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## A COMPARISON OF TPC AND THE POLLIN, HEINTZ AND HERNDON REVENUE ESTIMATES FOR BERNIE SANDERS'S FINANCIAL TRANSACTION TAX PROPOSAL

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April 12, 2016

### ABSTRACT

Presidential candidate Bernie Sander proposed a financial transaction tax to finance universal access to higher education. TPC estimated that it would raise \$52 billion in its first year while Pollin, Heintz and Herndon estimated it would raise \$300 billion. This brief reconciles those differences. The Pollin, et al, estimate assumes a much larger volume of derivative transactions than appear to exist; they implicitly assume that transaction costs are much higher or elasticities much smaller than TPC; they account for offsetting changes in other tax revenues in a nonstandard way; and they account for a vaguely articulated individual tax credit, which TPC ignored.

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*The findings and conclusions contained within are those of the author and do not necessarily reflect positions or policies of the Tax Policy Center or its funders.*

Presidential candidate Senator Bernie Sanders has included as part of his tax plan the financial transaction tax (FTT) he proposed in S. 1371, the “Inclusive Prosperity Act of 2015,” introduced on May 19, 2015.

Urban-Brookings Tax Policy Center (TPC) revenue estimates for the Sanders FTT proposal<sup>1</sup> differ substantially from those prepared by Pollin, Heintz and Herndon (PHH).<sup>2</sup>

TPC estimates that had the Sanders FTT (and the rest of his tax plan) become effective in 2015, the FTT would have raised \$52 billion in that year; PHH’s estimate for 2015 is \$300 billion.

The \$248 billion difference between the TPC and PHH estimates is due to four factors:

1. Volume of financial transactions. TPC estimates that total U.S. financial transactions in 2015 were \$1,337 trillion; PHH that they were \$4,091 trillion more, or \$5,428 trillion. Nearly all of the difference is due to the method that PHH used to estimate derivatives, which appears to significantly overstate derivative volumes. Artificially high volumes inflated PHH’s static (before considering behavioral responses) estimate for Sanders FTT by \$189 billion over TPC’s static estimate of \$491 billion.
2. Behavioral response. Traders’ response to the tax depends on the current (pre-FTT) costs of transactions and how responsive they are to the change in costs due to the FTT. Using transaction costs and an elasticity of -1.25, both well supported in the literature on FTTs, TPC estimates that under the Sanders rates in 2015 the behavioral response of traders would reduce transactions in stocks by over 85%, in bonds by over 63%, and in derivatives by nearly 82%. PHH simply assumes that transactions (in all financial instruments) will decline by 50%. A decline of 50% implies that PHH is assuming baseline transactions costs that are far higher, or elasticities that are far lower, than our reading of the available evidence.
3. Offsets. Official revenue estimates of excise taxes prepared by the Joint Committee on Taxation (JCT) and Treasury include an “offset” for related declines in income and payroll tax revenues. That is, the excise tax reduces wages and profits, which translates into lower tax revenues. TPC includes this offset in its estimates, based on income and payroll tax rates under Sanders full tax plan; in 2015 this offset is \$32 billion. TPC also includes an offset for a decline in revenues from capital gains because the Sanders FTT rate of 0.5% on stock trades would cause investors to sell less and thus owe less capital gains tax. In 2015 this offset is \$29 billion. The total offsets in TPC’s estimates for the Sanders FTT in 2015 are therefore \$61 billion. PHH argue that excise offsets should themselves be offset by

revenue from additional government spending financed by FTT revenues; their net offset is \$20 billion, less than a third of TPC's.

4. Credit for individuals. The Sanders FTT proposal includes a credit for FTT paid by low- and moderate-income individuals. TPC's estimate does not include an amount for this credit because the legislative language in S. 1371 appears to be misdrafted and in any event is incomplete. PHH included an estimate of this credit of \$20 billion.

### SANDERS FTT PROPOSAL

The basic elements of S. 1371 are as follows:

- Rates are 0.5% on stock trades, 0.1% on bond trades, and 0.005% on derivative trades;
- The base includes sales of stock (except initial issues), bonds (except initial issues, tax-exempt state and local bonds, and debt instruments with a fixed maturity of 60 days or less that are traded in the U.S.), sales of partnerships and beneficial interests in partnerships and trusts, and commodity, currency and financial product derivatives (options, forwards, futures and swaps), where the trade occurs or is cleared in the U.S. or the purchaser or seller is a U.S. person;<sup>3</sup>
- The base for options is premiums, but for other derivatives is underlying notional values;<sup>4</sup>
- Low- and middle-income individuals would be allowed an income tax credit for the FTT they paid during the year; and
- The tax would be effective 1-1-16.

