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HETEROGENEITY IN THE TAX RESPONSES OF PERSONAL CAPITAL GAINS REALIZATIONS

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This article investigates the heterogeneity in the tax elasticities of personal capital gains realizations. We first examine the skewed nature of both capital gains assets ownership and their realizations. We then briefly review earlier studies, including Dowd, McClelland, and Muthitacharoen (2012). Although not chosen for this purpose, the semi-log specification used in that study allows us to explore variation in elasticity estimates across taxpayers. Finally, we focus on variation in tax responses among different assets. The elasticities of corporate stock and mutual funds are lower than our overall elasticity, while the elasticity of bonds is greater.

Keywords: capital gains realization, taxable income elasticity

JEL Codes: D12, H24, H31

I. INTRODUCTION

The tax elasticity of long-term capital gains realizations has been studied in many analyses, resulting in a wide variety of estimates. Obtaining valid estimates of the elasticity of capital gains realizations is difficult due to a number of econometric challenges, including sample selection bias, the endogeneity of tax rates, the concentration of capital asset ownership, and variation in the elasticities themselves.

Dowd, McClelland and Muthitacharoen (2012) address the first two problems by adapting a sample selection model that uses the instrumental variables for endogenous tax rates first developed in Burman and Randolph (1994a, b). They address the third problem by using a sample of tax returns that is stratified to oversample high-income taxpayers. One of their main findings is that that the elasticity of personal long-term capital gains realizations is very different from the elasticity of gains from other sources,

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such as the sales of businesses and business assets.[1] These results suggest there may be important heterogeneity in the responses of taxpayers across different types of capital gains.

In this paper, we further explore the heterogeneity issue by focusing on the variation in tax responses among the owners of different types of assets. First we use the Survey of Consumer Finances and a panel of individual taxpayers created by the Statistics of Income division (SOI) of the IRS covering the period 1999–2008 to describe the concentration of capital asset ownership and realizations. Then, we briefly review the literature on the tax elasticity of capital gains realizations, including the variation in elasticity estimates across different types of capital gains investigated by Dowd, McClelland and Muthitacharoen (2012). Next, we focus solely on personal capital gains and explore whether there is variation in the elasticity estimates across individuals. Finally, we use supplementary data on the sales of capital assets to estimate the tax elasticity of the realizations of several different types of personal capital gains.

II. WHO OWNS CAPITAL ASSETS AND WHO REALIZES THEM

Examining data from the 1992 Survey of Consumer Finances (SCF), Burman and Ricoy (1997) report that 22.4 percent of capital gains assets were held by families with incomes greater than $200,000, while more than 67 percent of those assets were held by families with incomes greater than $50,000. The median income of families in 1992 was $27,900, implying that a majority of capital gains assets were held by families with incomes well above the median (Kennickell and Starr-McCluer, 1994). The values of principal residences, however, were more evenly distributed. As reported by Burman and Ricoy, 7 percent of all principal residences were held by families with incomes greater than $200,000, while 51.9 percent were held by families with incomes greater than $50,000.

