ESTIMATING TAXPAYER BUNCHING RESPONSES TO THE PREFERENTIAL CAPITAL GAINS TAX RATE THRESHOLD

Prepared by the Staff
of the
JOINT COMMITTEE ON TAXATION

September 10, 2019
JCX-42-2019

CONTENTS

OVERVIEW

One of the responsibilities of the staff of the Joint Committee on Taxation ("Joint Committee staff") is to provide Congress with estimates of the revenue effects of proposed tax legislation. Providing Congress with the estimated revenue effect of proposed legislation begins with an economic analysis of the proposal.

The net gain from a capital asset sale is generally taxable under the Internal Revenue Code. The timing and magnitude of such capital gains realizations is often at the taxpayer's discretion. Generally, capital gains on assets held for one year or less are subject to higher, short-term, ordinary income tax rates, while gains from assets held for more than one year are subject to lower, preferential, long-term capital gains rates. Understanding the extent to which the one-year threshold for short-term and long-term tax rates affects taxpayer's decisions to realize gain or loss, and how business cycle fluctuations may affect taxpayer's decisions, is important for modeling the revenue effects of policies related to capital gains income.

This document[1] summarizes recent work by the Joint Committee staff to better understand and quantify taxpayer responses to differing tax rates on capital gains as well as the effect of business cycles on those responses.[2] The Joint Committee staff uses the discontinuous change in tax rates, referred to in economics as a "notch," after an asset has been held for one year to estimate taxpayer responsiveness to changes in tax rates. The document describes the law and tax rate schedules applicable to income from the sale of capital assets and briefly reviews the findings from economic research on taxpayer behavior with respect to changes in capital gains tax rates. This document also provides a summary of the methods used by the Joint Committee Staff to investigate the effects of the one-year holding period on taxpayer behavior, including an approach to study the effects of the business cycle on taxpayer behavior. Finally, the document presents the results of the application of these methods, with a discussion of the implications of this research for Joint Committee staff revenue estimates.

---

[1] This document may be cited as follows: Joint Committee on Taxation, *Estimating Taxpayer Bunching Responses to the Preferential Capital Gains Tax Rate Threshold* (JCX-42-19), September 10, 2019. This document is available on the Joint Committee on Taxation website at www.jct.gov.

[2] The staff of the Joint Committee on Taxation welcomes comments from interested readers who have studied modeling of the Federal individual income tax. Direct comments to Chief of Staff, Thomas A. Barthold, and Deputy Chief of Staff, Robert P. Harvey, Joint Committee on Taxation, 502 Ford House Office Building, Washington, D.C. 20515-6453.

I. BACKGROUND ON CAPITAL GAINS TAXATION

A. Taxation of Income from the Sale of Capital Assets

Generally, income from the appreciation of capital assets is taxed at the time of sale, or realization. If capital assets are held for one year or less, gains are considered to be short-term gains and are taxed as ordinary income. If the assets are held for more than one year before sale, gains are considered to be long-term capital gains and are taxed at lower, preferential tax rates.

The preferential tax treatment of long-term gains is illustrated in Table 1. This table displays the applicable statutory tax rates for ordinary income and the preferential rate on long-term gains, effective in tax year 2019.[3] At the top of the income distribution, single taxpayers with taxable income in excess of $510,300 ($612,350 for joint filers) face a 17 percentage point difference in the tax treatment for short-term capital gains and long-term capital gains. Additionally, since tax year 2013, taxpayers with adjusted gross income in excess of $200,000 ($250,000 for joint filers) have a 3.8 percentage point surtax applied to net investment income, which includes capital gains income. Therefore, the top marginal tax rate for capital gains treated as ordinary income is 40.8 percent (= 37 + 3.8), and the top marginal tax rate for long-term capital gains is 23.8 (= 20 + 3.8).[4]

Table 1.–Ordinary and Preferential Statutory Tax Rates, 2019

Single Filer Taxable Income Threshold (Dollars)	Joint Filer Taxable Income Threshold (Dollars)	Ordinary Income Statutory Tax Rate (Percent)	Long-Term Capital Gains Tax Rate (Percent)
0	0	10	0
9,700	19,400	12	0
39,375	78,750	12	15
39,475	78,950	22	15
84,200	168,400	24	15
160,725	321,450	32	15
204,100	408,200	35	15
434,550	488,850	35	20
510,300	612,350	37	20

[3] There are seven ordinary brackets and three preferential capital gains brackets. Since the passage of Public Law 115-97 in December 2017, the thresholds for the preferential capital gains brackets do not conform to the brackets for ordinary income. Consequently, Table 1 shows two thresholds in addition to the ordinary income thresholds; one for the 15-percent preferential rate and one for the 20-percent preferential rate. Also as a result of the non-conformity, there is a $100 range of income ($200 for joint filers) over which the long-term capital gains rate is at 15 percent while the ordinary rate is at 12 percent.

[4] This research focuses on the capital gains subject to the preferential marginal rates as described in Table 1. In certain cases, long-term gains may be subject to higher rates, such as gains from the sale of collectibles, unrecaptured section 1250 gain, and gains attributable to depreciation recapture and treated as ordinary income.

Taxable capital gains may be offset by capital losses realized in the same year. The determination of how losses offset gains is made through a netting process. Losses are subtracted from gains of the same type: short-term losses are subtracted from short-term gains and long-term losses are subtracted from long-term gains. If the taxpayer has a net short-term loss, that loss is subtracted from net long-term gains. If the taxpayer has a net long-term loss, it is subtracted from net short-term gains. If overall net losses exceed net gains, up to $3,000 of losses can be used to offset ordinary income. Remaining net short-term losses can be carried over into the following year to offset future short-term gains. Similarly, net long-term losses can be carried over into the following year to offset future long-term gains.