### TPC AND PHH REVENUE ESTIMATES

The TPC estimates cover fiscal years 2017 through 2036, with an assumed effective date of 1-1-17, and take into account the effects on FTT revenues of other elements of Sanders tax plan. The PHH estimates are for only one year, 2015, and do not take into account the other elements of Sanders's tax plan. In order to provide a direct comparison with the PHH estimates, TPC has prepared an estimate for the Sanders FTT as if it (and the other elements of his full tax plan) went into effect in 2015.<sup>5</sup> Table 1 provides a comparison of the two sets of estimates.

**TABLE 1**

## Comparison of TPC and PHH Revenue Estimate for Senator Sanders FTT

Billions of dollars, 2015



	TPC	PHH	Difference
Static (no behavior) revenue	491	680	-189
Less: effect of behavioral response	-378	-340	-38
Equals: dynamic (with behavior) revenue	113	340	-227
Less: offsets	-61	-20	-41
Less: credit for individuals	*	-20	-20
<b>Equals: revenue estimate</b>	<b>52</b>	<b>300</b>	<b>-248</b>

**Source:** Author's calculations: Pollin, Heintz, and Herndon (2016)

\* TPC's estimate does not include an amount for the credit because the legislative language in S. 1371 appears to be misdrafted and incomplete; see discussion below.

TPC's revenue estimate is about one-sixth of the PHH estimate due to significant differences in every component of the estimate. We examine each of these differences to determine how they arise.

### STATIC (NO BEHAVIOR) REVENUE

PHH provide information on the stock, bond and derivatives transactions volume in 2015 that they use in their estimates. These volumes and the corresponding volumes used by TPC are shown in Table 2.

**TABLE 2**

## Comparison of TPC and PHH Transactions Volumes

Trillions of dollars, 2015



	TPC	PHH	Difference
Stocks	51	48	3
Bonds	182	180	2
Derivatives	1,104	5,200	-4,096
Total	1,337	5,428	-4,091

**Source:** Author's calculations: Pollin, Heintz, and Herndon (2016)

TPC's transactions volumes for stocks and bonds are slightly larger than PHH's. With tax rates of 0.5% on stocks and 0.1% on bonds, these differences alone would make TPC's static

revenue estimate higher than PHH's by  $0.5\% \times \$3 \text{ trillion} + 0.1\% \times \$2 \text{ trillion} = \$17 \text{ billion}$ . But for derivatives, the PHH volume is larger than TPC's by nearly  $\$4.1 \text{ quadrillion}$ . The Sanders tax rate on derivatives is 0.005%, so the difference in derivative volumes accounts for virtually all of the difference in static revenues ( $0.005\% \times \$4,096 \text{ trillion} = \$205 \text{ billion}$ ).<sup>6</sup>

Why is there such a large difference in the TPC and PHH estimates for derivatives? Both TPC and PHH obtain basic data on derivatives from the same source, the Bank for International Settlements (BIS), but they derive the transactions data necessary for revenue estimates from the BIS data in very different ways. The basic BIS data covers two markets for derivative sales, organized exchanges and over the counter (OTC), and two types of data, the notional value at a particular point in time (e.g., the end of a year) of derivatives' underlying financial assets, and the average amount of turnover (sales) of derivatives, again valued at the notional value of the underlying financial assets. For organized exchanges, both types of data are available on an annual (or more frequent) basis, but for OTC markets only notional values are available every year, with turnover available only every three years.<sup>7</sup>

TPC uses the triennial BIS data on turnover of derivatives in OTC markets and BIS annual data on notional amounts outstanding of derivatives in OTC markets to estimate turnover in intervening years. These actual and estimated OTC turnover amounts are then added to the annual BIS turnover amounts on organized exchanges<sup>8</sup> to arrive at total derivative turnover in the U.S. In addition, the Sanders FTT base for options is the premiums paid for writing the option, rather than the notional values of the underlying financial assets, so TPC adjusts the options data to represent premiums.<sup>9,10</sup>

