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The Incidence of Financial Transactions Taxes

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Introduction

As financial transactions taxes (FTT) have moved to be part of the mainstream debate on tax policy, there has been increased attention to the incidence of such taxes. This is an important aspect to the debate, since the merits of the tax will depend to a substantial extent on who will end up bearing the burden. There are three key issues in making this assessment:

1) Which groups directly bear the burden in the sense of carrying through trades that will be subject to the tax;
2) The extent to which tax payments will be offset by a reduction in trading volume, which lowers transaction costs; and
3) The extent to which reduced trading will lead to a less efficient allocation of capital, and therefore reduce growth and output.

The issues associated with the first point are straightforward, even if the data may not be as clear as would be desirable. The allocation of the tax will be in proportion to the volume of trading by each income group, however, there are not reliable data for trading by income group. As a first approximation, it can be assumed that trading is proportional to the financial assets held by each income group. These data are available from the Federal Reserve Board's Survey of Consumer Finances.

The second issue depends on the elasticity of trading volume with respect to the cost of trading. If trading is very responsive to changes in transactions costs, then reductions in trading volume can offset much or even all of the tax. Investors may have to pay the tax on trades they conduct, but they will save money on other transactions costs because they do less trading. There is research that provides evidence on trading elasticity, although it does leave a wide range of uncertainty.

The third issue is the most important one. If the high current volume of trading is somehow leading to a better allocation of capital, then reducing trading volume will lead to a less efficient allocation of capital. In this case, FTTs will lead to slower growth and less output. Here, the incidence of the tax depends on the apportionment of this lower level of output. Insofar as it means lower returns to capital, households will lose if they own capital. Insofar as it means lower returns to labor (i.e. lower wages) households will lose if they have workers relying on labor income.

This paper discusses these issues in further detail, assessing what the evidence shows on each issue.

Trading Volume by Income Group

The Federal Reserve Board fields the Survey of Consumer Finances every three years. This survey is designed to produce estimates of the wealth and liabilities of households, with a breakdown by asset type. The most recent survey was fielded in 2013. **Table 1** shows the breakdown of holdings of financial assets that could be subject to an FTT by income quintile with the top quintile spilt in half.[1]

TABLE 1

Average Holdings by Income Percentile

(thousands of 2013 dollars)

Percentile of Income	Bonds	Stocks	Pooled Investment Funds	Retirement Accounts	Cash Value, Life Insurance	Other Managed Assets	Total
Less than 20	*	$2.3	$4.7	$3.8	$0.9	$1.2	$12.9
20–39.9	$2.0	$3.5	$3.2	$11.6	$1.9	$3.5	$25.7
40–59.9	$0.8	$7.9	$6.6	$36.1	$3.2	$4.3	$59.0
60–79.9	$1.7	$14.3	$11.1	$86.2	$4.9	$11.6	$129.8
80–89.9	*	$33.1	$28.9	$185.1	$6.7	$21.3	$275.1
90–100	$71.5	$315.2	$298.7	$530.2	$39.3	$131.2	$1,386.1

Source and notes: Federal Reserve Board (2013). * indicates fewer than 10 people in the sample.

The table shows that the holdings among the bottom two quintiles of most of the assets likely to be affected by an FTT are trivial. Few people in these income categories have any substantial amount of financial assets. Insofar as they have wealth, it typically is in the form of equity in their home.

TABLE 2

Share of Holdings by Income Percentile

Percentile of Income	Bonds	Stocks	Pooled Investment Funds	Retirement Accounts	Cash Value, Life Insurance	Other Managed Assets	Total
Less than 20	*	1.2%	2.5%	0.8%	2.5%	1.3%	1.2%
20–39.9	5.0%	1.7%	1.7%	2.3%	5.5%	3.6%	2.4%
40–59.9	2.1%	3.9%	3.5%	7.3%	9.5%	4.4%	5.6%
60–79.9	4.3%	7.1%	5.9%	17.4%	14.5%	11.9%	12.3%
80–89.9	*	8.2%	7.6%	18.7%	9.9%	11.0%	13.0%
90–100	88.6%	77.9%	78.9%	53.5%	58.0%	67.7%	65.5%

Source and notes: Federal Reserve Board (2013). * indicates fewer than 10 people in the sample.

