the tax code. The FTT we propose would be smaller than the decline in transaction costs that has occurred in recent years in many markets. Opponents of an FTT argue that even small increases in transaction costs will significantly increase the cost of capital, but there is a lack of convincing empirical evidence that the recent reduction in transaction costs has had the opposite effect. Moreover, U.S. financial markets have functioned well through a variety of changes to relevant tax policies,<sup>1</sup> and it is unclear whether a small FTT would be any more significant.

While we believe the merits of an FTT are compelling, we do not want to overstate what it would accomplish. For example, there is no strong evidence that an FTT would reduce financial market risks or the probability of future asset price bubbles. An FTT is also unlikely to significantly increase investors' long-term focus. While it would reduce some high-velocity, short-term trading strategies, we do not expect a small fee to be sufficient to motivate end investors to adopt a longer-run perspective. Additionally, although an FTT would be progressive, the tax burden would not exclusively fall on the financial sector or the wealthiest households. A small portion of the FTT would fall on those in the middle of the income distribution, either through trades they make directly or through funds in which they invest. Lastly, some advocates suggest that an FTT could raise exorbitant amounts of tax revenue that are unlikely to be achieved. Rather, we suggest that an FTT could prove a useful component of a more comprehensive tax program.

The FTT we propose would be phased in over four years, starting at 2 basis points (0.02 percent) and increasing annually until it reaches a target rate of 10 basis points, and it would apply to trading in stocks, bonds, and derivatives.<sup>2</sup> According to revenue and distributional estimates of our proposed FTT by the Urban-Brookings Tax Policy Center (TPC), it would raise annual revenue of approximately \$60 billion once fully phased in, with cumulative estimated revenue in excess of \$500 billion between 2020 and 2030. The tax would also be progressive. Nearly 70 percent of the tax burden would fall on those in the top income quintile, with 23 percent on those in the top 1 percent and approximately 85 percent on those in the top 40 percent of the income distribution. The proposal is even more progressive when calculating the tax burden across the wealth distribution, where financial asset holdings are more concentrated.

In this chapter, we discuss the many design and implementation parameters that are central to making an FTT a useful tax instrument. Our choices attempt to balance the objectives of raising revenue while preventing punitive effects on financial markets and long-term savings vehicles. We also define the FTT base to minimize the potential for shifting investments offshore or to untaxed instruments. We propose a gradual phase-in of the FTT to allow policymakers to monitor market functioning, address avoidance techniques that will undoubtedly arise, and more carefully calibrate the level of the tax—higher or lower—based on the data that are gathered. Because the United States does not have recent experience with a nontrivial FTT, some questions about its effects—including the degree of responsiveness of market participants and the precise amount of revenue that would be raised—remain unanswered. Careful monitoring and data analysis during the implementation period can help to address these knowledge gaps and inform future adjustments of the FTT to achieve desired policy outcomes.

## Background

Financial transaction taxes have a long history, both in theory and in practice. The theoretical basis for an FTT dates back at least to Keynes (1936), who conceived of an FTT as a way to discourage short-term speculation in stock markets. The idea was then reintroduced by Tobin (1978), Stiglitz (1989), and Summers and Summers (1989).

Though the United States does not currently have a significant FTT, the Securities and Exchange Commission (SEC) collects a fee on equities, securities futures, and options that is used to fund the agency (the SEC Fee). As shown in table 1, the SEC Fee, currently 0.203 basis points on equities,

is small and does not raise much revenue. The United States had a more significant FTT in the past. Beginning in 1914, the United States taxed all stock sales at a rate of 2 basis points of the par value and doubled that rate in 1932 to raise revenue in the midst of the Great Depression (Burman et al. 2016). However, the tax was phased out in 1965 as part of a broader package repealing a number of Depression-era excise taxes (Keightley 2010). Similarly, New York State and New York City imposed a tax on stock transfers from 1905 to 1981 (Pollin, Baker, and Schaberg 2003).

## **EXISTING FTTS**

A number of contemporary FTTS are used abroad. Table 1 summarizes five illustrative existing FTTS: the small SEC Fee and those in France, Italy, the United Kingdom, and Hong Kong. The Hong Kong FTT is notable as a relatively effective example in terms of both market context and the amount of revenue raised. The tax is currently 20 basis points (10 basis points levied on both the buyer and seller), after being reduced several times between 1991 and 2001, and is applied to stock transactions. Unlike many other international FTTS, the Hong Kong tax has been quite successful at generating revenue, raising annual proceeds equivalent to approximately 1.2 percent of gross domestic product (GDP). The tax also has not prevented Hong Kong from serving as a major financial center.<sup>3</sup>

## **MAGNITUDE OF PROPOSED FTT RELATIVE TO HISTORICAL TRANSACTION COSTS**

One way to evaluate the potential effects of an FTT is to put it in the context of other transaction costs. An FTT that represents a dramatic increase in transaction costs is likely to have a larger effect on market activities and generate higher economic costs than one that results in only a modest increase. We describe the state of transaction costs for buying and selling equities and fixed income securities and discuss how they have evolved over several decades.

In equities, trading costs such as the SEC Fee, exchange fees, and broker commissions result in aggregate direct costs of approximately 3 to 5 basis points on average for institutional transactions and 1 to 10 basis points for retail transactions.<sup>4</sup> There are also indirect transaction costs because investors may need to pay more than the market price for on-demand liquidity (the ability to buy and sell immediately). One such measure of this cost is the bid-ask spread, which is often as little as \$0.01 per share for the most liquid stocks but can be significantly higher for smaller-cap companies. Larger institutional orders may incur more significant indirect costs because they move the stock price, with the difference between the

TABLE 1.

## Summary of Selected Existing FTTs

	SEC Fee	France FTT	Italy FTT	UK Stamp Tax	Hong Kong Stamp Tax
Revenue raised	0.01% of GDP (\$1.7 billion to cover SEC budget)	0.03% of GDP	0.04% of GDP	0.2% of GDP	1.2% of GDP
Stocks	Currently 0.203 basis points on the value of a covered sale; set annually to recoup SEC budgetary cost	30 basis points on the net intraday purchase of equity of French companies with greater than €1 billion market cap	10 basis points for on-exchange and 20 bps for over-the-counter (OTC) intraday purchases of equity of Italian companies with greater than €500 million market cap	50 basis points on purchases on securities issued by UK-incorporated companies or registered in the United Kingdom	20 basis points total (10 basis points each on the buyer and the seller)
Bonds	Excluded	Excluded	Excluded	Excluded	Qualified bond arrangements exempt
Derivatives	\$0.0042 per transaction on securities futures and options	Excluded	Fixed fee (based on type of contract and notional value) applied to equity derivatives with underlying Italian shares	Excluded other than exercise of options	Excluded
New equity and debt issuance	Exempt	Exempt	Exempt	Exempt	Exempt
Market makers	No exemption	Acquisitions in the course of market making are exempt	Market makers and liquidity providers, as defined by EU regulations, are exempt	Purchases by recognized brokers and other securities dealers are exempt	Applicable market-making transactions of a securities market maker is subject to stamp duty refund

	SEC Fee	France FTT	Italy FTT	UK Stamp Tax	Hong Kong Stamp Tax
Collection	Collected by national securities exchange and by national securities associations (or through their members)	Collected via executing broker if present, or via custodian if not	Generally collected via the financial intermediary closest to the client or directly from the purchaser if no financial intermediary is present	Reporting and payment through the Central Securities Depository (CREST); for transactions outside CREST, tax calculated, reported and paid directly	Stamp duty payable to the exchange for exchange transaction
Scope	Sale of a security occurring on a national securities exchange or by or through any member of a national securities association	Purchases of securities of French issuers with greater than €1 billion market cap (regardless of where trade occurs)	Purchases of securities of Italian issuers with greater than €500 million market cap (regardless of where trade occurs)	Purchases of shares in UK companies (regardless of where trade occurs)	Payable on equity trades whenever there is a change in beneficial ownership, irrespective of where the transfer was settled



initial price and the average execution price known as the implementation shortfall. Estimates of the average implementation shortfall for institutional orders in recent years range from approximately 10 basis points (Frazzini, Israel, and Moskowitz 2018) to 30 basis points (Virtu Financial 2019). In total, the average transaction-related costs are estimated to be between 15 and 35 basis points for larger institutional orders and 2 to 15 basis points for retail orders.<sup>5</sup>

Current equity transaction costs are low by historical standards. Quoted bid-ask spreads were significantly higher during the 1980s and 1990s, averaging between 20 and 60 basis points (Jones 2002). Commissions were also much higher, with average levels near 90 basis points prior to their deregulation in 1971. By one measure, combined transaction costs were more than 100 basis points in the early 1980s (French 2008). Since then, both direct and indirect transaction costs have declined significantly, driven by commission deregulation, stock price decimalization in 2001, and technological and market structure changes. The proposed FTT of 10 basis

points per transaction is less than half of Virtu Financial’s (2019) estimate of the decline in average institutional trading costs over the past decade.<sup>6</sup>

In fixed income markets, transaction costs vary significantly by type of security. Corporate bonds and municipal securities generally face higher costs: estimated corporate bond transaction costs are approximately 80 basis points for retail-sized trades and 5 to 50 basis points for larger institutional trades (Edwards, Harris, and Piwowar 2004; Harris 2015; Mizrach 2015), while estimated municipal security transaction costs are roughly 80 basis points for retail-sized trades and 20 to 70 basis points for larger trades (Wu 2018). Benchmark U.S. Treasury securities, on the other hand, have much lower transaction costs. Adrian, Fleming, and Vogt (2017) found narrow bid-ask spreads on institutional trading platforms: 0.8 basis points for the 2-year note, 1.0 basis points for the 5-year note, and 2.0 basis points for the 10-year note. They also found average price impacts, an alternative measure of liquidity, of 10.8 basis points per 100 net trades for the 2-year note, 24.2 for the 5-year note, and 41.8 for the 10-year note. Historical transaction cost data are more limited for fixed income markets, but they also appear to show some decline in costs over recent decades.<sup>7</sup>

## The Challenge: Assessing the FTT Based on Tax Principles

The core challenge for tax policy is to raise a given amount of revenue in an equitable, efficient, and administratively simple manner. In this section, we apply these considerations to an FTT and discuss implications for its design.