B. Background on Capital Gains Realizations

The revenue generated from the taxation of capital gains is highly dependent on the rate at which such gains are taxed, partly because the timing and amount of capital gains is at the taxpayer's discretion. There is an established body of academic research investigating taxpayer responsiveness to changes in these tax rates. Responsiveness is summarized by the tax elasticity of capital gains realizations.[5] Efforts to estimate this elasticity typically break taxpayers' behavioral responses into two categories: permanent responses to the change in the tax rate, and immediate, temporary responses to anticipated tax rate changes. Recent estimates of these two elasticities suggest that the permanent elasticity is approximately negative 0.7 (indicating that an increase in the capital gains tax rate of 10 percent would result in a reduction of capital gains income of seven percent), and the transitory elasticity is in excess of 1.0 in absolute value. [6]

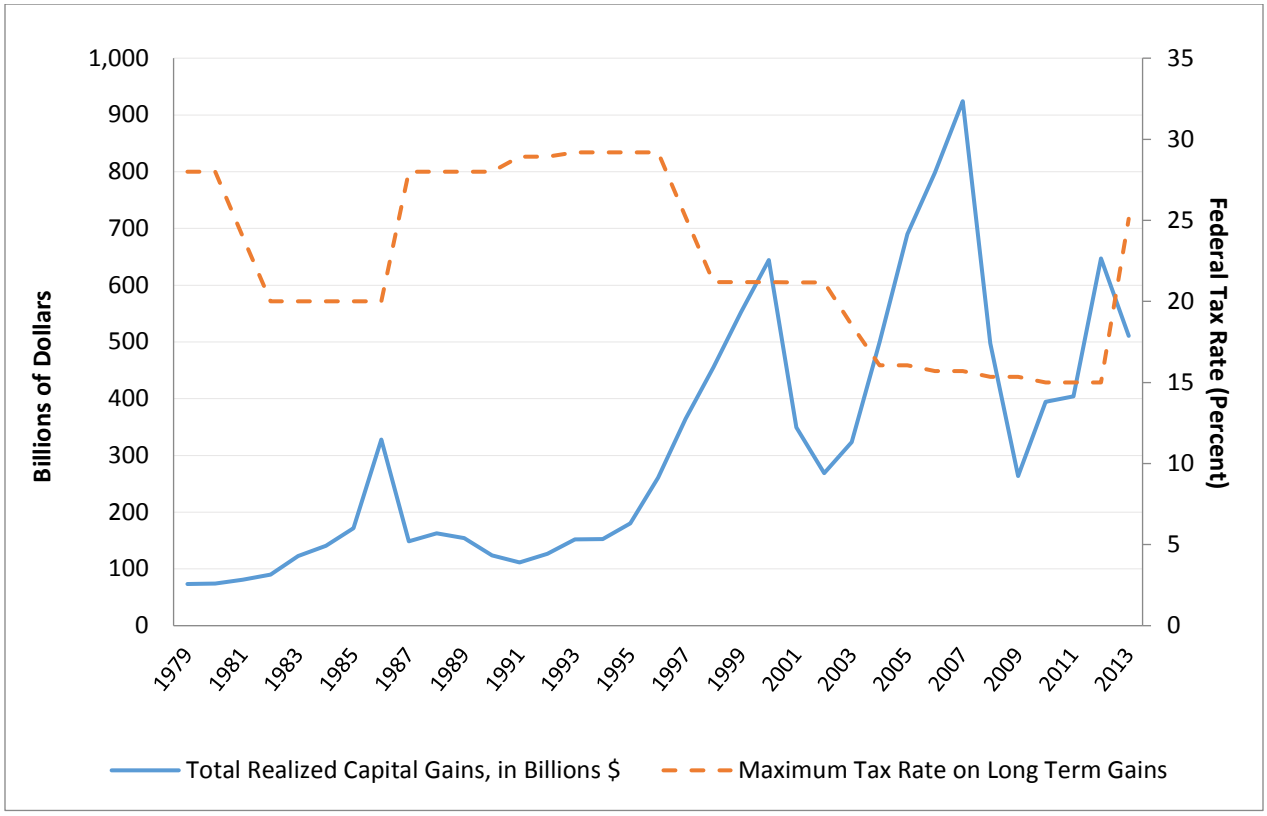
Figure 1 is useful for thinking about permanent and temporary responses to capital gains tax changes. This figure shows capital gains realizations over the period from 1979 to 2013 (the solid line corresponding with the left vertical axis), and the maximum statutory tax rate on long-term gains (the dashed line corresponding with the right vertical axis). The figure shows four periods for which the taxpayers substantially increased capital gains realizations. Two of these periods were clearly tax-motivated.

First, the Tax Reform Act of 1986 increased the top tax rate applied to long-term capital gains from 20 percent to 28 percent beginning in 1987. This contributed to an almost doubling in capital gains realizations from 1985 to 1986 as taxpayers realized gains in 1986 to avoid the anticipated increase in the capital gains tax rate for 1987 and beyond. This unlocking of realizations — taxpayers choosing to realize long-standing unrealized capital gains — in 1986 is a clear example of transitory responses to U.S. Federal tax policy changes. Once taxpayers knew that the tax rate in the future was going to be persistently higher, they viewed the current tax rate as temporarily lower and responded with significant realizations. The second transitory event can be seen with the spike in realizations in 2012. The American Taxpayer Relief Act of 2012 raised capital gains taxes from a top tax rate on long-term gains of 15 percent to 23.8 percent, which includes a 3.8 percent net investment income tax. Similar to the response in 1986 preceding the rate increase in 1987, taxpayers anticipated this increase and realized gains in 2012 ahead of the rate increase in 2013. The sizes of the spikes are due both to the magnitude of the change in tax rates and to the amount of unrealized gains that had accumulated over prior years.

[5] The tax elasticity of capital gains realizations measures the percentage change in realizations due to a percentage change in the tax rate.

[6] See Tim Dowd, Robert McClelland, and Athiphat Muthitacharoen, "New Evidence on the Tax Elasticity of Capital Gains," *National Tax Journal*, vol. 68, no. 3, September, 2015, pp. 511-544, and Saez, Emanuel, "Taxing the Rich More: Preliminary Evidence from the 2013 Tax Increase," *Tax Policy and the Economy*, vol. 31, no. 1, 2017, pp.71–120, and Gerald Auten, David Splinter, and Susan Nelson, "Reactions of High-Income Taxpayers to Major Tax Legislation," *National Tax Journal*, vol. 69, no. 4, December, 2016, pp. 935–964.