PHH also uses the BIS data on turnover of derivatives on organized exchanges. But rather than using the available BIS data on turnover of derivatives in OTC markets, it simply assumes that the ratio of turnover to notional amounts outstanding in OTC markets is half the ratio for organized exchanges, and uses that assumption to estimate turnover in OTC markets.<sup>11</sup> However, rather than being 50%, as assumed by PHH, the actual fractions of OTC to organized exchange ratios computed from BIS data are only 4.1% for interest rate futures or forwards and 2.5% for foreign exchange (FX) futures or forwards and swaps. So the PHH shortcut method of estimating OTC derivative turnover vastly overstates that turnover (by factors of over 10 times for interest rate derivatives and 20 times for FX derivatives). Further, the notional amounts outstanding in OTC markets is very large relative to notional amounts outstanding on organized exchanges, so this overstatement of turnover is magnified, which accounts for PHH's derivative transaction volume being so much larger than TPC's.

## EFFECT OF BEHAVIORAL RESPONSE

The behavioral response of traders to an FTT depends on how large the tax is relative to the current transaction cost of a particular transaction, and how responsive traders are to the change in those costs due to the FTT. To estimate behavioral responses, TPC uses transaction costs estimates from the economics literature, verified where possible by several sources.<sup>12</sup> We assume that transaction costs will continue to decline in the future at a rate of about 2.3% per year, a slower rate than they have declined in the past. Likewise, TPC uses measures of traders' responsiveness (price elasticities) from several sources in the economics literature. Although the elasticity estimates in the literature vary widely, based on the most relevant estimates we believe a reasonable range of elasticities for financial transactions in the U.S. is -1 to -1.5, and use the midpoint of this range, -1.25, as our standard elasticity for revenue estimates. (Burman, et al, 2016 shows the sensitivity of estimates to higher or lower elasticity estimates.) TPC's transaction costs estimates are included in Table 3, which shows the percentage change in transaction volume for stocks, bonds and derivatives under Sanders proposed FTT rates. The declines in transactions are very large – over 85% for stocks, over 82% for derivatives, and nearly 63% for bonds – because the Sanders tax rates would represent a significant increase in transaction costs.

**TABLE 3**

### Percentage Change in Transactions Volumes under Sanders FTT Rates<sup>a</sup> 2015



	Stocks	Bonds	Derivatives*
Transaction costs	0.1393%	0.0827%	0.0017%
Sanders tax rate	0.5000%	0.1000%	0.0050%
Percentage change in costs	78.2%	54.7%	74.9%
<b>Percentage change in transactions</b>	<b>-85.1%</b>	<b>-62.9%</b>	<b>-82.2%</b>

**Source:** Author's calculations

<sup>a</sup> Using TPC's estimates of transactions costs and standard elasticity of -1.25

\* TPC uses different transaction costs for each type of derivative in making its estimates rather than the weighted average shown here. The actual reduction in transactions is 86.0%, somewhat higher than the 82.2% shown here.

PHH discuss transaction costs and elasticities at some length, but rather than making explicit estimates of these behavioral parameters they simply assume that under the Sanders FTT rates transaction volumes (for all financial instruments) would decline by 50%. This reduction in transaction volumes implies that PHH is assuming baseline transaction costs that are much higher or elasticities that are much lower than TPC. We have calculated the implied

transaction costs required for a reduction of 50% in transaction volume if PHH used the same elasticity as TPC (-1.25), and alternatively the implied elasticities required for a reduction of 50% in transaction volume if PHH used the same transaction costs as TPC. The results of these calculations are shown in Table 4.

**TABLE 4**

**Implied PHH Transaction Costs and Elasticities<sup>a</sup>  
2015**



	Stocks	Bonds	Derivatives
Implied PHH transaction costs			
Sanders tax rate	0.5000%	0.1000%	0.0050%
PHH's assumed percentage change in transactions	-50.0%	-50.0%	-50.0%
<b>Implied PHH transaction costs</b>	<b>0.5873%</b>	<b>0.1175%</b>	<b>0.0059%</b>
Implied PHH elasticities			
TPC's 2015 transaction costs	0.1393%	0.0827%	0.0017%
Sanders tax rate	0.5000%	0.1000%	0.0050%
Percentage change in costs	78.2%	54.7%	74.9%
<b>Implied PHH elasticities</b>	<b>-0.45</b>	<b>-0.87</b>	<b>-0.50</b>

**Source:** Author's calculations

<sup>a</sup> Implied transaction costs using TPC's -1.25 elasticities and implied elasticities using TPC's 2015 transaction costs to estimate PHH's assumed 50 percent reduction in transactions under Sanders FTT rates.