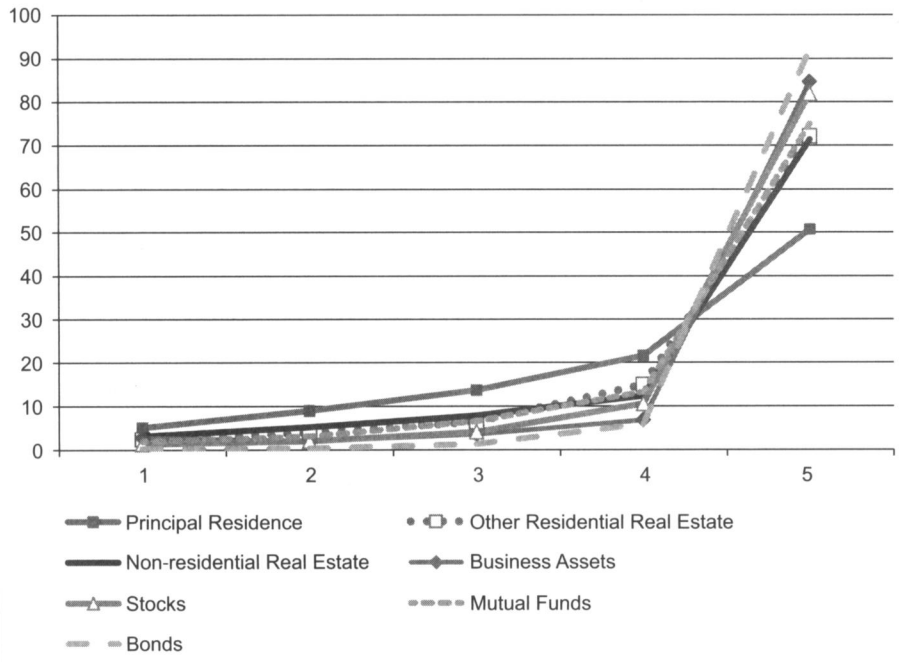
In this paper, we use pooled samples from the SCF for 2001, 2004, and 2007 to describe the weighted distribution by quintiles of family income of the ownership of assets that generate capital gains; our results are shown in Figure 1.[2] These assets include stocks, bonds, mutual funds, businesses, principal residences, and other real estate. Similar to Burman and Ricoy (1997), we find that the distributions of these assets are concentrated in families with higher incomes. Among asset types other than principal residences, at least 70 percent are held by families with incomes in the top quintile. For bonds, more than 90 percent are held by those families. Principal residences are again more evenly

[1] Personal capital assets are property owned by the taxpayer and used for personal purposes. They include such assets as personal residences, cars, furniture, stocks, bonds, land, and art. When personal capital assets are sold capital gains from those assets are reported on line 8 of Schedule D. Taxpayers may have gains from other types of capital assets that are reported on other forms or different lines on Schedule D. For instance, swaps, distributions, partnerships and S corporations, involuntary conversions, and sales of business property are all reported on lines 11–13 of schedule D and also on other forms.

[2] Family incomes are reported by survey participants, and include realized capital gains.

Figure 1

Percentage Ownership of Capital Assets by Income Quintiles, 2001–2007 SCF



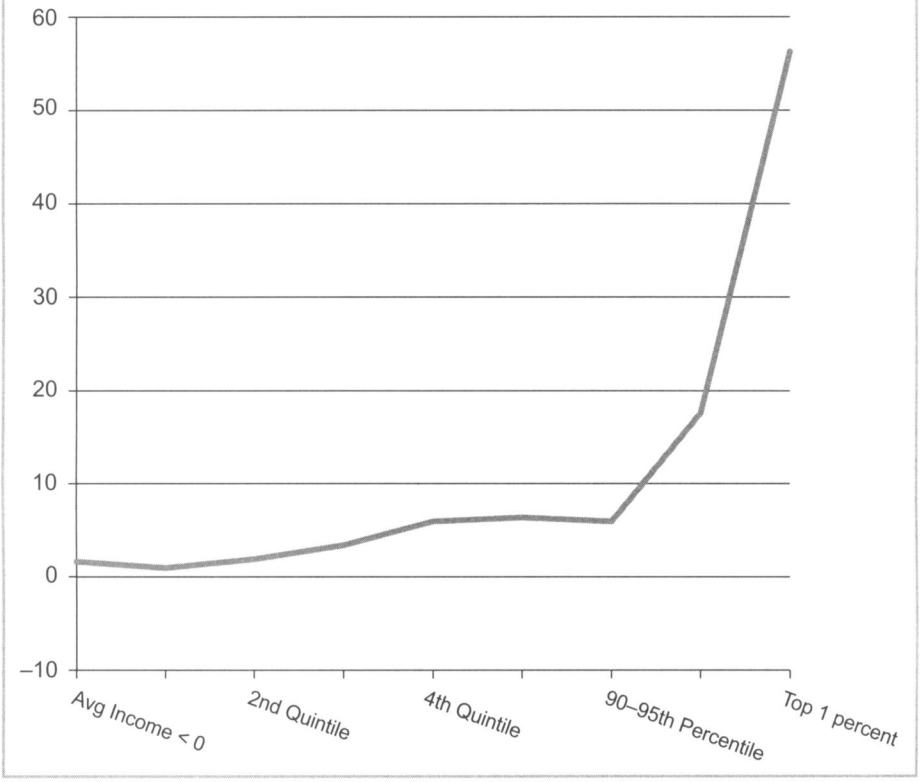
distributed, with families in the top income quintile owning about half of the total value, and the families in the fourth quintile owning about 20 percent.