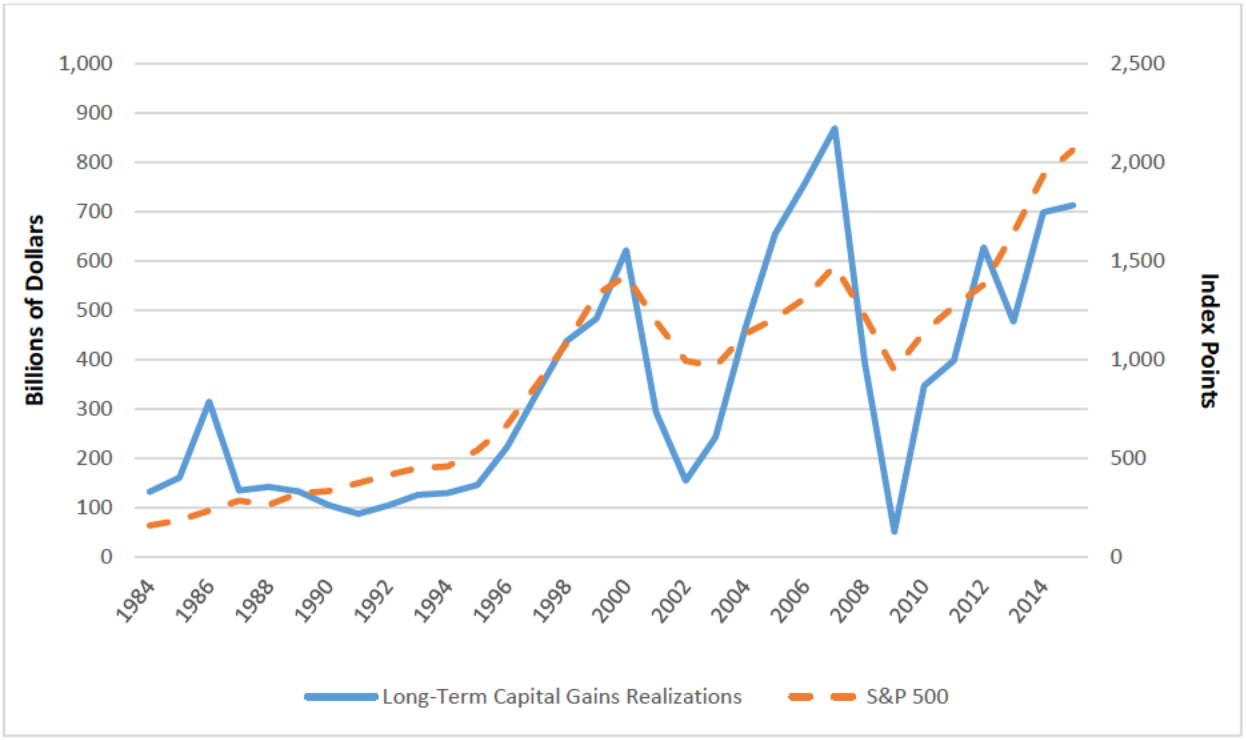
Figure 1.–Realized Capital Gains and Federal Tax Rates, 1979-2013



Note: Total realized capital gains are displayed in nominal dollars.

Of course taxes are not the only driver of capital gains realizations. Figure 1 also shows an increase in capital gains realization in the period from 1996 to 2000 and from 2003 to 2007. Figure 2, which shows long-term capital gains realizations and overlays the level of the S&P 500 index, a proxy for the business cycle, suggests this was due to the business cycle. Realizations responded positively to the upturn in the economy during the 1990s and collapsed as the S&P 500 index fell during the 2001 recession. Similarly, there was a surge in realizations from 2003 to 2007 as the economy heated up, and a collapse in realizations in 2008 and 2009 as the S&P 500 fell by 36 percent from 2007 to 2009.

Figure 2.–Realized Capital Gains and the S&P 500 Index



Note: Total realized capital gains are displayed in nominal dollars.

II. RESEARCH DESIGN FOR ESTIMATING RESPONSIVENESS TO CAPITAL GAINS TAXES

As seen in Table 1 there is a considerable tax advantage to holding a capital asset for one-year and one day rather than realizing the capital gain just short of the one-year holding period. The Joint Committee staff uses this cliff, or "notch," in the marginal tax rate schedule to estimate the temporary, short-run tax elasticity of capital gains.[7] The Joint Committee staff compares the increase in the amount of realizations just after the one-year holding period with a counterfactual estimate of the pattern of realizations, *i.e.*, an estimate of the pattern of realizations absent the preferential rate for long-term capital gains (Figure 3 displays both the observed and counterfactual distribution of realizations by holding period week in 2012).[8] This comparison does not depend on the amount of unrealized gains in prior years.

To measure taxpayer responses to the tax rate differential between short and long-term gains, Joint Committee staff uses a random sample of transaction-level capital asset sales recorded on Schedule D of Form 1040. These data include the basis of the asset, date of purchase, and date of sale. The Joint Committee staff then analyzes sales by the number of weeks the asset was held prior to sale, relative to holding the asset for 52 weeks. If taxpayers are sensitive to the tax rate change and take advantage of the lower tax rates on long-term capital gains, there should be fewer sales just prior to the one-year mark, and more sales just after the one-year mark.

The primary statistical exercise necessary to estimate taxpayer responsiveness to the notch is estimating capital asset sales patterns in the absence of a change in tax rates at the one-year holding period. The Joint Committee staff uses an econometric method analyzing the bunching pattern of capital gains just after the one-year holding period to estimate a counterfactual realization pattern. Then the observed holding patterns can be compared with the counterfactual, and the difference between the two is inferred to be caused by taxpayers responding to the change in tax rates. From this inference, the Joint Committee staff is able to calculate the tax elasticity of capital gains.

The counterfactual is estimated using the pattern of asset sales — by weeks held — sufficiently far from the one-year threshold so that they are not affected. In practice, this means using the pattern of sales for assets held, for instance, through the first 42 weeks prior to the one-year threshold, and after eight weeks (up to one year) following the one-year threshold. Based

---

[7] A detailed description of the methodology and results is available in Tim Dowd and Robert McClelland "The Bunching of Capital Gains Realizations," *National Tax Journal*, vol. 72, no. 2, June, 2019, pp. 323-357.