### EQUITY

Any tax is ultimately paid by individuals, whether in their capacities as consumers, workers, or owners of capital. Fairness requires that the resulting tax burden be *equitable*, which is generally understood in terms of how it is distributed across individuals. A tax is vertically equitable if those with greater financial resources pay a larger fraction of their resources. This concept is usually discussed in terms of whether (and to what extent) a tax is progressive. The progressivity of an FTT is determined by its economic incidence, or who actually bears the burden of the tax.

The initial impact of introducing an FTT would be highly progressive. Using financial asset ownership as a proxy for financial transactions, the direct effects of introducing an FTT would disproportionately fall on those with high levels of wealth. Although some assets—particularly 401(k) and

pension plans—are held by those with moderate wealth, figure 1 shows that the top 10 percent of the wealth distribution accounts for 86 percent of household holdings of corporate equities and mutual fund shares, 81 percent of corporate and foreign bonds, and 79 percent of U.S. government and municipal securities holdings. The bottom 50 percent of the wealth distribution holds very little of the financial wealth of the United States (see figures 1 and 2). Foreign investors are also significant holders of U.S. financial securities and would be a meaningful source of FTT revenue.<sup>8</sup>

For families in the middle of the distribution, their most significant financial assets are often held indirectly, through retirement funds and pooled vehicles like mutual funds (Board of Governors of the Federal Reserve System [Federal Reserve] 2017). The average mutual fund has annual turnover of approximately 32 percent (Investment Company Institute 2019), which suggests that the FTT would result in a relatively modest increase in fund expenses (e.g., a 10 basis point FTT implies approximately 3 basis points of annual costs at the average turnover). Direct trading within retirement accounts also appears to be limited: Mitchell et al. (2006) found that 80 percent of 401(k) participants initiated no trades in a two-year period. Moreover, Ameriks, Wraniak, and Salovey (2009) document that among investors between ages 40 and 64 with an IRA or 401(k) account, those with lower financial wealth tended to trade less frequently, suggesting minimal direct FTT costs in these accounts.

Defined-benefit plans also represent a significant financial asset for some in the middle of the wealth distribution. The effect of the FTT on the future returns of plans would depend on the investment strategies employed. For example, investments in passive index funds<sup>9</sup> or illiquid strategies that have low levels of trading should have limited direct FTT costs. On the other hand, an FTT may reduce the returns on investments in funds that employ high turnover strategies, in which many plans invest to some extent.

As described later in this chapter, the distributional analysis of our proposal conducted by TPC projects that the tax incidence 10 years after implementation would be highly progressive.<sup>10</sup>

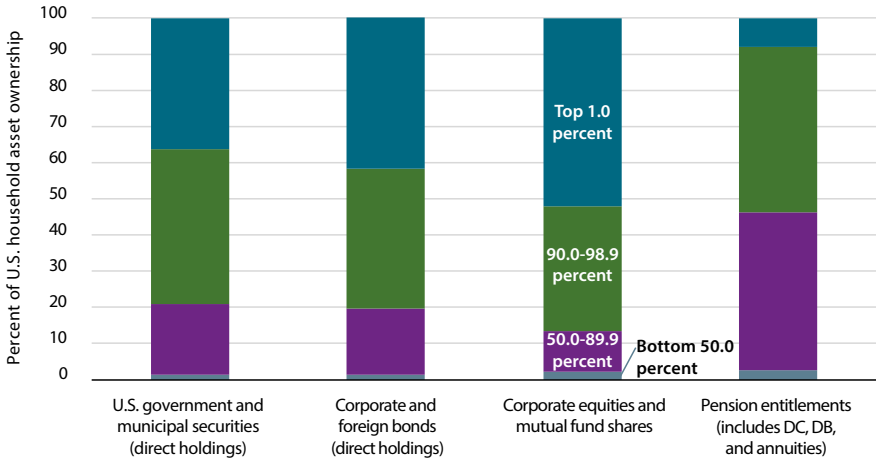
## **EFFICIENCY**

An FTT, like all taxes, will distort economic activity to some extent. Assessing the efficiency implications of these distortions is complex, however, because they depend crucially on how various financial market participants will respond and the optimal level of financial activity. In this subsection, we review key efficiency considerations associated with an FTT, along with the current state of research on these topics. We later discuss the



FIGURE 1.

## Ownership Share of Selected Assets by Household Wealth Group



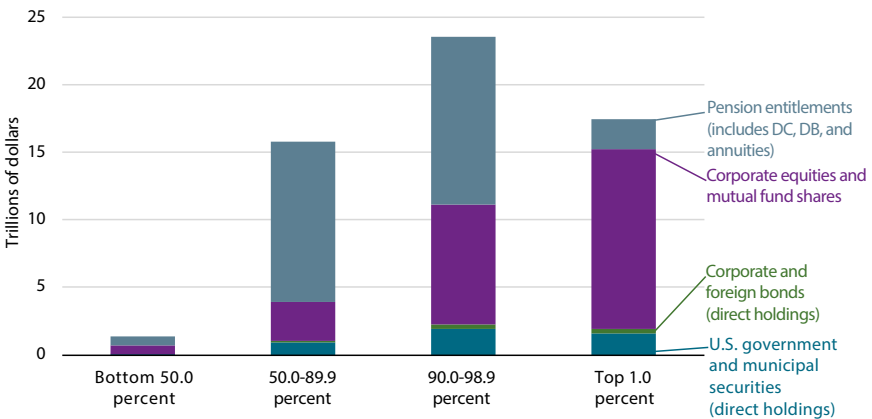
Source: Board of Governors of the Federal Reserve System (Federal Reserve) 2019a.

Note: U.S. government and municipal securities and corporate and foreign bonds include direct holdings only. Corporate equities and mutual fund shares comprise direct holdings and the portion of investment vehicles, such as IRAs, trusts, managed investment accounts, 529 plans, and Health Savings Accounts, that are invested in equities; the category excludes holdings through defined-contribution retirement plans, such as 401(k) and 403(b) plans. "DC" refers to defined-contribution retirement plans, and "DB" refers to defined-benefit retirement plans.



FIGURE 2.

## Total Value of Selected Assets by Household Wealth Group



Source: Board of Governors of the Federal Reserve System (Federal Reserve) 2019a.

Note: U.S. government and municipal securities and corporate and foreign bonds include direct holdings only. Corporate equities and mutual fund shares comprise direct holdings and the portion of investment vehicles, such as IRAs, trusts, managed investment accounts, 529 plans, and Health Savings Accounts, that are invested in equities; the category excludes holdings through defined-contribution retirement plans, such as 401(k) and 403(b) plans. "DC" refers to defined-contribution retirement plans, and "DB" refers to defined-benefit retirement plans.



potential impacts our proposed FTT would have on U.S. financial markets and the resulting implications for the associated efficiency costs.

### *Efficiency Considerations*

Because FTTs are a tax on the gross, rather than net, value of financial transactions, the same economic value can be taxed multiple times—once at each trade (see box 1 for an alternative way to tax financial activity).<sup>11</sup> Thus, the tax can cascade as more frequently traded assets are subject to the tax for each transaction, resulting in differences in effective tax rates across trading strategies, assets, and sectors. This differential tax treatment could lead to distortions in trading and portfolio decisions. For example, investors with passive trading strategies with infrequent trades would incur little tax compared with those who use more active strategies with higher turnover (incurring a tax on each occasion).<sup>12</sup> Companies and sectors more reliant on the issuance of publicly traded securities also would be more affected by the FTT, with potential implications for resource allocation and economic efficiency.

A large empirical literature demonstrates that, by increasing transaction costs, an FTT will reduce trading volumes. Estimates of the magnitude of the effect, however, vary widely.<sup>13</sup> Trading responses to historical changes in FTTs and other transaction costs range from a sharp decline in trading (i.e., an elasticity of  $-1.7$ ) to no response (Matheson 2012). More recent studies of the French FTT implemented in 2012 estimated trading volume declines of 15 to 30 percent (Capelle-Blancard and Havrylchuk 2016; Colliard and Hoffmann 2017; Haferkorn and Zimmermann 2013), while the estimated volume decline following Italy's FTT implementation in 2013 was more modest (Cappelletti, Guazzarotti, and Tommasino 2016). To the best of our knowledge, evidence on the effects of some other FTTs, such as Hong Kong's (which is generally considered to be among the more successful), is limited.