The realization of capital gains has a similar distribution. Using a stratified panel of tax returns over the period 1999–2008, we describe in Figure 2 the weighted distribution of capital gains realizations by income quintiles, with the top income quintile broken out into smaller categories: 80th–90th, 90th–95th, 95th–99th and the top 1 percentile. Because realized capital gains are a component of income, distributing capital gains by income category runs the risk of simply plotting the amount of capital gains against itself. This is particularly a problem for taxpayers that realize substantial capital gains in only a single year.[3] Here, we distribute taxpayers by averaging their income across the years in which they were observed in our panel. We find that taxpayers in the top 1 percentile

[3] Alternatively, one could distribute capital gains by income excluding capital gains. In that case, some very high income taxpayers, whose capital gains income are a principal source of total income, might be placed lower in the income distribution. For example, in 2008 about one in five taxpayers with incomes in the top 1 percentile would not be included in that group if their incomes were measured without capital gains.

Figure 2

Share of Realized Gains (%) by Average Income Quintiles, 1999–2008 SOI Panel



are responsible for well over 50 percent of total personal capital gains realizations. While the bottom 80 percent of the income distribution accounts for only 14 percent of all capital gains, 86 percent of all capital gains realizations accrue to the top quintile.

Because most capital gains were realized by taxpayers in the top 1 percent of the income distribution, it is not surprising that about 96 percent of those taxpayers realize a gain in at least one year of the panel period (Table 1). However, even among those 96 percent there is a wide variation in the amount of gains realized, resulting in a very skewed distribution. Measured in 2011 dollars, the median value of capital gains realized was $82,404 while the mean value was $490,935.

III. THE TAX ELASTICITY OF CAPITAL GAINS REALIZATIONS

The variation and skewed distribution in realizations may reflect nothing more than the distribution of capital assets. But it is also possible that some of the variation is due

Table 1

Capital Gains Realization Statistics by Income Quintiles, 1999–2008 SOI Panel

	For All Returns		For Returns with Gains At Least One Year			
	Gains as Share of Income	Share of Returns with Gains or Loss	Average Gains	Median Gains	Gains as Share of Income	Average Number of Years with Gains
Average income < 0		0.50	93,362.2	10,878.5	–0.27	2.89
1st quintile	0.02	0.15	7,317.2	2,544.7	0.13	2.28
2nd quintile	0.02	0.19	11,022.3	3,213.7	0.09	2.55
3rd quintile	0.02	0.27	13,387.5	2,963.1	0.07	2.56
4th quintile	0.02	0.38	14,822.1	3,477.8	0.06	2.76
80–90th percentile	0.03	0.53	18,891.1	4,493.2	0.06	3.03
90–95th percentile	0.04	0.66	24,074.6	6,500.9	0.06	3.42
95–99th percentile	0.09	0.84	61,749.2	16,201.6	0.11	4.17
Top 1 percent	0.25	0.96	490,935.4	82,404.3	0.25	5.3

Note: All dollar amounts are in 2011 dollars.

to variation in taxpayers' response to factors such as the tax rate on capital gains. We now investigate that possibility.