1 Federal Reserve Board (2013). The numbers in Table 1 were obtained by multiplying the percentage of families reported as holding each asset as shown in Table 6.13 of the 2013 Survey, but the means for those who hold the asset, as reported in Table 6.13 means, both available at http://www.federalreserve.gov/econresdata/scf/files/scf2013_tables_internal_real.xls.

Table 2 shows the percentage of each asset class held by income quintile, along with a percentage for these six categories taken together. As a practical matter, some of these assets are more likely to be subject to an FTT than others, but as a first approximation, it is reasonable to sum them together, effectively assuming that the tax applies to them all equally. The top decile of the income distribution holds more than half of all the assets included, with the top quintile accounting for more than 80 percent of every asset except for retirement accounts and the cash value of life insurance. Overall, the top decile holds more than 65 percent of the listed assets, with the top quintile accounting for more than 78 percent.

If the incidence of the tax is proportional to holdings, then clearly the top quintile will pay the overwhelming majority of the FTT. In fact, the shares shown in Table 2 likely understate the extent to which the incidence would fall on the top income decile since the assets held in substantial quantities by the lower quintiles — life insurance and retirement accounts — are likely to be less affected by an FTT than directly held assets. On the other side, this calculation does not include assets held by defined benefit pension funds, which would also be subject to the tax. Netting the two out, Table 2 likely gives a reasonable approximation of the distribution of the assets that will be subject to an FTT.

Elasticity of Trading

There have been several studies over the last few decades that have attempted to estimate the elasticity of trading volume with respect to the cost of trading.[2] It is important to understand in this context that a FTT would be simply one component of the cost of trading. Investors also have to pay brokerage fees to the agents who actually put through the trade on their behalf. In addition, there is a bid-ask spread charged by the specialists who make the market in which they charge slightly more for selling a share of stock or other asset than they pay to buy it. This difference covers their costs, and their risk of holding an asset that is falling in price and will have to be sold for a lower price than they paid. The FTT is an addition to these other costs.

These other transaction costs will vary hugely depending on the parties involved. They would be highest for a small investor who trades on his own behalf. This investor would be paying large commissions on each purchase and sale in addition to the bid-ask spread to the specialty trader. The

2 See Table 3.

costs would be somewhat lower for an individual investor who holds their stock or other assets through a large mutual fund. In this case, the mutual fund will have likely negotiated quantity discounts with traders so that the commissions are a small percentage of the price of the assets being traded. A large pension fund will be in the same position. However, the lowest cost traders would be professionals that trade on their own behalf, like high-frequency traders. These trades do not go through a middle man and, therefore, do not have to pay the bid-ask spread margin.

These differences in trading costs are important, since a FTT will not have the same proportionate effect on trading costs for different actors in the market. A 0.1 percent tax may be 25 to 30 percent of the trading costs incurred by an individual with money in a mutual fund. It may be 70 to 80 percent of the trading costs of high-frequency traders who are trading on their own behalf. If the elasticity of trading is the same for all traders, then a FTT will have by far the largest effect on the trading volume of high frequency traders and a much smaller effect on the trading volume of individuals with money in a mutual fund.

While high frequency traders would almost certainly see the largest percentage drop in trading volume, it is not necessarily true that elasticities are the same for all traders. Typically the elasticity of an item declines as its price declines. When a product like a smart phone or flat screen television is expensive, a 20 percent drop in price is likely to lead to a larger percentage increase in sales than when the price is already low. For example, when flat screen televisions fell in price from $2,000 to $1,600 (a 20 percent decline), there was likely a large *percentage* increase in sales, since sales would have been small at such high prices. Currently, if the price of lower end flat screen televisions were to fall from $400 to $320, the percentage increase in flat screen sales is not likely to be very large. There are already many flat screen televisions being sold, so even a large increase in absolute numbers would not be a large percentage increase.[3]