Opponents of an FTT argue that the reduced trading and higher transaction costs associated with the tax would harm liquidity and increase the cost of capital, with a resulting reduction in asset prices (Bond, Hawkins, and Klemm 2004; Habermeier and Kirilenko 2003; Schwert and Seguin 1993). They argue that, even if initial issuances are untaxed, an FTT could increase the cost of capital through investor expectations about future resale prices. From a theoretical perspective, Coelho (2016a) estimates that a 20 basis point FTT would increase the cost of capital by 0.8 percent, whereas Amihud and Mendelson (1992) suggest that a 50 basis point FTT would increase the cost of capital by 1.33 percent. Estimates based on empirical data have

## BOX 1.

## Financial Activity Taxes: An Alternative to an FTT

An alternative to the FTT is a financial activity tax (FAT) that would tax the net value, much as a value-added tax (VAT) does broadly for value added. Because an FTT taxes gross proceeds, the burden falls disproportionately on transaction-intensive businesses. A FAT, by contrast, taxes net proceeds and does not have this feature (Burman et al. 2016). However, a FAT may be infeasible given the difficulty of measuring financial value added. Indeed, the financial sector is almost always exempt from a VAT in countries that use it (Burman et al. 2016; Merrill 1997). The efficiency gains from reducing rent-seeking trading may also justify implementing an FTT even when a FAT is in place (Shaviro 2012). Moreover, if some variant of a FAT is infeasible, politically or otherwise, then a well-designed FTT is an attractive alternative for raising tax revenues in a progressive way.

also shown the potential for FTTs to reduce asset prices (Bond, Hawkins, and Klemm 2004; Hu 1998; Umlauf 1993),<sup>14</sup> with larger price reductions seen in more liquid securities (Amihud and Mendelson 1992). More recent estimates of asset price responses to changes in transaction costs have found smaller effects (Coelho 2016a; Deng, Liu, and Wei 2018).<sup>15</sup> The magnitude of any change to the cost of capital and its associated efficiency costs depends on a range of factors including the design of the tax and the underlying market ecosystem, for which our proposal may differ from past empirical analyses. As we discuss later in more detail, the efficiency implications of the proposal will crucially depend on the size of the tax, the types of trades that are discouraged by the increase in transaction costs, and the resulting incidence of the tax.

While some have argued that an FTT could produce efficiency gains by reducing volatility, the evidence on this point is inconclusive both theoretically and empirically. Song and Zhang (2005) suggest that the volatility effect depends on the composition of traders in the market, whereas Vayanos (1998) shows that FTTs may have ambiguous volatility effects even in a market with only fundamental-based traders.<sup>16</sup> Empirically, FTTs have been found to be associated with decreases (Hanke et al. 2010;

Liu and Zhu 2009), increases (Capelle-Blancard and Havrylchuk 2016; Colliard and Hoffmann 2017; Jones and Seguin 1997; Umlauf 1993), and no change (Hu 1998) in volatility.

An efficiency argument can be made in favor of an FTT if some of the activities that would be most affected add little to the allocative efficiency of financial markets and broader productivity and economic growth. Some financial trades are merely zero-sum games whereby profits are delivered to the first person to trade on new information. Summers and Summers (1989) and Stout (1995) showed that the amount of resources devoted to capturing trading profits is large.

In recent decades, the economic resources devoted to capturing trading profits have been significant. The advent of high-frequency trading (HFT) and algorithmic trading has resulted in large investments in human capital, physical infrastructure, and proprietary data to develop faster and more advanced trading algorithms.<sup>17</sup> Trading activity has increased dramatically, with U.S. equity trading volumes eight times higher than pre-2000 levels (Avramovic 2017). Yet, there is little evidence to suggest that the added investment in trading and related infrastructure has increased economic growth.<sup>18</sup> Despite the decline in certain measures of trading costs over this period, productivity and business investment growth has been relatively low.<sup>19</sup>

Under an FTT, some trading activity would be discouraged, rendered less profitable, or eliminated. The associated efficiency costs depend on the types of financial transactions that are discouraged and their implications for the allocative efficiency of capital across the economy. The affected activities would likely include both trading that benefits overall market liquidity and price discovery, as well as some trading that has low to negative marginal value. Separating socially beneficial trading from unproductive trading is a difficult—perhaps infeasible—task, and there is no obvious way to exempt from an FTT only the types of transactions that potentially provide value. Yet, current levels of trading are not necessarily optimal, nor is it clear that a decline in trading volume to, for example, levels that existed a decade ago would render financial markets unable to perform their intermediation functions of aiding price discovery and allocating capital efficiently. It seems likely that a meaningful share of the new trading activity that has evolved in recent decades has not significantly enhanced these financial market functions or economic growth. To the extent that some of the discouraged activity consists of zero-sum transactions or acts simply as an additional layer of intermediation, and in some cases rent-seeking, not

all the distortions imposed by an FTT are in fact problematic. This would mitigate efficiency costs of an FTT.

### *Limiting Efficiency Losses*

An FTT should be designed to minimize efficiency losses and the potential for significant tax avoidance. The historical evidence suggests that an FTT that is too high could have adverse effects on financial markets. In addition, depending on how an FTT is designed, there could be significant scope to avoid the tax based on (1) the location of transactions and (2) the particular instruments and institutions that are subject to the tax.

For example, Sweden's failed FTT aptly demonstrates the implications of a poorly designed FTT and the importance of addressing the location of transactions subject to the tax. In 1984, Sweden's introduction of a 100 basis point FTT (increased to 200 basis points in 1986) led to a 5 percent decline in the Stockholm Stock Exchange and significant erosion of trading on Swedish markets (Campbell and Froot 1994; Umlauf 1993). Because the Swedish FTT was imposed only on transactions requiring Swedish brokerage services, market participants could easily avoid the tax by eliminating the use of Swedish brokers and trading on UK and U.S. exchanges. The dramatic declines in trading volume on Swedish exchanges led to tax revenues well below projected levels, and Sweden's FTT was eliminated in 1991.

Many of the problems experienced by Sweden can be addressed through the FTT design, including by applying a lower rate and preventing, as much as possible, the shifting of transactions offshore to avoid the tax. In France and Italy, for example, the FTT applies to trading in shares issued by local companies whether traded onshore or offshore, including trading in American depository receipts (ADRs).<sup>20</sup> To date, analyses of these FTTs have not found significant increases in offshore trading to avoid the tax (Coelho 2016a). In addition, the size and scope of the U.S. financial markets likely makes it more difficult for market participants to shift offshore as they did in Sweden.

It is also important for the FTT design to minimize the potential for investors to shift from taxed to untaxed financial instruments. This is a particular concern for derivatives. Some existing FTTs—such as those in the United Kingdom, France, and Hong Kong—do not apply to derivatives, the taxation of which presents difficult conceptual and administrative issues. However, if derivatives are untaxed, they can be structured to be economically equivalent to the purchase of an underlying security, allowing market participants to avoid the FTT (Shaviro 2012). Contracts

for difference (CFDs), which are widespread in Europe, allow one party to pay the other party the difference between the current value of an asset and its value at a future date. If untaxed, this type of arrangement can be used as a way of escaping the FTT, as has occurred in the United Kingdom and France.

When describing our proposed FTT, we discuss the design choices made to address these potential modes of tax avoidance. More generally, tax enforcement agencies will likely require strong authority to respond effectively to avoidance and evasion. Not all structures that could be used to avoid the tax can be identified at the outset (as evidenced by UK CFDs, which were developed in the 1990s), hence the importance of the annual review we propose during the phase-in period of the tax.

### **ADMINISTRATIVE SIMPLICITY**

An FTT would be relatively simple to administer. While aspects of the design, such as how certain instruments are taxed, require careful calibration, a small tax on each transaction is easy for taxpayers to comply with and straightforward for the tax authority to administer. The significant infrastructure that is already in place to facilitate and report financial market transactions can be used to collect the FTT and decrease compliance costs. Moreover, this financial market plumbing, which includes exchanges, clearinghouses, settlement systems, and intermediaries that facilitate execution, is concentrated in a small number of firms. International FTTs have used this infrastructure in the collection and administration of the tax and generally have low compliance costs relative to the revenue raised (Brondolo 2011).

In the United States, processes that are already in place to collect the SEC Fee for equities could be expanded to collect a broader FTT. For exchange-traded instruments, the small number of exchanges could be responsible for collecting the FTT on all transactions on their platforms. Collecting the FTT on over-the-counter (OTC) transactions likely entails somewhat higher compliance and administrative costs. But, again, processes already in place for equities can likely be expanded to other instruments, with the broker-dealers that execute client transactions assuming primary responsibility for collecting the FTT. Notably, the FTT would not be the only tax for which broker-dealers act as collection agents; for example, they withhold taxes on certain types of investment and dividend income of foreign investors. Though some have suggested excluding OTC transactions from the FTT, doing so could open significant opportunities to avoid the tax.<sup>21</sup>

## The Challenge: Assessing the Effects of an FTT on Financial Markets

The framework outlined above is an appropriate starting place for evaluating the potential role of an FTT in the U.S. tax system. In this section, we supplement that analysis by describing the current state of financial markets and assessing the likely impacts of the introduction of an FTT given the existing market structure and ecosystem. To achieve its objectives, an FTT should be tailored to avoid unnecessary economic and financial market disruption.

### **CURRENT MARKET ECOSYSTEM**

To assess the potential effects of an FTT, it is important to understand changes that have occurred in financial markets over the past several decades. Many markets have shifted from manual trading conducted over the phone or on exchange trading floors to automated electronic systems interacting across a network of trading venues (Joint Staff Report 2015; SEC 2010). In the most liquid markets, technology has increased both the speed and sophistication of trading and has allowed many functions to be automated through computer algorithms responsible for trading decisions, execution, and booking.

The roles and types of financial intermediaries have also evolved. Principal trading firms (PTFs), which typically rely on low-latency, automated trading strategies (i.e., HFT) and take on little net exposure, now represent a significant portion of trading activity in most liquid markets. In standardized asset classes, these firms have become the primary market makers. However, they also employ a variety of strategies beyond liquidity provision, including attempting to capture small arbitrage opportunities between related products, leveraging structural advantages in speed or data, and seeking to anticipate and trade ahead of large orders (SEC 2010). PTFs are primarily prevalent in the most liquid markets, including in on-the-run Treasury securities, large-cap equities and exchange-traded funds (ETFs), futures, and foreign exchange markets.

Automated trading has also facilitated the creation of new investment funds—frequently structured as hedge funds—that focus on algorithmic and quantitative strategies (referred to herein as “algorithmic funds” or AFs). AFs generally rely on sophisticated data and complex models to create automated trading strategies, and they often exploit relatively small price discrepancies. Unlike PTFs, AFs frequently manage outside capital and

take directional positions over longer periods, though their holding periods may still be only days or weeks.