Feldstein, Slemrod, and Yitzhaki (1980) provide one of the early estimates of the elasticity of capital gains realizations. Using a sample of tax returns from 1973, they estimated that taxpayers with substantial holdings of corporate stock would increase their realizations in response to a capital gains tax rate reduction by enough to raise their total taxes paid. The study sparked a flurry of other estimates, some using cross-section data on individuals with others relying on aggregate time-series data. Auten and Cordes (1991) note that cross-section estimates using data on individual observations tended to estimate elasticities below –1.0, while time-series estimates using aggregate data tended to find elasticities between –0.5 and –0.9.

Some of the variability in capital gains estimates may stem from some of the issues that complicate the analysis of the tax responsiveness of capital gains. For example, it is widely recognized that capital gains tax rates are endogenous. Even with the relatively flat statutory rate schedule at the federal level, variation in state tax rates can lead to severely biased estimates if this issue is unaddressed. In addition, the decision to realize gains and the amount realized may jointly depend on unobservable factors, confounding attempts to estimate consistently models of those decisions. Another explanation is that there is heterogeneity in the elasticities themselves.

Burman and Randolph (1994a) offer evidence that the disparity in estimated elasticities is to some degree caused by whether taxpayers viewed the changes in tax rates as "permanent" or "transitory." Auten and Clotfelter (1982) describe these concepts of permanent and transitory tax rates as being "analogous to conventional definitions of permanent and transitory income." In this way the marginal tax rate in any given year is defined as the sum of the "conventional" rate and a transient shock. The transitory tax rate is meant to capture the timing effect mentioned above, suggesting that capital gains realizations react quickly and strongly to changes in those rates.

In contrast, there are several reasons why one would expect a smaller response to a permanent change. First, a permanent reduction would lead to a higher steady-state rate of portfolio adjustment rather than the surge of unlocking of gains that would be expected from a temporary rate reduction. Second, a permanent cut in the capital gains tax rate would encourage investment over consumption, which may increase realizations only after the investment accrues an adequate level of gains. Finally, the sales of assets held to accomplish goals with specific deadlines, such as funding college expenses or individual retirement, may be timed to accomplish those goals more than to minimize capital gains taxes. In principle, a taxpayer with a specific after-tax target for accumulation may actually reduce realizations in the face of a reduction in the permanent tax rate because less investment is needed to accomplish his or her after-tax goal.

Burman and Randolph (1994b) estimate a two-step Tobit model described by the following equations:

$$(1) \quad I_{it}^{*} = \alpha_0 \tau_{ip} + \alpha_1 \tau_{it} + \alpha_2 \tau_{it-1} + X_{it1} \alpha_3 + \varepsilon_{i1},$$

$$(2)\quad \ln g_{it} = \begin{Bmatrix} \beta_0 \tau_{ip} + \beta_1 \tau_{it} + \beta_2 \tau_{it-1} + X_{it2}\beta_3 + \varepsilon_{i2} & \text{if } I_{it} > 0 \\ 0 & \text{if } I_{it} \le 0 \end{Bmatrix},$$

where the capital gains tax rates for taxpayer i at time t are represented by the permanent rate τ_{ip}, the current rate τ_{it} and the previous year's rate τ_{it-1}.[4] The vector $X_{i.}$ includes demographic characteristics, such as region, age, and variables representing unrealized gains and sources of income; and β_3 and α_3 are conformable vectors of coefficients. The indicator I^*_{it} is a latent variable representing the decision to realize long run capital gains. The second stage is a semi-log model in which $\ln g_{it}$ is the natural log of capital gains, measured as the net long-term personal gains before prior-year carryover of losses.

The permanent elasticity is measured as

$$(3)\quad e = \tau_p \left[\beta_0 + \beta_1 + \beta_2 + (\alpha_0 + \alpha_1 + \alpha_2)\lambda_t \right],$$

where λ_{it} is the inverse Mills ratio for taxpayer i at time t. Ideally, the aggregate elasticity is calculated by using a dollar-weighted average of the individual elasticities, although applying the coefficients to the dollar-weighted average tax rate and inverse Mills ratio provides a similar elasticity. The transitory elasticity is calculated in the same fashion, but only with the coefficients β_0 and α_0. Using a sample for the years 1979–1983, Burman and Randolph estimate an elasticity with respect to changes in permanent tax rates of –0.18 and an elasticity with respect to changes in transitory rates of –6.42.[5]

Auerbach and Siegel (2000) re-estimate the Type II Tobit model of Burman and Randolph on individual tax data for the years 1986–1993 and find a permanent elasticity of –0.34 and a transitory elasticity of –4.91. Using an alternative procedure for the imputation of τ_p, they estimate a permanent elasticity of –1.72 and a transitory elasticity of –4.35.