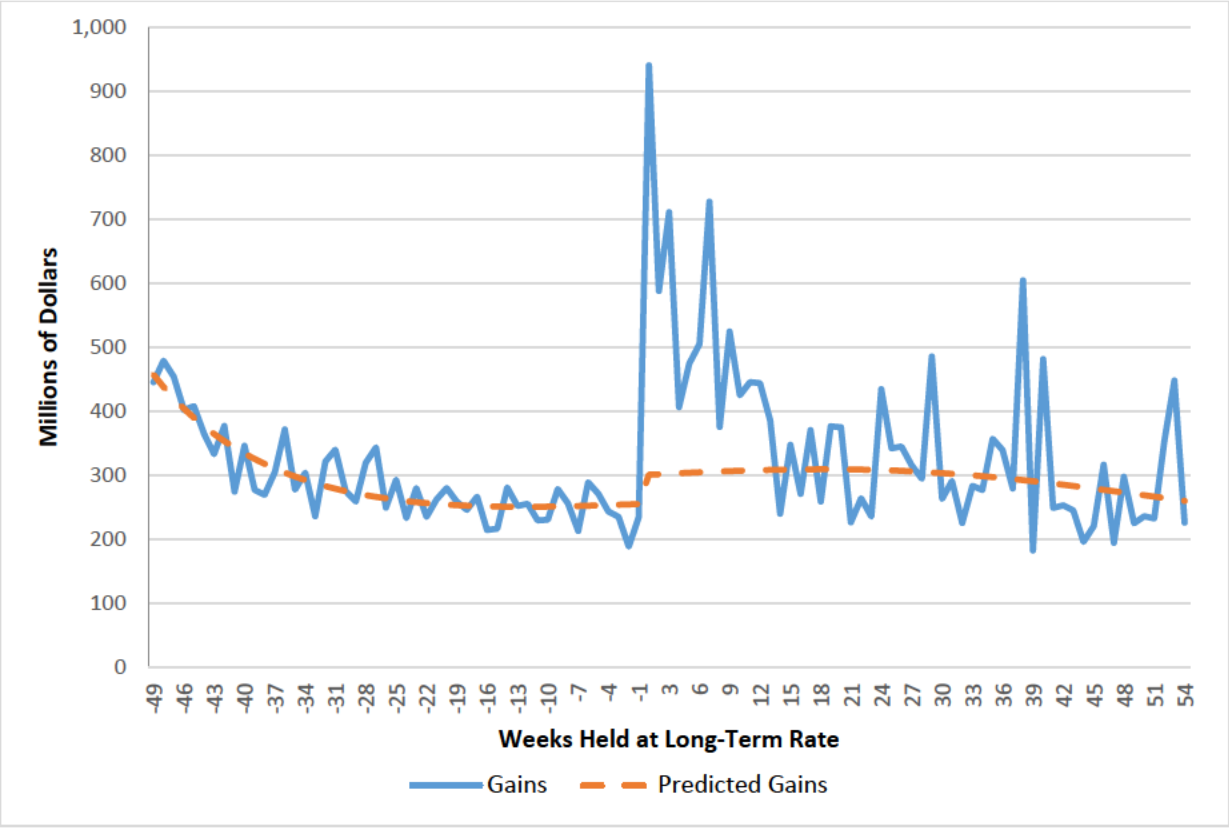
[8] The Joint Committee staff methodology is typical of the bunching method applied to notches in tax rate schedules. The method used to generate comparable estimates from 2007 to 2012 is a modification of the approach employed in Tim Dowd and Robert McClelland "The Bunching of Capital Gains Realizations", *National Tax Journal*, vol. 72, no. 2, June, 2019, pp. 323-357. The Joint Committee staff's approach explicitly adjusts for the average level of sales or gains when estimating the counterfactuals, which is done to ameliorate the effect of the asset price volatility in 2008 and 2009. A companion report to this document with details of this methodology is available in Tim Dowd, Robert McClelland, and Jacob Mortenson "Investor Responsiveness to Capital Gains Taxes During the Great Recession," *Urban-Brookings Tax Policy Center Research Report*, September 10, 2019, https://www.taxpolicycenter.org/publications/investor-responsiveness-capital-gains-taxes-during-great-recession.

on this pattern, a line is projected between weeks 43 and 60. This represents the counterfactual pattern. The Joint Committee staff repeats this exercise for each year from 2007 to 2012, to shed light on the evolution of responsiveness over time.

III. SUMMARY OF RESEARCH FINDINGS

Figure 3 shows the response to the notch — and the counterfactual distribution assuming the short-term, long-term discontinuity did not exist — in 2012. The data underlying the figure are from capital asset sales in that year. The Joint Committee staff first calculates the number of weeks the asset was held prior to sale. For example, an asset purchased in the tenth week of 2011 and sold in the fifth week of 2012 was held for 45 weeks. Then 52 is subtracted from each holding period, so that a value of "zero" means the asset was sold 52 weeks after purchase, and a value of -7 means the asset was sold seven weeks prior to 52 weeks. After assigning these values, the number of sales in each holding period week (relative to 52 weeks) are totaled and plotted. This is the solid line in the figure.

Figure 3.–Actual and Predicted Gains by Weeks Held Relative to 52 Weeks: 2012



Notes: Total gains are calculated for each holding period week in each year. Weeks are centered on week 52, which is the time period after which preferential rate on long-term gains applies. Capital gains dollar values for each year during the period 2007-2012 have been adjusted to 2016 price levels using the Consumer Price Index. Transactions with missing sales or purchase dates are excluded. Transactions by tax units with net capital losses are also excluded. Predicted gains are estimated as described in section II.

Following the approach described in Section II, the counterfactual distribution is estimated by fitting a line between weeks -49 and 54 based on the shape of the distribution of realizations excluding realizations in weeks 0 to 13.[9] The counterfactual distribution is denoted by the dashed line in Figure 3. There is a discontinuous change at zero weeks in the counterfactual distribution — in 2012 the line discontinuously increases at zero weeks — because the counterfactual distribution accounts for differences in average gains before and after the 52 week threshold.[10]

There is a substantial spike in actual realizations in the initial weeks just after the 52 week holding period, or week 0 in the figure. The difference between the actual realizations represented by the spike and the counterfactual indicates many taxpayers responded to the notch and sold assets soon after the asset was eligible for long-term capital gains rates. Because not all taxpayers face the top tax rate — resulting in variation across taxpayers in terms of the magnitude of the long-term/short-term capital gains tax rate differential — Joint Committee staff uses the average tax rate faced by taxpayers, weighted by the dollar amount of gains. In practice, this measure is often similar to an alternate measure assuming every taxpayer faces the maximum rates, as most dollars of gains are realized by individuals facing the maximum rates. The resulting elasticity associated with this spike — the percent increase in sales associated with the percent reduction in tax rates — is -0.74.