The implied PHH transaction costs in the first bank of Table 4 are much higher than TPC's 2015 transaction costs shown in the second bank (and in Table 3); over 4 times as high for stocks, nearly 3.5 times for derivatives, and over 1.4 times as high for bonds. Alternatively, the implied PHH elasticities are implausibly low, and much lower than TPC's -1.25; well less than half for both stocks and derivatives, and a little over two-thirds for bonds. We don't read the available evidence to support either the high implied PHH transaction costs or the low implied PHH elasticities.

**OFFSETS**

Any excise tax creates a "wedge" between the prices paid by purchasers and the price received by sellers, so causes a reduction in wages and profits if the price level is unchanged (the standard assumption made by the Joint Committee on Taxation and Treasury in making official revenue estimates). Wages and profits are the base for income and payroll taxes, so a reduction in wages and profits will cause a reduction in federal tax revenues from the individual income, corporate income, and payroll taxes. TPC's revenue estimates for excises follow the procedures used by



JCT and Treasury, taking into account these reductions in federal income tax and payroll tax revenues (the excise tax “offsets”). For the Sanders FTT, TPC calculated these offsets using the higher individual income and payroll tax rates under Sanders full tax plan. These excise offsets grow over time, but would be 28.4% in the initial year of the plan.<sup>13</sup> Applied to the dynamic revenue estimate of \$113 billion shown in Table 1, the excise tax offset in 2015 would be a reduction in revenue of \$32 billion.

Gross revenues from an FTT would also be reduced (offset) because the FTT would increase the cost of selling assets, which would reduce capital gains realizations and associated individual income tax revenues. TPC has estimated this capital gains offset for the Sanders rate on stocks of 0.5% and using the rates on capital gains under Sanders full tax plan, assuming an effective date of 1-1-17. These estimates assume taxpayers would shift some realizations to 2016 (to avoid the higher taxes), so here we combine the estimates for 2016 and 2017 and deflate them for GDP growth to estimate the capital gains offset for 2015. This offset is a reduction in revenue of \$29 billion, making the total 2015 offsets \$61 billion (as shown in Table 1).

PHH acknowledge the reasons for taking into account the excise tax offset, but then argue that the revenue estimate should also take into account the offsetting gains in revenue if FTT revenues are used to finance higher spending. They calculate a net amount of offset based on assumptions about the amount of wages lost in the financial industry and the gain in employment and wages if the new spending was for education. While there is merit in considering the combined effects of revenues and spending on the economy, in doing so the effects of the spending should not be attributed to the tax (or vice versa). Further, their analysis fails to take into account the general equilibrium effects of an excise, which would change wages and profits (and the employment of labor and capital) in all industries, not just the taxed industry. Similarly, they do not consider the full effects of new spending. So even if macroeconomic effects were being taken into account, it is not clear that raising revenue from an FTT and spending it on education would lead to higher aggregate employment, as PHH’s estimates assume. In any event, their estimate does not conform to the standard procedures followed by the JCT (and Treasury) in preparing official revenue estimates. PHH’s (net) offset is a reduction in revenues of \$20 billion, or less than a third of TPC’s offsets.

## **CREDIT FOR INDIVIDUALS**

A provision of the Sanders FTT bill would allow individuals with modified AGI below \$50,000 (\$75,000 for joint filers) an income tax credit for “an amount equal to the tax [FTT] paid” by the individual during the year. TPC did not include this credit in its estimates, in part because the credit appears to be misdrafted (individuals generally do not remit the FTT; it is remitted by

exchanges or brokers) and is unclear (for example, would tax paid on transactions through an individual's IRA or 401(k) qualify for the credit and, if so, how?). PHH included what they term a "high-end estimate of revenues foregone from this provision"<sup>14</sup> of \$20 billion. This difference in methodology reduces the disparity between our estimates.