Dowd, McClelland, and Muthitacharoen (2012) follow the Auerbach and Siegel imputation. They also extend the model in several directions, including the use of a dummy variable for the presence of a carryover loss as an exclusion restriction in their Tobit Type II model. Their approach is based on the idea that the mere presence of a carryover loss provides an incentive for the taxpayer to realize capital gains without directly influencing the amount of gains to be realized.[6] Without a variable unique to

[4] The permanent tax rate is imputed as the predicted value from regressing τ_{it} on the maximum combined federal and state tax rate and all other exogenous regressors.

[5] However, their estimates are very imprecise — their permanent elasticity of –0.18 is insignificantly different from both 0 and –1.00. One likely cause of that imprecision is their use of the same set of explanatory variables to model both the decision to realize capital gains and the amount of gains to be realized.

[6] Dowd, McClelland, and Muthitacharoen (2012) show that the carry over loss variable is statistically insignificant in the second stage equation in the double-hurdle model, supporting the use of that variable as an exclusion restriction.

the first stage, the identification of the coefficient estimates is based entirely on the functional form imposed by the Probit specification — leading to large standard errors if there is not much variation in the sample. They also attempt to control for the financial sophistication of taxpayers. If investors become more knowledgeable as they become more experienced in trading, the number of transactions is a measure of their financial acumen — although arguably very high frequency trading may actually indicate the opposite. In their paper, Dowd, McClelland, and Muthitacharoen use categorical dummy variables for the number of short-term realizations made in the prior year as a flexible set of proxies for taxpayer sophistication.

In addition, any decomposition of elasticities into those attributable to permanent tax rate changes and those attributable to transitory tax rate changes presupposes the existence of a permanent rate. Yet the numerous changes in federal and state tax rates in the last 30 years suggest that rates are anything but permanent. In addition, the current uncertainty over the expiration of tax laws that determine federal tax rates makes it difficult or impossible for taxpayers to determine the permanent rate. However, such a decomposition is not required to analyze the effects of tax rates on capital gains realizations.

Dowd McClelland, and Muthitacharoen (2012) instead consider the effect of next year's anticipated rate, the current rate, and the prior year's rate. The sum of the coefficients on those three variables reflects the effect of an increase in the tax rate, holding changes relative to the previous year and the next year constant. This occurs when a tax rate has persisted over the previous year and is also expected to persist into the next year. This approach is thus similar to a standard distributed lag model.

They estimate a dollar-weighted persistent elasticity of –0.79 and a transitory elasticity of –1.20. Both elasticity estimates are statistically significantly different from zero but not –1.00.[7] They attribute the relatively small estimate of the transitory elasticity to the large number of taxpayers paying the maximum federal capital gains rate as a result of the flattening and simplification of the capital gains tax structure that has occurred since the time periods studied by Burman and Randolph and Auerbach and Siegel. A flatter and simpler capital gains rate structure implies a lack of opportunity for high-income taxpayers to realize their capital gains at a lower tax rate and, therefore, may explain a relatively lower transitory elasticity.

IV. HETEROGENEITY IN TAX RESPONSES ACROSS THE DISTRIBUTION OF GAINS AND ACROSS ASSET TYPES

While it is possible that the flattening and simplification of the rate schedule reduces transitory elasticities, it does not eliminate the heterogeneity of responses. There is still intra-state variation in tax rates, as well as changes in tax rates over time. The inverse Mills ratio, which represents the propensity to realize a gain, also varies across taxpay-

[7] The 95 percent confidence interval for the persistent elasticity is [–0.58, –1.00].