If we try to apply the same logic to trading, it is reasonable to believe that the elasticity of trading volume is actually greater with less frequent traders who face higher trading costs. For these traders, the tax will be a smaller percentage of their trading costs, but it could lead to a more than proportionate reduction in their trading volume. If a tax of 0.1 percent on a stock trade raised trading costs by a third, and if average turnover of stock fell from once every two years (50 percent

3 One of the positive aspects of an FTT is it will have the least impact on the trading volume of relatively illiquid assets, since it will be a smaller share of their current trading costs. In the case of a widely traded stock, like shares of GE, a 0.1 percent tax will be a substantial percentage of current trading cost. However a smaller company whose stock is typically only traded in small volumes will have a large bid-ask spread. In this case, a 0.1 percent tax would be a relatively small share of current trading costs and therefor have a limited effect on trading volume.

annually) to once every 32 months (37.5 percent annually), then the decline in trading volume would completely offset the higher cost per trade.[4]

As a practical matter, we don't have estimates on elasticities of trading volumes for different groups of traders, but there is no *a priori* reason for assuming that the elasticity for less frequent traders will be lower than the average for the market as a whole. **Table 3** shows estimates of elasticities from a series of studies that were cited in a recent International Monetary Fund (IMF) paper.

TABLE 3

Estimated Elasticities of Trading Volume with Respect to Transaction Costs

Source	Country	Market	Elasticity	Measure
Baltagi et al. (2006)	China	Stock market	-1	TTC
	China	Stock market	-0.5	STT
Chou and Wang (2006)	Taiwan	Futures market	-1	STT
	Taiwan	Futures market	-0.6 to -0.8	BAS
Ericsson and Lindgren (1992)	Multinational	Stock markets	-1.2 to -1.5	TTC
Hu (1998)	Multinational	Stock markets	0	STT
Jackson and O'Donnell (1985)	UK	Stock market	-0.5 (-1.7)*	TTC
Lindgren and Westlund (1990)	Sweden	Stock market	-0.9 to -1.4	TTC
Schmidt (2007)	Multinational	Foreign exchange	-0.4	BAS
Wang et al. (1997)	United States	S&P 500 Index Futures (CME)	-2	BAS
	United States	T-bond futures (CBT)	-1.2	BAS
	United States	DM futures (CME)	-2.7	BAS
	United States	Wheat futures (CBT)	-0.1	BAS
	United States	Soybean futures (CBT)	-0.2	BAS
	United States	Copper futures (COMEX)	-2.3	BAS
	United States	Gold Futures (Comex)	-2.6	BAS
Wang and Yau (2000)	United States	S&P 500 Index Futures (CME)	-0.8 (-1.23)*	BAS
	United States	DM futures (CME)	-1.3 (2.1)	BAS
	United States	Silver futures (CME)	-0.9 (1.6)	BAS
	United States	Gold futures (CME)	-1.3 (1.9)	BAS

*Long-run elasticities in parentheses

TTC = Total Transaction Costs
STT= Security Transaction Tax
BAS = Bid-Ask Spread

Source and notes: From Matheson (2011), Table 5.

In terms of overall elasticities, most of the studies find evidence that the elasticity of trading volume is greater than an absolute value of one. Based on this set of studies, the Tax Policy Center used -1.5 as its central estimate of elasticity in calculating the incidence of the tax.[5] It is probably fair to

4 Actually, in this scenario the fall in trading volume would more than offset the increase in costs. The investor is trading 66.7 percent as much as before the tax, and paying 133.3 percent as much per trade. This would make total trading costs 88.7 percent as much as they had been previously.

5 Burman, Leonard E. et al. (2015).

conclude that most evidence points to the elasticity of trading as greater than one.[6] This means that in response to the tax, trading volume on average will decline by a larger percentage than the tax increases trading costs. In total, then, the amount that people spend on trading will decline, rather than increase, as a result of the tax. As noted above, this does not imply that everyone will see their trading costs decline, but if the elasticity is greater than one, then on average trading costs will decline. This means that the loss of income for the financial industry due to reduced trading volume will actually exceed the amount of money raised through the tax.