Changes in trading are not limited to these new classes of intermediaries. Large financial firms use HFT and other algorithmic trading in their market-making and trade execution strategies, and long-term institutional investors use algorithms to break up orders and send them across different trading centers to minimize implementation shortfalls. Note that the transformation in trading varies across markets. Less liquid markets, including off-the-run Treasury securities, corporate bonds, municipal debt, and swaps, continue to rely on significant manual trading.

The evidence on the effects of HFT and algorithmic trading on market liquidity, efficiency, and volatility is mixed. Assessing market liquidity itself is complex, and no single definition or all-encompassing metric is available. Most research suggests that HFT and algorithmic trading have improved some measures of market liquidity, such as lowering bid-ask spreads, and have enhanced short-term price discovery (SEC 2014). However, other studies have found that HFT can increase transaction costs, including implementation shortfalls, for larger institutional orders (Tong 2015). HFT and algorithmic trading may also have played a role in recent so-called flash events in key markets including equities, U.S. Treasuries, and foreign exchange (Easley, López de Prado, and O'Hara 2011; Federal Reserve 2019c; Joint Staff Report 2015; Kirilenko et al. 2017).

## **EFFECTS OF AN FTT**

As noted, both theory and historical evidence suggest that an FTT will lower trading activity. The most pronounced effects are likely to be on low-margin, high-volume activity, such as PTF activity, certain AF strategies, and some other forms of intermediation, because they often rely on exploiting relatively small profit opportunities over short holding periods. As a result, even a small FTT may exceed the expected profit or hurdle rate on many of these trades. While comprehensive empirical data on the effects of FTTs in the modern market ecosystem are limited, Colliard and Hoffmann (2017) found that HFT firms (i.e., PTFs) experienced a 35 percent reduction in trading volume following the implementation of France's FTT.<sup>22</sup> This reduction occurred despite design features intended to exempt much of their activity from the tax.<sup>23</sup>

Other forms of intermediation activities also may be affected by an FTT. For example, large broker-dealers make markets in a variety of derivative and other financial products by entering into offsetting transactions to mitigate their risks. These activities can include dynamic hedging, in which they



adjust their position in the offsetting stock, bond, or other instrument as prices change over the life of the contract. If each transaction in a dynamic hedging strategy is subject to an FTT, providing these products could become more costly. These costs may be passed on to institutional investors and corporations hedging their own risks or may reduce the availability of certain derivative products.<sup>24</sup>

The pricing of ETFs would also be affected. ETFs maintain a market price that seeks to replicate the value of the underlying assets they hold by allowing traders to exploit any deviation: if the price of the ETF increases above (or falls below) the value of the underlying securities, market participants buy (or sell) the securities to create (or redeem) the ETF. This arbitrage activity would become more expensive because of the FTT associated with buying or selling securities and as a result would likely require a larger gap between an ETF price and its underlying value before becoming profitable. In addition, PTFs and AFs account for a significant portion of ETF trading. That said, a well-designed FTT would not be expected to prevent continued investment through ETFs.

Finally, investment strategies that encompass more frequent trading may be disproportionately affected by an FTT. For example, factor-based investing, which targets specific return drivers (such as size, value, or momentum) across asset classes, may become less competitive because these investments generally have higher turnover than other funds and as a result would incur more FTT costs.

Importantly, the extent to which the above activities, and markets more generally, would be affected by an FTT is uncertain and depends on the rate and design of the FTT. U.S. equities are already subject to a very low FTT in the form of the existing SEC Fee. At this level of approximately 0.2 basis points, the trading elasticity appears to be relatively low (Auten and Matheson 2010) and the effect on market activities seems to be limited, even among the most sensitive participants, such as PTFs. As the FTT rate increases, progressively more activity would be curtailed: first the highest frequency PTF activity would become unprofitable, followed by other intermediation and short-term AF trading strategies. There is some FTT rate at which the reduction in activities would be harmful to markets, such as Sweden's 200 basis point FTT, yet there is little empirical evidence to pinpoint where between 0.2 and 200 basis points this breakpoint resides. Given current and historical transaction costs, as previously described, the proposed 10 basis point FTT appears unlikely to increase costs beyond manageable levels.

The effect of an FTT on financial markets, the magnitude of efficiency costs, and how those costs are distributed will depend on the relative elasticities of market participants with respect to the tax. For an end investor,<sup>25</sup> the costs of an FTT will include (1) the direct costs of the FTT on their trading activity, (2) any increase in indirect transaction costs as a result of changes in intermediation, and (3) the costs of any broader effects on the availability and cost of capital as well as the allocative efficiency of financial markets that have negative consequences for asset prices, productivity, and economic growth.

Regarding end investor direct costs, a 10 basis point FTT relative to the total expected return of a long-term investment should be relatively small. For example, an individual invested in mutual funds would not incur a direct FTT on the purchase or sale of fund shares. The fund may pass on the FTT costs associated with its trading to the investor, which for a mutual fund with an average level of turnover would imply 3 basis points of additional costs per year, quite small relative to the fees many funds charge.<sup>26</sup>

The indirect costs are less certain and depend on the response of other market participants and the incidence of the tax. Some have speculated that reductions in market making and in trading volume more generally could result in significantly higher transaction costs, such as increases in bid-ask spreads (Securities Industry and Financial Markets Association [SIFMA] 2019a). But, in part, this will depend on how much of the FTT is passed on from intermediaries to end investors. For example, market makers that provide liquidity to other investors could respond to an FTT by (1) increasing bid-ask spreads to offset the cost of the FTT, (2) partially absorbing the cost through lower profits or compensation, or (3) reducing trading activity. The result would likely involve some combination of the three, as the ability to fully pass on these costs has limits due to the competitive nature of financial markets. As bid-ask spreads increase, the value of this intermediation declines, and direct transactions between natural buyers and sellers (i.e., without intermediation by a market maker) may increase, particularly for heavily traded securities.

In addition, much of the activity that would be most affected by an FTT is not dedicated to market making. As a first-order effect, reductions in these activities would be expected to decrease the profits and compensation flowing to the associated firms. Whether these foregone activities would also have indirect costs to end investors through reduced liquidity and higher transaction costs is less clear. Even within PTFs and AFs, there is heterogeneity among strategies that likely affects their potential exposure and response to an FTT as well as their marginal contribution to market

efficiency and liquidity. While some affected activities likely contribute to reducing the cost of transacting and improving price discovery, others may provide limited economic benefit while requiring investments in infrastructure, people, and data that exceed socially optimal levels. Even if a 10 basis point FTT curtails significant trading activity, it would not necessarily materially reduce the efficiency of capital allocation or impose meaningful indirect costs on end investors.

Finally, as noted, some historical studies argue that the direct and indirect increases in transaction costs associated with FTTs could have significant adverse effects on the cost of capital, asset prices, and economic growth. However, the empirical evidence is often based on much higher FTTs than the level proposed here (including flawed FTTs such as the one implemented in Sweden) and relies on data from before the evolution of the modern market ecosystems. Moreover, despite some theoretical models linking liquidity and asset prices (Acharya and Pedersen 2005), little evidence indicates that the magnitude of the change in transaction costs contemplated here would have meaningful effects.

However, the responses of market participants to the proposed FTT are admittedly uncertain, and that is why we propose an incremental implementation. By starting at low levels and phasing the FTT in over several years, a data-driven approach can be employed to assess these key questions and determine the appropriate ultimate FTT level.

## The Proposal

We propose an FTT that would begin at 2 basis points and increase by 2 basis points each year until it reaches a target rate of 10 basis points.<sup>27</sup> This gradual implementation would allow Congress to monitor the effects of the FTT and potentially modify scheduled increases. To support this Congressional review, the U.S. Department of the Treasury, in consultation with market regulators (the SEC and the Commodity Futures Trading Commission) and banking regulators (the Federal Reserve, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation), would be responsible for submitting an annual report assessing market functioning, avoidance activities that arise, and the appropriate calibration of the FTT.

Table 2 describes the key features of the proposal. The FTT would apply to a broad base of financial transactions of stocks, bonds, and derivatives, both on exchanges and OTC, and would be remitted by sellers. It would apply to all transactions involving securities issued in the United States and derivatives linked to securities issued in the United States, as well as

both onshore and offshore trading by U.S. persons to prevent tax avoidance responses.

New equity and debt issuance would be exempted, as would repo and securities lending transactions, money market instruments with terms of less than 90 days, and trading in U.S. Treasury securities. The issuance and redemption of both ETF and mutual fund shares would not be subject to the FTT, though assets sold by mutual funds and trading in ETF shares would be taxed.

For stocks and bonds, the FTT rate would apply to the market value of transactions. For derivatives, both the tax rate and the tax base would need to be tailored to the nature of the contract, as described below in the section on FTT implementation.

Primary responsibility for collecting the FTT would fall to exchanges and—for OTC transactions—broker-dealers.

## **DESIGN**

The two core questions for FTT design are (1) the specification of the tax base and (2) the choice of the tax rate. We discuss the considerations that inform both choices below.

### *Tax Base*

A broad base is desirable in order to limit tax avoidance responses. For this reason, we propose the inclusion of (1) OTC transactions, which are admittedly more difficult to tax than transactions on exchanges; (2) debt instruments, the exclusion of which could, on the margin, increase the existing bias toward debt financing; and (3) derivative transactions, as excluding them would present significant avenues to avoid the FTT. Of note, FTTs in other developed countries have generally excluded debt and most derivative transactions. While their inclusion adds complexity to the FTT, we believe their inclusion is warranted to limit distortions and increase the revenue raised. That said, while the proposed FTT does not appear excessively high relative to transaction costs in non-Treasury fixed income markets, it may be a significant cost relative to expected investment returns. Thus, the effect on these securities would warrant special scrutiny during the implementation phase.