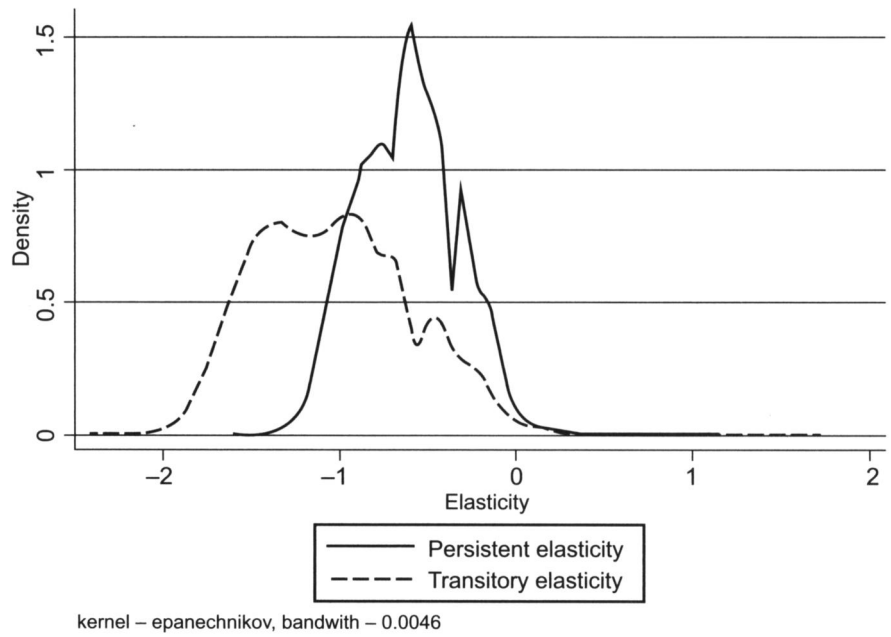
ers and over time. Thus, persistent and transitory elasticities vary across taxpayers and over time as taxpayers face different tax rates and have different propensities to realize capital gains. Here we reproduce the taxpayer-level estimates from Dowd, McClelland, and Muthitacharoen (2012) and estimate a weighted kernel density function using a standard Epanechnikov function.

Figure 3 reveals a wide variation in both the persistent and transitory elasticities. The distribution of transitory elasticities appears to be wider than the distribution of persistent elasticities. Although the distribution is thinner and the mean is closer to zero, 14.1 percent of the persistent elasticities are greater than one in absolute value. Slightly more than 27 percent of the persistent elasticities are less than 0.5 in absolute value. The mean elasticity is –0.679, indicating that the dollar weighting scheme applied to our estimate of –0.792 slightly increases the estimated responsiveness of taxpayers.

In any given year taxpayers may have different elasticities from each other, and each taxpayer has up to eight elasticities, one for every year in which they file a return in

Figure 3

Kernel Distribution of Persistent and Transitory Elasticities



2000 through 2007. Overall variation in those elasticities may be decomposed into how average elasticities vary across taxpayers and how elasticities for each taxpayer vary over time. In our sample about 65 percent of the variation is due to variation across taxpayers, while the remaining variation occurs over time.[8] While we did not calculate the standard errors for each taxpayer's elasticity in each year, it is still useful to note that some taxpayers may have elasticities that are above one in absolute value for every year they are in the sample, other taxpayers have elasticities that are below one in absolute value for every year they are in the sample, and still other taxpayers have elasticities that are above one in absolute value in some years and below it in others.

Using the stratification weights for consistency, we estimate that 75 percent of taxpayers always have elasticities that are less than one in absolute value. Those taxpayers realized about 45 percent of all gains. It follows that 25 percent of taxpayers had an elasticity in one or more years greater than one in absolute value, and they realized about 55 percent of gains. To further examine the implication that taxpayers with larger gains tend to have higher elasticities, we calculate the number of taxpayers with elasticities above and below –0.5. We find that 31 percent of taxpayers had elasticities that were greater than 0.5 in absolute value in every year, and those taxpayers realized 68 percent of all gains. About 69 percent of taxpayers had an elasticity less than 0.5 in absolute value in at least one year, but they realized only 32 percent of all capital gains. These findings suggest again that those taxpayers with stronger responses to tax rates tend to have larger capital gains realizations.