There is one other aspect to the measure of elasticity that is worth noting. Many financial products have the character of insurance. For example, a farmer selling a future against her crop is insuring that she will get a set price for her crop rather than taking the risk of what the market price will be when she actually has a crop to sell. Holders of corporate bonds may buy credit default swaps to protect against the risk that a company will go bankrupt.

While it is generally desirable to insure against risk, there are often instances where we opt to not have insurance if the price is too high. Many tourists going to the coast in the summer buy hurricane insurance. This insurance reimburses them for the cost of the trip if a hurricane forces them to leave early. This is a type of insurance that is desirable to have, but if it were expensive few people would buy it.

Similarly, financial products, like crop futures and credit default swaps, would be bought and sold in much smaller volumes if the cost were greater. For this reason, a FTT may not just reduce the volume of trading, but will also reduce the number of financial products actually created. There is some implicit cost in reducing the extent to which people insure themselves against bad outcomes, but presumably this cost is limited. The FTT is only raising the price of these forms of insurance, not making them unavailable. If the insurance provided by a futures contract or credit default swap had great value, then businesses or individuals would still buy them, even if the FTT had made them slightly more expensive.

Of course investors also speculate in these products, for example buying futures with the expectation that the price of a product will rise or buying credit default swaps with the expectation a company will go into bankruptcy. A FTT will certainly have the effect of reducing this sort of speculation, which will also have the effect of reducing the number of derivatives that are created.

6 It is worth noting in this respect that total trading costs have increased relative to the size of the economy for the last four decades even as the cost per trade has fallen sharply. This further supports the view that the elasticity of trading is greater than one.

The Volume of Trading and the Efficient Allocation of Capital

A FTT that raises any substantial amount of money will clearly lead to large reductions in trading volume. A key question is whether such a reduction in trading volume will be associated with a worse allocation of capital, and therefore slower growth and reduced output, or whether the reduction in volume will simply be eliminating useless trading. In the latter case, the trading is helping to allocate capital to its best uses. In the former case, the trading has little or nothing to with the best allocation of capital and could even lead to its misallocation.

In the latter case, we can think of the trading that will be eliminated as a result of a FTT as being comparable to having a lottery. The lottery itself does not generate anything productive for the economy; it simply redistributes money from the losers to the winners. If we tax the lottery, fewer people will play the lottery, but there is no loss to the economy from fewer lottery tickets being sold. (This assumes people only care about winning the lottery and don't enjoy the process of playing the lottery.)

If a large percentage of current financial transactions is like the lottery, then eliminating them will not impair the operation of the economy. This means that the only costs associated with the tax would be the money that investors have to pay, net of their reduction in other trading costs. On the other hand, if the trading is important to the proper allocation of capital, then reducing it will have the effect of lowering growth and GDP. There are good reasons for believing the waste view.

There has been some research in the last few years which found that a large financial sector was associated with slower economic growth. A 2012 study by Stephan Cecchetti and Enisse Kharroubi, two researchers at the Bank of International Settlements (BIS), analyzed the link between growth and the size of the financial sector across 50 wealthy and developing countries.[7] It found that a larger financial sector seems to foster growth up to a certain point. After achieving an optimal size relative to the size of the economy, the financial sector acted as drag on growth when it grew larger.

7 Cecchetti and Kharroubi (2012).

The study looked at industry level data from a smaller sample of wealthy countries. It found that industries that were the most dependent on external financing and that were heaviest in research and development spending were the ones that were most likely to experience slower productivity growth in countries with rapidly growing financial sectors.

There is a plausible explanation for this pattern. In the first case, if a bloated financial sector is pulling away capital that could otherwise have gone to productive investment, then it makes sense that the most affected sectors would be the ones that need external financing. The companies that can generate all the money they need for investment from their own profits may not be hurt much by an over-sized financial sector.