We also propose to include market-making activities in the FTT. Many countries with FTTs (e.g., United Kingdom, France, Italy, and Hong Kong) have included a market-making exemption, but such an exemption is

TABLE 2.

## Key Features of the FTT Proposal

Category	Proposal
<b>Equities<sup>a</sup></b>	<p>The tax rate would initially be 2 basis points of the market value of the transaction (“base rate”).</p> <p>The base rate would be scheduled to increase by 2 basis points each year until the tax rate reaches 10 basis points.</p>
<b>Bonds</b>	Tax would be based on the base rate and the market value of the transaction.
<b>Derivatives</b>	<p>Given the complexity, the FTT rate and base will likely differ by type of instrument to limit differences between economically equivalent transactions (e.g., between purchasing a swap or purchasing the underlying security) and avoidance opportunities. For the purposes of scoring our initial proposal, we assume the following:</p> <p>Options would be taxed at the base rate, based on the premium paid; the base rate would also apply to the value of the strike price if exercised.</p> <p>Security-based swaps would be taxed at the base rate, applied to the notional value.</p> <p>Interest rate swaps would be taxed at the base rate, applied to all cash payments made (excluding interim collateral exchanges).</p> <p>For futures and forwards, rates would vary based on asset class.</p> <p>Certain derivatives, such as those that are functionally equivalent to short-term financing (e.g., foreign exchange swaps with short maturities), would be exempt.</p>
<b>OTC transactions</b>	The FTT would apply to OTC transactions in addition to those on exchanges.
<b>Application</b>	The cost of the FTT would be paid by the seller, as is the case with the SEC Fee.
<b>Equity and debt issuance, redemptions, and repurchases<sup>b</sup></b>	Exempt
<b>Repo and securities lending transactions</b>	Exempt
<b>U.S. Treasury securities and futures</b>	Exempt

<b>Central bank purchases and sales</b>	Exempt
<b>Municipal debt</b>	Not exempt
<b>Money market instruments</b>	Instruments with terms of less than 90 days would be exempt.
<b>Market makers</b>	Not exempt
<b>Direct issuance of annuities and life insurance</b>	Exempt
<b>Mutual funds and ETFs</b>	<p>Issuance and redemption of mutual fund shares would not be subject to the FTT, but the sale of investments by mutual funds would be subject to the FTT.</p> <p>Mutual funds would have the right to charge redemption fees to investors to recoup the FTT costs associated with selling securities when shares are redeemed.</p> <p>The creation and redemption of ETF shares would not be subject to the FTT, but trading in the underlying ETF shares and buying or selling securities by authorized participants (or other market participants acting through ETF authorized participants) to create or redeem the ETF basket would also be subject to the FTT.</p>
<b>Collection</b>	Primary responsibility for collecting the FTT would fall to exchanges and, for OTC transactions, broker-dealers.
<b>Scope</b>	<p>The FTT would apply to all of the following:</p> <p>Onshore and offshore transactions by all investors, including foreign investors, in securities issued by U.S. persons and securities issued by foreign persons in the United States</p> <p>Onshore and offshore transactions by all investors, including foreign investors, in derivatives linked to securities issued by U.S. persons and derivatives linked to securities issued by foreign persons in the United States</p> <p>Onshore and offshore trades by U.S. persons (and their controlled foreign entities) in securities issued by foreign persons</p> <p>Onshore and offshore trades by U.S. persons (and their controlled foreign entities) in non-securities-based derivative transactions</p>
<b>Implementation</b>	The Department of the Treasury, in consultation with the regulatory agencies, will monitor the effects of the FTT and submit an annual report to Congress during the implementation period. The report may include recommendations to modify scheduled increases in the base rate or application to certain financial instruments based on an assessment of the effect of the FTT on financial market functioning, avoidance activities that arise, and revenue raised by the FTT.

a The FTT would apply in same manner and at same rate to publicly traded partnership (PTP) interests of U.S. partnerships.

b Exemption would not apply to a broker-dealer that makes a market in its own debt or equity securities or those of any of its affiliates.

difficult to tailor narrowly and can reduce effectiveness and revenue raised. The lack of a market-making exemption could lead to some cascading of the FTT, with market makers and other intermediaries passing on some portion of the FTT in the form of higher transaction costs. Some experts have also pointed to the risk of more dramatic cascading, with the tax applied multiple times to the set of intermediating transactions involving a broker-dealer, a clearing agent, and a clearinghouse in what is effectively a single transaction. These technical issues can be addressed with a careful definition of the FTT-relevant transaction and through narrow exemptions. For example, under the current SEC Fee, a single trade involving multiple parties, such as a third party that assumes settlement obligations for the trade, is considered only one transaction for purposes of the fee. The SEC Fee rules also exempt a recognized riskless principal sale in which a broker-dealer engages in two contemporaneous offsetting transactions. Similarly, brokered transactions made in the name of a client or that have the sole purpose of executing and clearing the transaction would not be considered individual transactions subject to the FTT.

Some exemptions to the FTT are necessary. We describe these exemptions in table 3.

Two exemptions warrant extended discussion. First, several features of the market for U.S. Treasury securities and futures argue against imposing a 10 basis point FTT. Bid-ask spreads for benchmark U.S. Treasury securities have averaged 1 to 2 basis points over the past several decades. Therefore, an FTT would result in a more significant increase in transaction costs for these markets than for other fixed income markets. This increase could be particularly disruptive given the critical role that Treasury securities serve in the global economy. If the FTT were to affect the value of U.S. Treasury securities, then federal government borrowing costs would increase, offsetting the revenue raised from an FTT.<sup>28</sup>

Second, excluding the issuance and redemption of mutual fund and ETF shares from the FTT prevents the double taxation that could otherwise result.<sup>29</sup> Absent this exemption, in the case of mutual funds, investors would pay an FTT when redeeming fund shares while the fund also would potentially face FTT costs if it needed to sell securities because of changes in its net assets. This exemption is also consistent with the application of the SEC Fee. Admittedly, because of differences in the structures of ETFs and mutual funds, it could result in the FTT being more or less favorable to one structure over the other. But excluding fund issuance and redemption is consistent with the objective of ensuring that an FTT does not have a punitive effect on long-term savings vehicles nor inhibit the ability to

provide low-cost passive investment options.<sup>30</sup> Excluding all mutual fund and ETF trading, on the other hand, would allow funds to become vehicles to avoid the FTT. While the effect on mutual funds and ETFs will need to be monitored as part of an FTT implementation, in an analysis of a proposed European Commission FTT of 20 basis points, BlackRock (2013) estimated that the direct cost would be modest (1 to 4 basis point annual increase in fund expenses) for ETFs replicating the largest equity indices.

### *Tax Rate*

Because the FTT is a gross tax, potentially applying many times to the same asset, the optimal rate (and indeed the revenue-maximizing rate, which is not necessarily the same) is likely to be small. We propose that the rate (applicable to equity, debt, and most derivative transactions) be phased in until it reaches 10 basis points. There is limited empirical evidence to determine the ideal rate, and additional analysis during the implementation period will be beneficial.<sup>31</sup> In the absence of such data, we recommend a rate

TABLE 3.

## Transactions Exempted from the Proposed FTT

Type of exemption	Rationale
Equity and debt issuance, redemptions, and repurchases	These exemptions are consistent with other FTTs as well as the desire to limit the effect on cost of new capital.
Treasury securities and futures	They have consistently low transaction costs, affect government funding costs, and serve a critical role in the global economy, including providing the world's risk-free benchmark.
Money market instruments (with terms of less than 90 days)	They are likely to be highly sensitive to incremental costs or frictions, which could disrupt market functioning. Certain derivatives that are functionally equivalent to short-term financing (e.g., foreign exchange swaps with short maturities) would also be exempt.
Repurchase agreements and securities lending transactions <sup>a</sup>	They play an important role in financial market plumbing and generally have relatively short duration and low absolute return, making them more sensitive to an increase in transaction costs.
Mutual fund and ETF issuance and redemption <sup>b</sup>	This exemption is consistent with the current SEC Fee and avoids double taxation that could otherwise result from end investors buying or selling fund shares.

<sup>a</sup> The FTT would apply to any transactions facilitated by repurchase agreement or securities lending, such as a short sale of a security.

<sup>b</sup> Underlying transactions by mutual funds and trading in ETF shares would be subject to the FTT.



of 10 basis points to strike an appropriate balance between raising revenue and minimizing the efficiency costs of the tax.

While we have proposed that the same rate would apply to equity and debt transactions, the appropriate rate for each, and whether they should differ, will require further study during the implementation period. For many debt investments, a 10 basis point FTT would represent a higher portion of the expected cumulative return than would likely be the case for an equity investment of similar duration. This may be particularly true in the current low interest rate environment and for lower-risk municipal and investment grade securities. Therefore, it may be the case that the rate for debt securities, after the phase-in period, should be less than 10 basis points.<sup>32</sup>

Regarding derivatives, a sensible aspiration for an FTT is to subject economically equivalent transactions to the same tax rate, thereby avoiding any distortions in the composition of financial transactions. In particular, the FTT rate (or schedule of rates) would need to avoid creating an incentive to shift activity between cash and derivative instruments. As Matheson (2012) points out, because financial products that represent the same economic value can be structured in myriad ways with different transaction intensities, it is generally not possible to design an FTT that taxes all economically equivalent contracts identically. There are multiple ways to structure the same economic payout through derivatives, and it would not be possible to capture all such differences in a functional tax regime.