The Joint Committee staff repeats this exercise for each year from 2007 to 2011. Appendix Figures A1-A4 contain the distribution of actual realizations along with the estimated counterfactual distribution for each year. Table 2, below, reports the estimated elasticities for two different samples of taxpayers. The second column reports the estimated elasticities when including taxpayers regardless of whether they have a net gain or a net loss over all of their transactions at the end of the tax year. The third column restricts the analysis to taxpayers who have a net capital gain at the end of the tax year. These samples are presented separately because the full sample contains individuals in loss positions, for whom the one-year differential does not affect their tax position, while taxpayers with net capital gains face the short-term/long-term notch. Outside of 2008 and 2009, most of the estimated elasticities fall within the range of -0.65 to -0.79.

[9] The determination of week 13 is done through an iterative process. The Joint Committee staff begins by calculating the counterfactual using weeks 0 to 2 and determine if there is a large divergence between the beginning of the counterfactual and the actual. If there is then the number of weeks is increased. This is done until the divergence is minimized.

[10] In order to stabilize the counterfactual estimate during the Great Recession, Joint Committee staff modified the bunching method. Observing that generally there are larger average gains after the one-year holding period, the Joint Committee staff subtracts out average gains before estimating the counterfactual. This approach results in a modest change in the counterfactual distribution in 2012, but importantly, it helps to stabilize the counterfactual distribution during the Great Recession years when gains realizations were extremely volatile.

Table 2.–Short-Term Tax Elasticity of Capital Gains

Year	Full Sample	Taxpayers with Net Gain
2007	-0.68	-0.65
2008	-0.91	-1.29
2009	-1.46	-1.69
2010	-0.48	-0.69
2011	-0.74	-0.95
2012	-0.79	-0.74

Focusing on the third column, taxpayers appear to be most responsive to the change in tax rates during the height of the financial crisis in 2008 and 2009. This is likely because taxpayers realizing gains in 2008 and 2009 on assets held for under two years (*i.e.*, those accurately timing market fluctuations) are likely to be significantly different than the typical taxpayer. In particular, assets with a holding period of just over one-year and sold in 2008 would have been bought at the height of the market in 2007. Consequently, these taxpayers likely anticipated the downturn, and purchased assets that increased in price while the vast majority of asset prices fell or sold-short assets whose prices dropped precipitously.

The Joint Committee staff also investigates the degree to which taxpayer attributes are correlated with the estimated tax elasticity of capital gains for tax year 2012. In that research the Joint Committee staff finds that the estimated elasticity varies substantially depending on which taxpayers are considered. For instance, the estimated elasticity for taxpayers with a net loss at the end of the tax year are estimated to have an elasticity of -0.33 while taxpayers with at least $1,000,000 in adjusted gross income (inclusive of their net gains) are estimated to have an elasticity of -0.73.

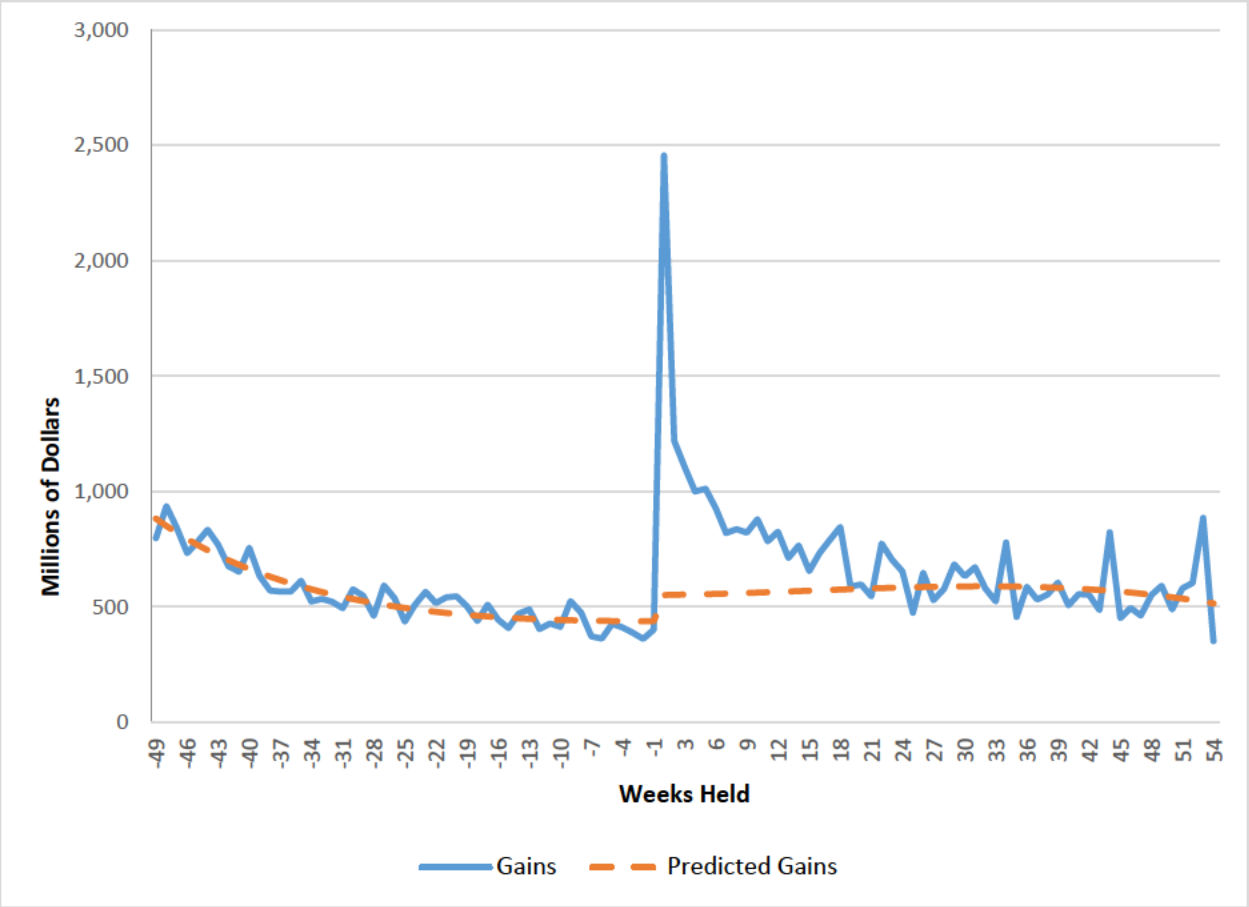
DISCUSSION OF IMPLICATIONS FOR JOINT COMMITTEE REVENUE ESTIMATES

The Joint Committee staff uses the tax elasticity of capital gains realizations with respect to the marginal tax rates to estimate the tax revenue consequences of proposed changes in capital gains taxes. This research demonstrates that taxpayers are aware of the one-year tax discontinuity, and that they alter their planned dates of sale to take advantage of the lower tax rates. This implies taxes are directly affecting the allocation of capital across asset types by encouraging individuals to hold assets longer.