In the case of research and development intensive industries, the financial sector should be viewed as a competitor for talent. If there are a lot of high paying jobs for people with good math and technical skills in finance, then they are less likely to be working in designing software.

Following Cecchetti and Kharroubi, the reduction of trading volume associated with a FTT would lessen the extent to which the financial sector was pulling away highly skilled individuals from productive sectors of the economy. If the ability of the financial sector to allocate capital effectively was not impaired by this reduction in trading volume, then the effect of the tax on growth would be positive.

A recent analysis by the IMF also found a similar relationship between the size of the financial sector and growth.[8] While a larger financial sector was associated with stronger growth in developing countries, a very large financial sector appeared to slow growth. In this analysis, a larger financial sector did not impede capital accumulation; rather, it was associated with lower multifactor productivity growth, implying that capital was not being directed to its best uses.

The idea that an overgrown financial sector can be a drag on growth is consistent with the analysis in Philippon (2014) which finds that the unit cost of intermediation has remained unchanged since 1900.[9] This result is counter-intuitive since it would be expected that enormous advances in computers and information technology would have led to a sharp reduction in the cost of intermediation. However, whatever savings have been realized as a result of improvements in technology appear to have been offset by an increase in the volume of services associated with intermediation. While these services may provide some value, it is not obvious what it would be.

8 Sahay et al. (2015).
9 Philippon (2014).

Finally, on a theoretical level, it is worth noting that growth models generally do not include a transaction cost term. In other words, most growth models assume that increased output depends on the amount and quality of labor and capital and the overall level of technology. They do not assume a speedup of growth associated with a decline in transactions costs. (Certainly it would be difficult to find evidence of any such speedup over the last four decades, as noted in the earlier discussion.) If there was not an expectation that a decline in transactions costs would lead to an acceleration of the rate of growth, then it is not obvious why we should expect an increase in transactions costs associated with a FTT to lead to slower growth.

In short, there is good reason to believe that the lottery model accurately captures much of the trading in U.S. financial markets. Traders are hoping to gain at each other's expense in a zero sum game. Reducing the resources devoted to this activity has little impact on the ability of the financial markets to effectively allocate capital. Instead it is likely to lead to a boost in growth by diverting resources from this zero sum game to productive sectors of the economy.

From this perspective, the incidence of the tax should simply be the actual change in trading expenses incurred by each income group. If anything, the shift of resources away from finance may imply a greater level of growth and income to be allocated among households.

Incidence of the Tax by Income Group

Table 4 assumes that there is no change to GDP as a result of the tax. It shows the incidence by income group assuming that trading volume is proportionate to the assets held. It shows a low elasticity scenario (-0.75), a middle elasticity scenario (-1.0), and a high elasticity scenario (-1.5). In each case, the calculations follow the Tax Policy Center analysis in assuming a 0.061 percent average transactions costs for assets subject to the tax.[10]

10 This transactions cost figure was obtained by calculating the transactions cost that would result in the decline in trading volume assumed in Table 4 for a tax of 0.1 percent. This calculation would be only an approximation since it constructs an average transactions cost for assets, when in fact there are large differences in the cost for different types of assets. The transactions costs for equities are almost an order of magnitude greater than the transactions costs for derivatives. The per family tax by quintile in the event of no change in trading was calculated by taking the Tax Policy Center's estimate for the revenue collected if there was not decline in trading volume ($214.3 billion) and dividing this by the number of families represented by the SCF (122.5 million). This gives an average tax of $1,749 per family. This was adjusted in accordance with the percentage of the average wealth held by a family in each income group relative to the overall average ($211,600).