However, attempts can be made to design the tax rate and base applied to derivative transactions to limit distortions and opportunities for tax avoidance. Some FTT proposals focus on the notional value of derivatives, often applying a lower tax rate to derivatives on this basis. Others only tax the amount of any payments made under the derivative contract. However, both methods present potential problems if applied to all types of derivatives. Notional values can be manipulated to reduce the tax, and applying a lower rate on certain products (or applying the FTT only to the payments made under the contract) can result in a lower FTT on certain derivative products (e.g., a total return swap) relative to equivalent stock and bond purchases.

Given the complexity of derivatives, the FTT rate and base will likely need to be differentiated by type of instrument to limit differences between economically equivalent transactions. In some cases, such as total return swaps and other securities-based swaps, it is appropriate to apply the base rate to notional value so that the FTT levied on such transactions is comparable to that of acquiring the underlying securities. In other cases,

such as interest rate swaps in which the magnitude of the notional value is significantly larger than the expected cash flow, the cash payments made under the contract may be a more accurate representation of value exchanged, and thus applying the FTT to these amounts may be more appropriate.

A well-functioning FTT will also require strong enforcement and anti-evasion powers.<sup>33</sup> For example, an anti-abuse rule could specify that if a derivative transaction were “substantially equivalent” to owning the underlying securities, the transaction would be taxed at the same level.<sup>34</sup>

## **ADMINISTRATION**

Primary responsibility for collecting the FTT would fall to exchanges and—for OTC transactions—broker-dealers. In implementing its current fees on equities, options, and security futures, the SEC has already identified mechanisms to measure transaction volume and collect the fee through exchanges and broker-dealers and their self-regulatory organizations.

Extending the FTT to bonds and all derivatives would likely require the development of new systems and processes but could also leverage the existing roles played by exchanges, clearinghouses, settlement systems, and broker-dealers to facilitate collection and compliance. Even for OTC transactions, many are cleared, settled, and often intermediated by large broker-dealers.

## **IMPLEMENTATION**

Our proposal is designed to accommodate implementation issues, foreseen and unforeseen, through a gradual transition process. Implementation of an FTT in the United States should be incremental, starting at low rates, so that its effects on financial markets can be measured and assessed.<sup>35</sup> The U.S. Department of the Treasury, in consultation with the regulatory agencies, should provide an annual assessment to Congress so that any necessary adjustments can be enacted. This assessment is especially important because of the limited empirical evidence about the effects of a significant, broad-based FTT. Most of the historical experience is with much smaller FTTs (e.g., the SEC Fee) or FTTs with significant exemptions (e.g., the UK Stamp Duty and FTTs in France and Italy). The implementation period would also allow Congress to make adjustments to address avoidance techniques that will undoubtedly arise and make more precise and data-driven assessments of the optimal FTT level, which may ultimately be above or below 10 basis points.

Another key implementation concern is that of harmonization with foreign markets and governments. Ideally, an FTT would be implemented in coordination with other countries, and we recommend that U.S. policymakers actively work with foreign counterparts to implement FTTs in line with that proposed here. Given the size and scope of U.S. financial markets, an FTT in the United States could pave the way for adoption more broadly.

In the absence of global coordination, the United States could take several steps to minimize offshore shifting and any negative effects on the competitiveness of U.S. capital markets. The tax could apply to all trading in securities issued in the United States and derivatives linked to securities issued in the United States, regardless of whether the trade is executed onshore or offshore. The FTT also could be applied to all onshore and offshore trades by U.S. persons (and their controlled foreign entities) in securities issued by foreign persons to prevent incentives to shift investments from taxable U.S. securities to nontaxable foreign securities. Similarly, for derivative transactions that do not reference a security (e.g., interest rate swaps), the FTT could apply to all transactions involving a U.S. person.<sup>36</sup>

While there would undoubtedly still be some efforts to shift trading offshore in order to avoid an FTT, this concern is likely overstated in the case of the United States. The United States accounts for over 40 percent of global equity and corporate bond markets (SIFMA 2019b) and is home to many of the largest global financial intermediaries. Given the size and centrality of U.S. markets, market participants have a limited ability to avoid trading on U.S. exchanges, in products cleared and settled over U.S. financial utilities, or with large U.S. intermediaries.

FTT compliance for offshore trading by U.S. persons could be facilitated by requiring collections by broker-dealers, clearing agencies, custodians, transfer agents, and other intermediaries. For example, large broker-dealers that intermediate most global OTC transactions would be responsible for collecting the FTT for offshore transactions with U.S. persons, even if the transaction is conducted through their non-U.S. subsidiaries.

Importantly, the proposed FTT also would apply to transactions by foreign investors in U.S. markets.<sup>37</sup> As a result, the FTT from foreign investors would likely represent a significant source of revenue.

## POTENTIAL REVENUE RAISED

Previous estimates suggest that an FTT could raise substantial sums. Assessing a 10 basis point tax on most financial transactions, the Joint Committee on Taxation projected that it would raise \$777 billion over 10 years (Congressional Budget Office 2018). Burman et al. (2016) estimated slightly lower revenue—\$705 billion over 10 years for a 10 basis point FTT—and found that a much larger 50 basis point FTT would raise only \$806 billion over 10 years, with behavioral responses that lead to reduced trading volumes limiting the incremental revenue. Some have estimated more significant, but likely overstated, revenues from a higher FTT. For example, Pollin, Heintz, and Herndon (2018) estimated that a 50 basis point FTT would raise approximately \$220 billion per year, or more than \$2 trillion over 10 years, due to much lower elasticity and higher trading volume assumptions.<sup>38</sup>

Table 4 provides revenue estimates for our proposal developed by TPC.<sup>39</sup> The proposal would yield approximately \$60 billion in annual revenue once the tax is fully phased in, and it would generate over \$500 billion between 2020 and 2030.<sup>40</sup> The revenue estimate is based on a dynamic analysis that includes the effects of declines in trading volumes, assuming an elasticity of  $-1.25$ , and other responses to the implementation of the FTT.<sup>41</sup> A lower

TABLE 4.

### Federal Revenue Estimates

Fiscal year	Revenue raised (in billions)
2020 <sup>a</sup>	-\$31.9
2021	\$10.2
2022	\$41.7
2023	\$52.3
2024	\$59.0
2025	\$61.4
2026	\$61.2
2027	\$61.8
2028	\$62.9
2029	\$64.0
2030	\$65.2
<b>Total</b>	
2020–30	\$507.7

Source: Urban-Brookings Tax Policy Center (TPC) calculations.

<sup>a</sup>To be consistent with the methodology utilized by the Joint Committee on Taxation, the estimates assume an asset price decline following enactment of the FTT in 2020 that reduces capital gains tax revenue.

elasticity assumption of  $-1$  (i.e., less decline in transaction volumes) would result in 2020–30 estimated revenue of \$628 billion, while the estimated revenue under a higher elasticity assumption of  $-1.5$  is \$412 billion.

Table 5 presents estimates of the distribution of the FTT burden in 2030 based on the TPC Microsimulation Model. As noted, the tax would be highly progressive: nearly 70 percent of tax burden would fall on taxpayers in the highest income quintile, and 23 percent falls on the top 1 percent.

These estimates may understate the concentration among those at the top of the income spectrum if the FTT reduces financial sector rent-seeking (Burman et al. 2016). The proposal also is even more progressive when calculating the tax burden across the wealth distribution. As noted in figures 1 and 2, the distribution of financial asset ownership by household wealth is extremely concentrated—even more so than the distribution by household income that underlies Table 5.<sup>42</sup> Nevertheless, the analysis shows that our proposed FTT is a highly progressive tax with a burden of over \$12,000 for households in the top one percent of the income distribution compared to just \$10 for those in the bottom quintile. Those with no financial assets outside of bank accounts would pay nothing at all.<sup>43</sup>

TABLE 5.

## Distribution of Federal Tax Change by Cash Income Percentile

Expanded cash income percentile <sup>a,b</sup>	Share of total		
	federal tax change	Change in after-tax income <sup>c</sup>	Average federal tax change
Lowest quintile	0.8%	-0.1%	\$10
Second quintile	3.8%	-0.1%	\$60
Middle quintile	9.5%	-0.2%	\$160
Fourth quintile	16.2%	-0.2%	\$330
Top quintile	69.1%	-0.4%	\$1,690
All	100.0%	-0.3%	\$350
80th–90th percentiles	13.3%	-0.3%	\$630
90th–95th percentiles	13.1%	-0.4%	\$1,290
95th–99th percentiles	20.1%	-0.5%	\$2,600
Top 1 percent	22.6%	-0.5%	\$12,110
Top 0.1 percent	9.1%	-0.5%	\$47,650

Source: Urban-Brookings Tax Policy Center (TPC) calculations.

Note: Estimates are for 2030. Baseline is the law in place as of January 1, 2019. Distribution is based on a dynamic estimate including behavioral responses. The dynamic estimate understates the burden of the FTT because the behavioral change itself imposes costs on taxpayers.

<sup>a</sup>Includes both filing and non-filing units but excludes those that are dependents of other tax units. Tax units with negative adjusted gross income are excluded from their respective income class but are included in the totals. For a description of expanded cash income, see Urban-Brookings Tax Policy Center (2019).

<sup>b</sup>The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The breaks are as follows (in 2019 dollars, based on tax year 2030): 20%, \$30,200; 40%, \$59,200; 60%, \$103,500; 80%, \$183,200; 90%, \$264,000; 95%, \$382,500; 99%, \$915,400; and 99.9%, \$4,199,600.

<sup>c</sup>After-tax income is expanded cash income less the following: individual income tax net of refundable credits; corporate income tax; payroll taxes (Social Security and Medicare); estate tax; and excise taxes.