## NOTES

<sup>1</sup> Frank Sammartino, Len Burman, Jim Nunns, Joseph Rosenberg, and Jeff Rohaly, “An Analysis of Senator Bernie Sanders’s Tax Proposals” Urban-Brookings Tax Policy Center, March 4, 2016. TPC’s analysis of the financial transaction tax, including revenue estimating and distributional methodology, is described in Leonard E. Burman, William G. Gale, Sarah Gault, Bryan Kim, Jim Nunns, and Steve Rosenthal, “Financial Transaction Taxes in Theory and Practice,” *National Tax Journal*, March 2016, 69 (1): 171–216.

<sup>2</sup> Robert Pollin, James Heintz and Thomas Herndon, “The Revenue Potential of a Financial Transaction Tax for U.S. Financial Markets” Political Economy Research Institute, University of Massachusetts Amherst, Working Paper Series Number 414, March 2016.

<sup>3</sup> TPC does not include sales of partnerships and beneficial interests in partnerships and trusts in its FTT transactions base, due to lack of data, or sales of commodity derivatives, which available data indicate are very small. TPC also did not adjust bond sales to exclude debt instruments with a fixed maturity of 60 days or less due to lack of data. We do not think these omissions from, and the over-inclusion in, the transaction base materially affect our estimates. Note that the transaction base used by PHH appears to have the same omissions and over-inclusion.

<sup>4</sup> An apparent drafting error seems to indicate that the base for other derivatives is payments made rather than the notional value of the underlying financial instruments, which both TPC and PHH use in their estimates.

<sup>5</sup> This estimate reflects actual trading volumes for 2015, which weren’t fully available when TPC prepared its estimates for Sanders’s tax proposals, and some refinements to our estimating methodology. Neither the updated transaction data nor the refinements to our methodology significantly impact our revenue estimates.

<sup>6</sup> The net difference in static estimates computed here is  $+\$17 \text{ billion} - \$205 \text{ billion} = -\$188 \text{ billion}$ , which differs from the  $-\$189 \text{ billion}$  shown in Table 1 due to rounding.

<sup>7</sup> BIS gathers this turnover data as part of its triennial Central Bank Survey; the latest survey was for 2013. OTC data is available by country, but organized exchange data is only available by region (so U.S. amounts have to be estimated from the data for North America).

<sup>8</sup> As noted in the preceding footnote, the U.S. data for organized exchanges has to be estimated from the North America region. TPC assumes the U.S. represents 95% of the amounts for the region, while PHH assume the U.S. represents only 90%. This difference by itself makes TPC’s estimates somewhat larger than PHH’s.

<sup>9</sup> These adjustments are necessarily rough. The basic approach is to use BIS data to compute the average notional value per options contract sold, and to then compute a fraction of that notional value that would yield the average option premium computed from trades reported by the Options Clearing Corporation. (These premiums averaged \$289 for 2014 and 2015.)

<sup>10</sup> Previously, TPC estimated derivative transactions volume following the procedures described in Dean Baker, Robert Pollin, Travis McArthur and Matt Sherman, “The Potential Revenue from Financial Transactions Taxes,” Center of Economic and Policy Research, Political Economy Research Institute, University of Massachusetts Amherst, Issue Brief, December 2009. These procedures lead to a substantial underestimate of derivative transaction volume, but because of a low tax rate and large behavioral response for derivatives, that understatement had little effect on TPC’s prior estimates for the Sanders FTT.

<sup>11</sup> See their Appendix 1, pages 36–37.

<sup>12</sup> We primarily use estimates from Stephan Schulmeister, Margit Schratzenstaller-Altzinger and Oliver Picek, “A General Financial Transaction Tax: Motives, Revenues, Feasibility and Effects,” *Österreichisches Institut Für Wirtschaftsforschung*, March 2008 and Thornton Matheson, “Taxing Financial Transactions: Issues and Evidence,” International Monetary Fund, IMF Working Paper WP/11/54, March 2011. Data reported in PHH corroborate a number of these estimates.

<sup>13</sup> Because TPC has not estimated the full Sanders plan as if it went into effect in 2015, here we use the offset calculated for the initial year (2017) used in our prior estimates of the full plan.

<sup>14</sup> Page 34.



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