Moreover, the Joint Committee staff also explore the degree to which taxpayer responsiveness adjusts during extreme asset price volatility. Examining data on capital gains realizations from 2007 through 2012, the Joint Committee staff finds that the most sensitive years are during the Great Recession. As can be seen in the graphs for 2008 and 2009 (Figures A2 and A3), responsiveness during years with extreme asset price volatility differs from more stable periods. In 2008, there is a much less pronounced spike around the one-year holding period. This spike is of a similar size as those that appear to be due to chance. In 2009, the counterfactual actually declines after the one-year holding period, reflecting the fact that very few assets held for more than one year but less than two years were in a positive return position in 2009. Part of this is due to the attributes of the taxpayers with capital gains in those years, which are likely not representative of taxpayers in general. However, another factor is the approach used to stabilize estimates during Great Recession years in which capital gains were extremely volatile, where the Joint Committee staff nets out the average long-term gain. Recalculating the elasticity without this step, for example, reduces the magnitude of the elasticity in tax year 2009. The width of the spike in 2009 also suggests that taxpayers in that year may have accelerated realizations that would have been held for a longer time frame in calmer financial times. This research shows that estimating temporary elasticities by focusing on gains from the recent purchase of assets yields roughly similar results under normal economic conditions but not during times of great financial distress.