## Questions and Concerns

### *1. Would exempting Treasury securities from the FTT distort debt markets?*

The U.S. Treasury market is already distinct from other fixed income markets. It is the deepest and most liquid government securities market in the world and plays a critical role in the global economy. It provides the world's risk-free benchmark, facilitates the implementation of monetary policy, provides the financial system high-quality collateral, helps businesses to manage their risks, and finances the federal government. Treasuries already enjoy significant liquidity advantages, including much lower transaction costs, relative to other debt securities. The FTT proposed here is unlikely to meaningfully change these dynamics.

### *2. Would a 10 basis point FTT be too high for debt securities given the current low interest rate environment?*

The implementation period is intended to allow further assessment of optimal FTT rates, including whether a lower rate may be warranted for debt securities. For secondary investments in debt securities, a 10 basis point FTT would represent a higher portion of the expected cumulative return than for an equity investment of similar duration, particularly given current low interest rates. By initially applying an FTT of 2 basis points and gradually increasing the rate, this proposal allows the effect on secondary debt markets and borrowing costs to be monitored to assess whether changes in the scheduled FTT rate increases, and a differentiated rate for debt securities, are needed.

A lower FTT rate may be more appropriate for shorter-term debt securities. The proposed FTT would not apply to money market instruments with terms of less than 90 days or the issuance or redemption of securities. However, for secondary sales of short-term debt that does not fall under the exemption, the FTT would represent a higher portion of the expected cumulative return until maturity than for longer-term debt. To address this concern, some have called for the FTT tax rate applied to debt instruments to be scaled on the basis of the time remaining until maturity. While this gradation would add complexity to the FTT and has not been incorporated in this proposal, these dynamics should be monitored during the implementation period to assess any disproportionate effect on short-term securities or changes in issuance practices.

### *3. Would applying an FTT to municipal securities raise borrowing costs?*

The proposed FTT does not appear to represent a dramatic increase in transaction costs for municipal securities. However, the addition of a 10

basis point FTT, particularly in the current low interest rate environment, could result in investors demanding higher yields. Therefore, the effect on municipal securities should be monitored during the implementation phase to assess whether changes in the FTT rate are warranted.

*4. Does the proposal sufficiently differentiate between types of derivative transactions to avoid increasing hedging costs?*

The proposal includes examples of areas in which the application of the FTT may differ by derivative product. For example, the FTT may be applied to the notional value for products linked to securities (e.g., total return swaps) while for other products it may be more appropriate to apply the FTT to cash payments made under the contract. However, given the complexity of derivatives, further differentiation by type of instrument, which goes beyond the scope of this paper, will likely be needed.

The proposal envisions the application of the FTT to a broad range of derivative products, including those that may be used in hedging transactions. At a high level, we propose that the types of products used in hedging transactions, such as those linked to interest rates, would be subject to the FTT based on the actual payments made under the contract. These payments may be a more accurate representation of value exchanged, and they may be much lower than the notional value. Along with the low rate of the FTT, this design is intended to prevent an excessive increase in the costs of these products. However, the effect of the FTT on the cost of hedging products and other derivatives should be monitored during the implementation phase.

*5. Should pension funds receive an exemption, such as a tax credit for long-term holdings?*

The direct cost of the FTT on low-turnover, long-term investment strategies would be expected to be low (i.e., 10 basis points amortized over multiple years). Thus, the value of an exemption tied to long-term holdings is likely limited. In addition, as noted above, additional exemptions may add to the administrative complexity of the tax.

*6. Would middle-income families face significant FTT costs?*

Most households do not make large direct investments in stocks or bonds<sup>44</sup> or trade frequently, and as a result they would face limited direct FTT costs. Even if a household made a \$10,000 stock purchase, the fully phased-in FTT cost of the transaction would be only \$10.

A number of factors also would likely limit the direct FTT costs associated with investments in funds and retirement accounts, through which



the majority of middle-income household financial assets are held. The purchase and redemption of mutual fund shares would not be subject to the FTT.<sup>45</sup> While the sales of securities held by the funds would be subject to the FTT, the ultimate cost borne by investors will depend on the trading frequency and strategy employed. For a mutual fund with an average level of turnover, the direct FTT cost would represent approximately 3 basis points per year. Many index funds have even lower turnover levels: an S&P 500 index fund with 4 percent turnover would face direct FTT costs of 0.4 basis points per year. For an average family in the middle quintile, with \$47,000 in combined pooled investment fund and retirement account financial assets,<sup>46</sup> this incremental annual FTT cost would amount to \$14 if its investments were in mutual funds with average turnover and \$2 if its investments were in low-turnover index funds.<sup>47</sup>

In addition, any savings held through bank accounts, certificates of deposit, or insurance products such as annuities would not be subject to the FTT.

## Conclusion

The desire of policymakers to raise more revenue in a progressive way has led to a number of tax reform proposals, some of which entail the creation of new tax instruments. Our proposal for an FTT is another such option.

While some financial market activity would be discouraged by an FTT, we do not believe an FTT would hinder market functioning or impede price discovery. Moreover, some of the foregone activity may be of limited marginal economic benefit. Because the precise responses of market participants to the proposed FTT are admittedly uncertain, we propose that the tax be phased in over a four-year implementation period. This plan would allow policymakers to monitor market functioning, address avoidance techniques that will undoubtedly arise, and further refine and adjust certain elements of the proposal, supported by the data that would be collected.

At the moderate rate we propose, an FTT would raise substantial revenue, and the burden would fall overwhelmingly on high-income taxpayers. As part of a broad portfolio of progressive tax reforms, such an FTT can help pay for existing public obligations as well as the public investments that underlie future economic growth.

## Glossary of Terms

**Algorithmic fund (AF):** Funds that rely on sophisticated data and complex models to create automated trading strategies and often take directional positions to exploit relatively small price discrepancies over days or weeks.

**American depositary receipt (ADR):** A certificate issued by a U.S. depository bank representing shares of a non-U.S. company deposited in a foreign bank. ADRs are traded in U.S. markets and were created to make it easier for U.S. actors to invest in foreign companies.

**Contract for difference (CFD):** A contract where one party agrees to pay the other party the difference between the current value of an asset and its value at a time specified in the contract.

**Derivative:** A contract between two or more parties, the value of which is based on an agreed-upon underlying financial asset or set of assets.

**Exchange-traded fund (ETF):** An investment fund that invests in a basket of stocks, bonds, or other assets and is traded on a stock exchange.

**Futures contract:** A derivative contract traded on an organized exchange to buy or sell assets at a fixed price, to be delivered and paid for on a designated date in the future.

**High-frequency trading (HFT):** A form of automated trading that uses extraordinarily high-speed and sophisticated computer programs for generating, routing, and executing orders across a variety of trading venues to maximize trading efficiency.

**Option:** A type of derivative contract that gives the holder the opportunity but not the requirement to buy or sell the underlying asset at a set price.

**Over-the-counter (OTC) trading:** Trading that takes place off of official exchanges, including trades through alternative trading systems; it can involve instruments that are listed on exchanges or those that are not listed on any exchange.

**Principal trading firm (PTF):** A firm that typically relies on proprietary, low-latency, automated trading strategies, takes on little net exposure, and often manages limited outside funds.

**Swap:** A derivative contract through which two parties exchange cash flows or liabilities from two different financial instruments.

**Value-added tax (VAT):** A consumption tax that is collected as a percentage of the value added at each step in a product's supply chain.

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## Endnotes

1. For example, the Tax Cuts and Jobs Act of 2017 reduced the corporate income tax rate and increased the estate tax exemptions, while the Patient Protection and Affordable Care Act of 2010 included an incremental 3.8 percent tax on net investment income, including capital gains, for individuals with high income.
2. It would not apply to initial equity and debt issuances.
3. Several factors may limit the applicability of Hong Kong's FTT to the United States, including Hong Kong's significantly smaller economy and the benefits it may realize from having a more predictable regulatory environment than other financial markets in its region.
4. This includes the SEC Fee of 0.207 basis points, exchange fees of up to \$0.0030 per share (i.e., 0.30 basis points on a \$100 share of stock), and commissions. For institutional transactions, commissions over recent years have averaged 3 to 5 basis points (Virtu Financial 2019). For retail transactions, until recently many online brokers charged approximately \$5 per trade (e.g., see Huang 2018), which would equate to approximately 10 basis points for a trade of \$5,000. However, recently several retail brokerages have eliminated trading commissions (e.g., see Baer 2019).
5. This includes both direct costs (e.g., SEC Fee, commissions) and indirect costs (e.g., implementation shortfall). Institutional orders of smaller-cap stocks have higher transaction-related costs: Virtu Financial (2019) estimates total average costs of 50 to 60 basis points for mid-cap and 80 to 90 basis points for small-cap stocks. Retail estimate based on commissions of \$0 to \$5 per trade and half of estimated bid-ask spreads of 1 basis point for large-cap stocks (authors' calculations based on S&P 500 stocks) and 5 basis points for small- to mid-cap stocks (authors' calculation based on shares of stocks with market cap between \$500 million and \$10 billion).
6. Virtu Financial (2019) estimates a decline in institutional costs per transaction of approximately 15 basis points, or 30 basis points combined to buy and later sell a security (a "round-trip" transaction), compared with the proposed FTT of 10 basis points per round-trip transaction.
7. Mizraich (2015) estimated a decline in corporate bond bid-ask spreads of 40 to 60 basis points from 2003 to 2015. Wu (2018) estimated significant declines in effective spreads for municipal securities transactions between 2005 and 2018, particularly for smaller trades. Adrian, Fleming, and Vogt (2017) found average bid-ask spreads from 1991 to 2000 to be fairly comparable to those for 2001 to 2017 but found higher price impacts (16.8 basis points per 100 net trades for the 2-year note, 31.3 for the 5-year note, and 54.5 for the 10-year note).
8. For example, foreign holders own approximately 15 percent of U.S. corporate equities (Federal Reserve 2019b).
9. For example, in 2018 Vanguard had annual portfolio turnover of 3 percent for its Total Stock Market Index Fund, 4 percent for its S&P 500 Index Fund, 9 percent for its Total World Stock Index Fund, and 54 percent for its Total Bond Market Index Fund.
10. Understanding the longer-run distribution of the FTT burden is complex and will depend on a

number of factors, including effects on cost of capital and relative elasticities of supply and demand for capital and labor (see, e.g., Baker and Woo (2015) for a discussion of the issues around the economic incidence of an FTT). To the extent that an FTT raises the cost of capital, some of the tax burden will fall on owners of capital. Any reduction in the after-tax return on capital investments would reduce the capital stock in the economy. As a result, some of this tax burden would be passed on to workers as they become less productive. How these tax burdens are allocated depends on the relative elasticities of supply and demand for capital and labor, in addition to the extent to which financial intermediaries pass on the tax to investors.