TABLE 4

Average Cost of 0.1 Percent FTT by Income Percentile

(2013 dollars)

Percentile of Income	Low elasticity (-0.75)				Middle elasticity (-1.0)				High elasticity (-1.5)			
	Tax w/o change in volume	Percent reduction in volume	Implied reduction in other trading costs	Net change in trading costs	Tax w/o change in volume	Percent reduction in volume	Implied reduction in other trading costs	Net change in trading costs	Tax w/o change in volume	Percent reduction in volume	Implied reduction in other trading costs	Net change in trading costs
Less than 20	$106.8	51.7%	$33.7	$17.9	$106.8	62.1%	$40.5	$0.0	$106.8	74.6%	$48.6	-$21.5
20–39.9	$212.3	51.7%	$67.0	$35.6	$212.3	62.1%	$80.4	$0.0	$212.3	74.6%	$96.6	-$42.7
40–59.9	$488.1	51.7%	$153.9	$81.8	$488.1	62.1%	$184.9	$0.0	$488.1	74.6%	$222.1	-$98.1
60–79.9	$1,073.0	51.7%	$338.4	$179.9	$1,073.0	62.1%	$406.4	$0.0	$1,073.0	74.6%	$488.3	-$215.7
80–89.9	$2,274.5	51.7%	$717.3	$381.3	$2,274.5	62.1%	$861.6	$0.0	$2,274.5	74.6%	$1,035.1	-$457.3
90–100	$11,459.0	51.7%	$3,613.8	$1,920.9	$11,459.0	62.1%	$4,340.8	$0.0	$11,459.0	74.6%	$5,214.5	-$2,304.0

Source and notes: Federal Reserve Board (2013), Burman et al. (2015), and author's calculations.

As can be seen, only in the low elasticity scenario will investors on average pay any portion of the tax, after netting out their savings on other trading costs. By construction, in the middle scenario with an elasticity of -1, the decline in trading costs exactly offsets the amount of tax revenue paid, so that total trading costs are not changed by the tax. In the high elasticity scenario, the reduction in other trading costs exceed the revenue collected from the tax, which means that the financial sector will bear the full burden of the tax.[11]

Even in the low elasticity scenario, the impact for most households will be limited due to their relatively small asset holdings. For the bottom quintile, the average cost would be $17.90 a year. Even for the fourth quintile the cost would be on average just $179.90 per household. In short, the vast majority of households would see almost no burden from an FTT even in this low elasticity scenario. It is also worth noting that in this low elasticity scenario, the implied revenue from the tax is over $100 billion a year.

If the elasticity is higher, as most research indicates, their tax payments will be fully offset by a reduction in other trading costs. Using the elasticity assumption from Tax Policy Center's analysis, a family in the second quintile would see a decline in their annual trading costs of $43. A family in the fourth quintile would see a decline in their annual trading costs of $216. The sharpest reduction in trading costs would be for the highest income families, since they had been doing the most trading.

In short, if the elasticity of trading is greater than one (in absolute value) then the reduction in trading costs will exceed the amount of revenue raised through the tax. The financial sector will bear the full brunt of the tax in the form of less revenue from trading.[12] Whether or not there is a burden to the rest of the economy will depend on whether the lost trades affect the efficiency of the allocation of capital across the economy. If this is unaffected, then the revenue raised through the tax comes entirely at the expense of the financial sector.

11 The implied savings from lower transactions costs cannot be simply deducted from the base tax revenue to get the net cost to investors, since the tax revenue will be much lower after factoring in the drop in trading volume.

12 The calculations here may understate the losses to the financial sector since they assume that the full cost of the tax is passed on to investors. It is possible that reductions in trading volume of the size implied by these calculations could result in lower margins per trade, as financial intermediaries are forced to accept lower fees.

Conclusion

This paper examines the incidence of a financial transactions tax based on the holdings of financial assets by income group. It shows that the reduction in trading costs associated with reduced trading volume as a result of the tax will largely offset the cost of the tax even if trading is relatively inelastic. If trading is elastic, then the cost of the tax will be born in full by the financial industry in the form of reduced revenue. Whether or not there is any impact to the rest of the economy will depend on the extent to which the reduction in trading volume affects the efficiency of the allocation of capital. If the allocation of capital does become less efficient as a result of reduced trading volume then the financial industry will bear the full burden of the tax.

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