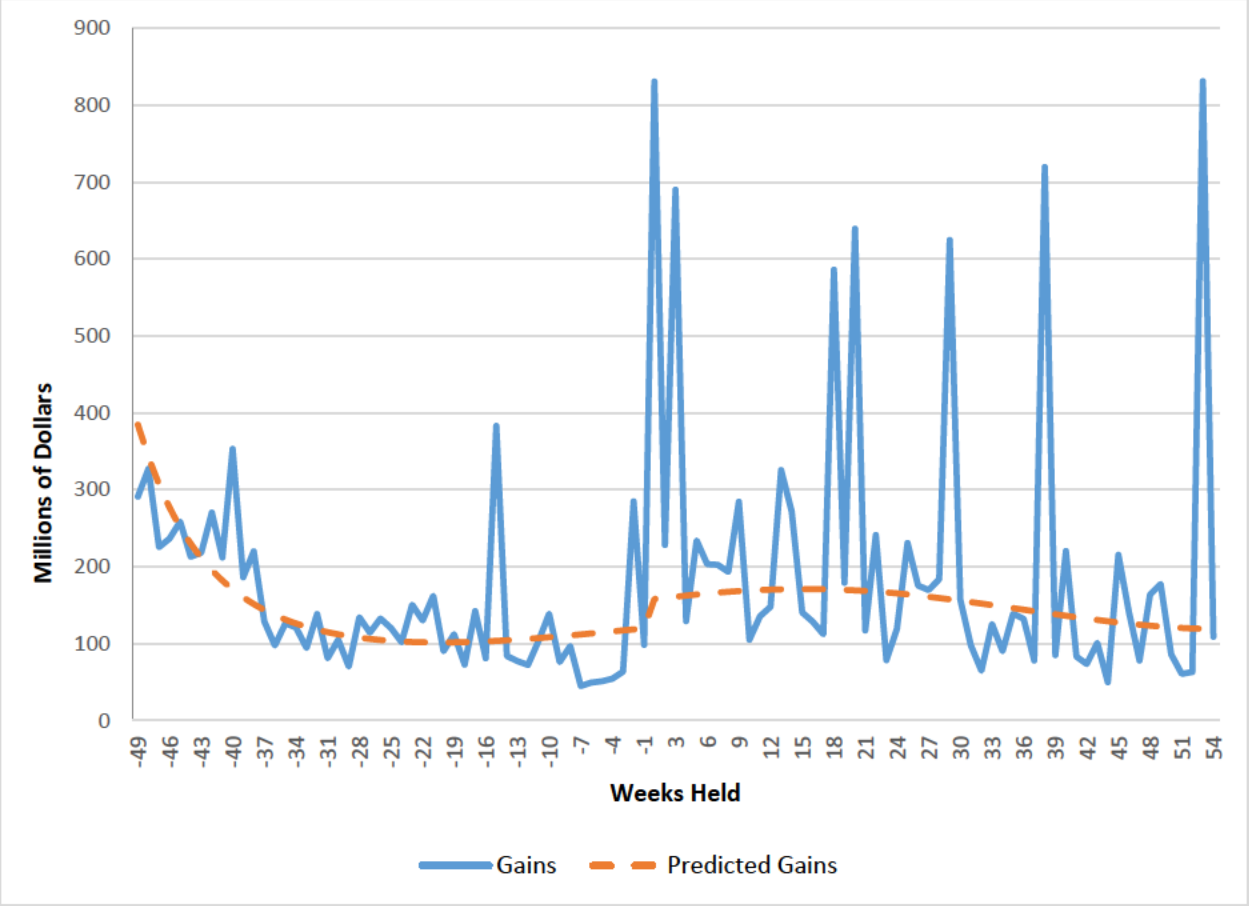
APPENDIX

Figure A1.–Actual and Predicted Gains by Weeks Held Relative to 52 Weeks: 2007



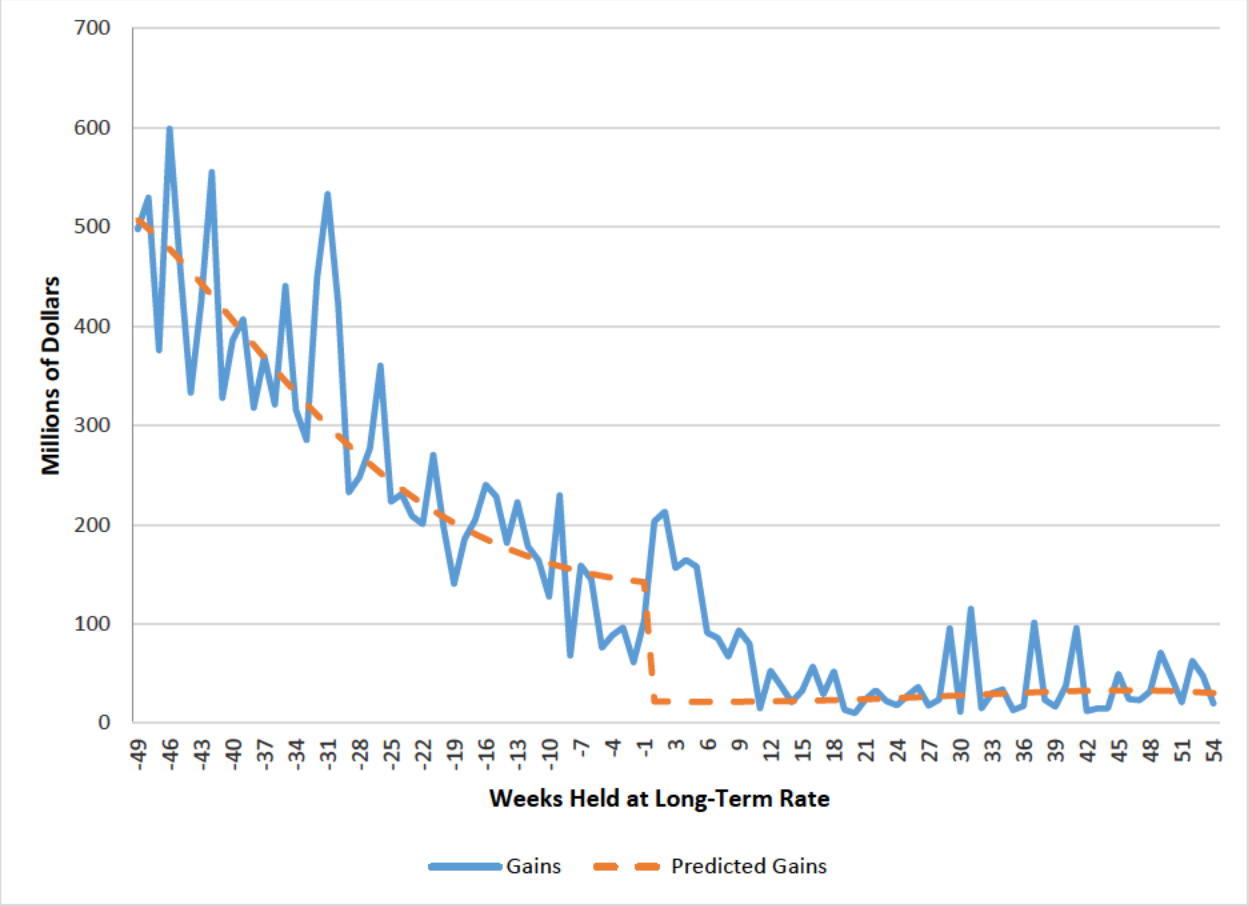
Notes: Total gains are calculated for each holding period week in each year. Weeks are centered on week 52, which is the time period after which preferential rate on long-term gains applies. Capital gains dollar values for each year during the period 2007-2012 have been adjusted to 2016 price levels using the Consumer Price Index. Transactions with missing sales or purchase dates are excluded. Transactions by tax units with net capital losses are also excluded. Predicted gains are estimated as described in section II.

Figure A2.–Actual and Predicted Gains by Weeks Held Relative to 52 Weeks: 2008



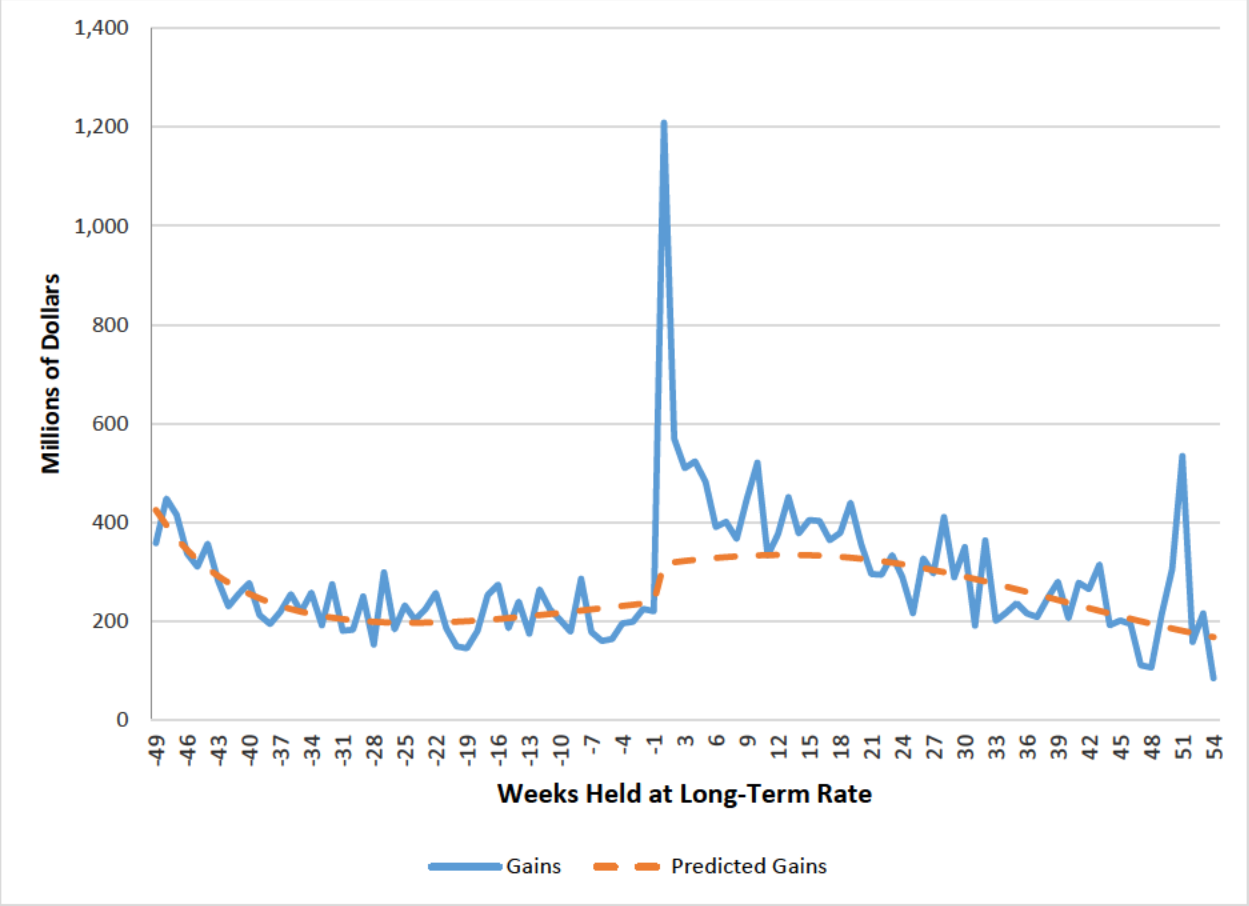
Notes: Total gains are calculated for each holding period week in each year. Weeks are centered on week 52, which is the time period after which preferential rate on long-term gains applies. Capital gains dollar values for each year during the period 2007-2012 have been adjusted to 2016 price levels using the Consumer Price Index. Transactions with missing sales or purchase dates are excluded. Transactions by tax units with net capital losses are also excluded. Predicted gains are estimated as described in section II.