11. Diamond and Mirrlees (1971) show that, under certain conditions, taxes on intermediary inputs to production are less efficient than taxes on final outputs or taxes on intermediate inputs that are creditable (e.g., a value-added tax).
12. The FTT would compound the costs of existing taxes on complementary activities, such as corporate investment and savings. An additional tax on securities transactions would also compound the investor “lock-in” effect by increasing the disincentive to sell assets that appreciated in value. Depending on its design, an FTT could also contribute to debt bias, in which debt receives more favorable tax treatment than equity. Our proposed FTT would apply equally to debt and equity, though a differential effective tax rate could arise through differences in trading frequencies across asset classes.
13. See, for example, Jackson and O’Donnell (1985) in the United Kingdom; Lindgren and Westlund (1990), Umlauf (1993), and Campbell and Froot (1994) in Sweden; and Buchanan (2012), Colliard and Hoffmann (2013), Haferkorn and Zimmermann (2013), Meyer, Wagener, and Weinhardt (2013), and Coelho (2016a) in France.
14. The theoretical effect of an FTT on asset prices is ambiguous, as an FTT would generally increase both the liquidity premium and rate of return required by investors to hold stocks, putting downward pressure on stock prices (Habermeier and Kirilenko 2003; Kupiec 1996; Matheson 2012; McCrae 2002; Schwert and Seguin 1993). However, if an FTT reduces excessive volatility, the required risk premium would fall and could lead to higher stock prices (Vayanos 1998).
15. For example, a partial equilibrium model, such as that presented in Matheson (2012).
16. Others have suggested that if there is a sufficient proportion of noise traders that creates a wedge between the fundamental value of a stock and its market price, an FTT could reduce short-term speculation and, as a result, the noise-to-fundamental ratio in market prices (Stiglitz 1989; Summers and Summers 1989; Tobin 1978). These taxes may, instead, discourage a sufficient amount of fundamental-based trades, reducing price discovery and increasing volatility (Edwards 1993; Grundfest and Shoven 1991; Kupiec 1996; Schwert and Seguin 1993). Dávila (2013), however, suggests that volatility effects are uninformative as a metric for the efficiency costs of an FTT.
17. This is not to say that significant resources were not devoted to trading, or large market-making profits, prior to the development of HFT and algorithmic trading. In many cases, automated processes replaced functions that had been previously performed manually, reducing the required human capital.
18. Cecchetti and Kharroubi (2012) show that in advanced economies, a fast-growing financial sector has been detrimental to aggregate productivity growth.
19. Philippon (2015) finds that despite the advancements in data and technology, the per-unit cost of intermediation has remained stable since the 1900s.
20. An ADR is a negotiable certificate for shares of a non-U.S. firm that are deposited in a foreign bank. ADRs were created to enable U.S. investors to more easily trade shares in foreign companies.
21. To limit tax avoidance the proposed FTT would also require tax collection for offshore trades made by U.S. persons. This requirement could be facilitated by requiring collections by broker-dealers, clearing agencies, custodians, transfer agents, and other intermediaries.
22. Consistent with the notion that a small FTT would cause larger behavioral responses for HFTs, Coelho (2016a) finds a much larger lock-in elasticity for HFTs than for traditional traders ( $-9$  versus  $-0.8$ ).
23. For example, France’s FTT exempts market-making activity and only applies to net daily position changes. While France also implemented a 1 basis point tax on the notional amount of modified or cancelled messages by HFTs exceeding an order-to-trade ratio of 5:1, it applies only to HFTs residing in France and excludes market-making activity, and as a result it is believed to have had

- minimal impact (Colliard and Hoffmann 2017).
24. It is also possible that an FTT could result in greater concentration in intermediation and other market making if larger intermediaries have greater capacity to manage these costs.
  25. That is, the individuals and institutions that are the ultimate beneficiaries of financial investments.
  26. For example, based on average annual turnover of 32 percent (Investment Company Institute 2019) and \$47,000 of average combined pooled investment fund and retirement account financial assets for a middle-income family (calculated based on Federal Reserve 2017), this would represent approximately \$14 per year.
  27. Bernstein (2015) also proposed a multiyear phase-in period, though with a lower final FTT rate of 3 to 5 basis points.
  28. Burman et al. (2016) estimated that a 10 basis point FTT on U.S. Treasury and Agency securities would increase federal borrowing costs by \$390 billion over 10 years.
  29. To prevent mutual funds from being used as a means of avoiding the FTT, by for example establishing a single-stock mutual fund with the purpose of allowing trading in the security without incurring the FTT, this exemption could be limited to “diversified” funds (as defined in the Investment Company Act), which cannot hold more than 5 percent of their assets in a single security and cannot hold more than 10 percent of the securities of a single issuer.
  30. Mutual funds would also have the ability to pass on any expected redemption-related FTT costs through redemption fees rather than absorbing them through higher fund expenses that affect the remaining investors.
  31. In a simple linear tax model, Coehlo (2016b) finds that the overall implied revenue-maximizing FTT is 67 basis points, and that for high-frequency trading is lower, at 2.2 basis points. The lower 2.2 basis point rate is unlikely to generate meaningful levels of revenue, while the implied rate based on revenue considerations alone is likely to significantly distort real economic activities.
  32. Similarly, some have called for the FTT tax rate applied to debt and some derivative instruments to be scaled on the basis of time until maturity. While this gradation would add complexity, it also warrants further study.
  33. Some countries also require financial instruments to be “stamped” to demonstrate payment of the FTT. An unstamped document cannot be relied upon nor can it be used for legal purposes, such as registering a transfer of ownership.
  34. This is analogous to how the United States treats tax withholdings for nonresidents with regard to payments on derivatives that are substantially equivalent to dividends on the underlying securities.
  35. We also anticipate a period between enactment of the FTT and its initial implementation to allow the financial services industry to establish the necessary systems and procedures.
  36. “U.S. person” is defined in existing Commodity Futures Trading Commission regulations for swap markets.
  37. Unlike capital gains taxes, FTTs are not covered under U.S. tax treaties.
  38. The plan analyzed by Pollin, Heintz, and Herndon (2018) assumed a 50 basis point FTT on equity securities, a 10 basis point rate on bond transactions, and 0.5 basis points on the notional value of derivatives transactions. TPC revenue estimates of the same plan are significantly lower (i.e., \$52 billion in the first year, relative to the \$220 billion estimate in Pollin, Heintz, and Herndon 2018). For details on the differences between the two estimates, see Nunns (2016).
  39. We thank Chenxi Lu, Thornton Matheson, and Eric Toder for providing estimates of the proposal using the Urban-Brooking Tax Policy Center Microsimulation Model.
  40. As a point of comparison to other avenues to increase federal revenues, the Joint Committee on Taxation estimated that increasing income tax rates on the two highest brackets 1 percentage point would raise \$123 billion over 10 years, and increasing tax rates on capital gains and dividends 2 percentage points would raise \$70 billion (Congressional Budget Office 2018).
  41. The dynamic estimates account for the following effects: taxpayers’ behavioral responses, including reductions in transactions based on an elasticity estimate of  $-1.25$ ; income and payroll tax offset; delay in reporting systems; ongoing capital gains revenue loss; and capital gains capitalization effect.
  42. Another factor affecting the tax distribution is that high-income households are more likely to have investments in privately held businesses, which would not incur FTT costs because they are not regularly traded. TPC excluded investments in privately held businesses and real estate for the purposes of distributing the FTT tax burden.

43. It may be surprising that the distribution of the tax burden is not even more progressive than shown in table 5. There are three main reasons for this: First, not all wealth is held in financial assets. For example, some high-income households' principle assets consist of real estate and/or privately held businesses that are not affected by the FTT. The distribution of total wealth is slightly more progressively distributed than that of financial wealth: The top one percent hold 26 percent of total wealth, as contrasted with 23 percent of noncash financial wealth. Second, noncash financial assets is a broad measure, and there is considerable variation in the distribution of its component assets. While bonds—particularly tax-exempt bonds—and directly held stock are distributed quite progressively, other components, such as pension and life insurance assets, are much less so. Third, income and wealth are imperfectly correlated. To illustrate, some high-income households hold little financial wealth (e.g., young high-income households who have not saved much yet in their lifetimes) and some middle-income households have sizable financial assets (e.g., retired households with assets that generate relatively little income in a given year). The distributional analysis includes these costs, distributed to households on the basis of their noncash financial assets.
44. The average family in the middle-income decile has direct stock holdings of approximately \$7,000 (calculation based on Federal Reserve 2017).
45. The mutual fund would have the ability to charge investors redemption fees to pass on the FTT costs associated with any necessary selling of securities. Trading in ETF shares would be subject to the FTT.
46. Calculation based on Federal Reserve (2017).
47. The small impacts on the middle class shown in the distributional analysis come from those middle-income households with larger asset holdings or those with substantial pension and insurance assets that would face indirect costs.

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