Figure A3.–Actual and Predicted Gains by Weeks Held Relative to 52 Weeks: 2009



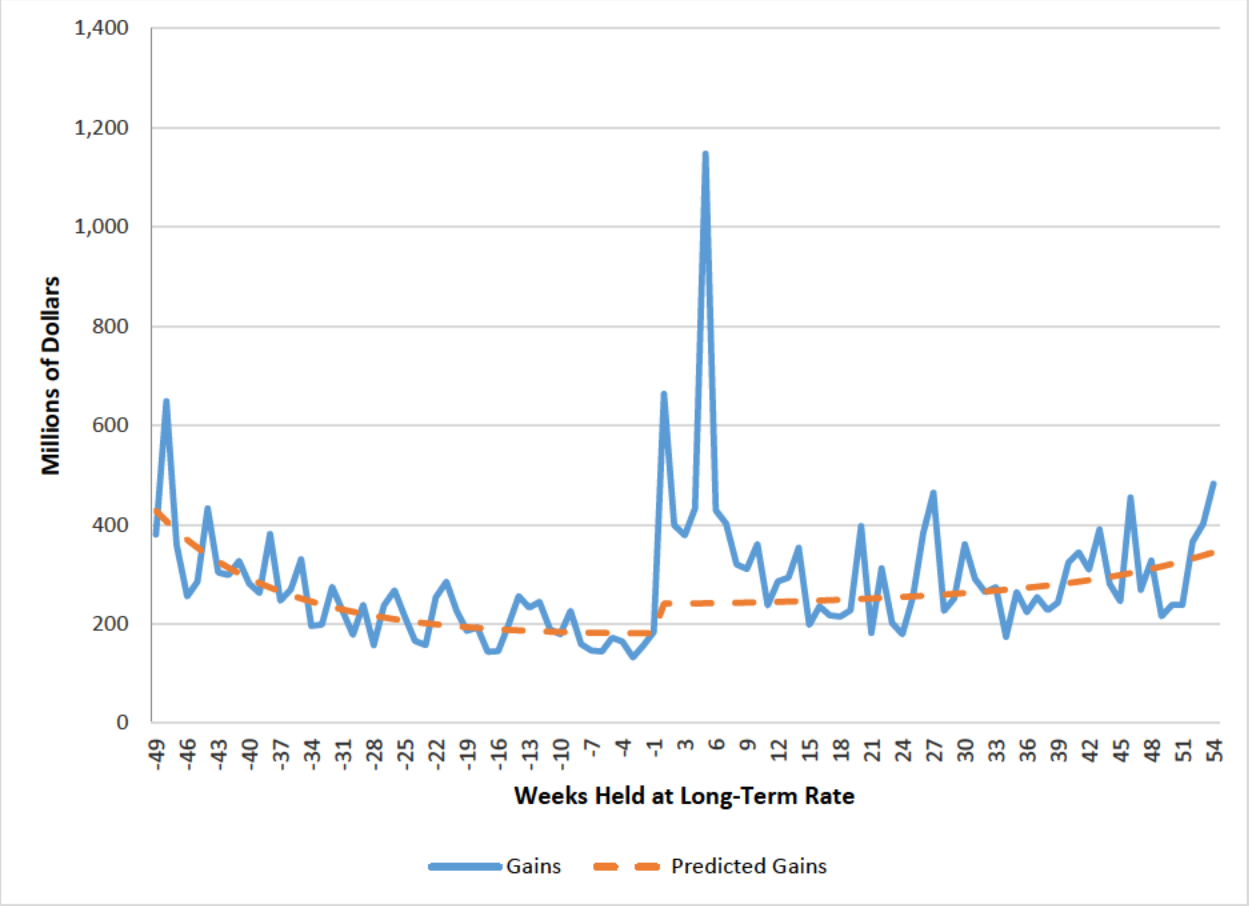
Notes: Total gains are calculated for each holding period week in each year. Weeks are centered on week 52, which is the time period after which preferential rate on long-term gains applies. Capital gains dollar values for each year during the period 2007-2012 have been adjusted to 2016 price levels using the Consumer Price Index. Transactions with missing sales or purchase dates are excluded. Transactions by tax units with net capital losses are also excluded. Predicted gains are estimated as described in section II.

Figure A4.–Actual and Predicted Gains by Weeks Held Relative to 52 Weeks: 2010



Notes: Total gains are calculated for each holding period week in each year. Weeks are centered on week 52, which is the time period after which preferential rate on long-term gains applies. Capital gains dollar values for each year during the period 2007-2012 have been adjusted to 2016 price levels using the Consumer Price Index. Transactions with missing sales or purchase dates are excluded. Transactions by tax units with net capital losses are also excluded. Predicted gains are estimated as described in section II.

Figure A5.–Actual and Predicted Gains by Weeks Held Relative to 52 Weeks: 2011



Notes: Total gains are calculated for each holding period week in each year. Weeks are centered on week 52, which is the time period after which preferential rate on long-term gains applies. Capital gains dollar values for each year during the period 2007-2012 have been adjusted to 2016 price levels using the Consumer Price Index. Transactions with missing sales or purchase dates are excluded. Transactions by tax units with net capital losses are also excluded. Predicted gains are estimated as described in section II.