The kernel density estimates highlight the fact that there is considerable variation in elasticities. Because the estimated coefficients are constant across taxpayers, that variation occurs only through the variation in tax rates faced by taxpayers and their propensity to realize a capital gain. However, taxpayers may vary in their sensitivities to tax rates in ways not handled by (3). In particular, their sensitivity may depend on the type of asset they are holding. Assets are held for a variety of reasons and face very different transaction costs that may play an important role in how responsive taxpayers are to changes in tax rates. For example, corporate stock is a capital asset held principally for investment that may be quickly and inexpensively purchased and sold. Business assets, on the other hand, can have much higher transactions costs involved in their purchase and sale.

To begin, we link information from a unique data set containing transaction level information on the Sale of Capital Assets (SOCA) with our panel of tax returns. The SOCA data are transaction level data reporting the type of asset, date of purchase, date of sale, purchase price, and sale price for each capital asset that is sold by each taxpayer included in the panel.[9] Each taxpayer in the panel who reports a capital gain is included

[8] Using dollar-weighted elasticities to decompose the variation of elasticities into variation across taxpayers and variation over time, 62.8 percent is across taxpayers. These estimated correlations have trivially small standard errors.

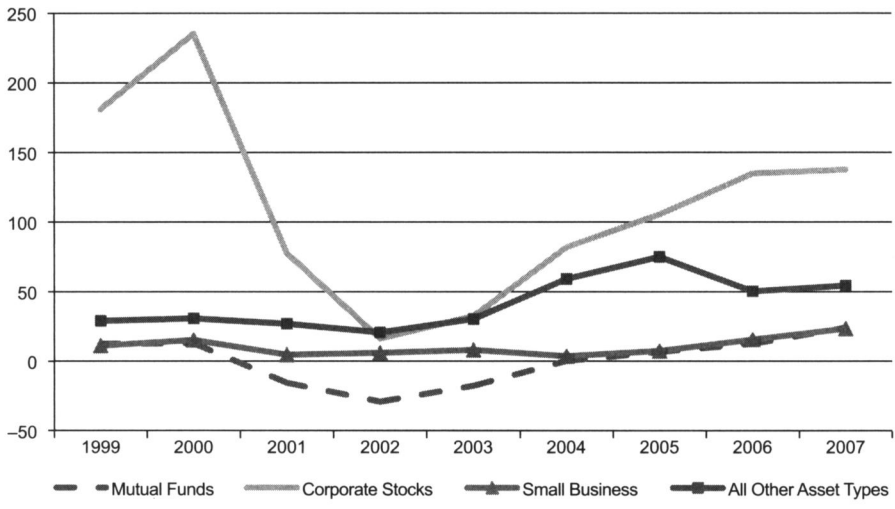
[9] See Weber and Bryant (2005) for a detailed description of the stratification and selection process of the 1999 edited panel. See also Wilson and Liddell (2009) for a description of the SOCA data set and attrition from the sample and sampling methods.

in the SOCA data set. For each of these taxpayers, all transactions from the sale of a capital asset are recorded. For this analysis, we restrict the data to personal long-term capital gains realization. Even after restricting the data to only personal gains, there were 57 transactions, on average, for those reporting long-term capital gains in the tax year 2007. As with the skewed distribution of total gains, the distribution of the number of transactions is also quite skewed; for tax year 2007, one percent of the distribution had more than 900 long-term personal capital gains transactions in 2007. In creating the SOCA data set, SOI identifies 23 different categories for the type of asset sold. We have grouped the 23 categories into 8 main types of assets: mutual funds, stocks, bonds, other financial assets, small business assets, other business assets, principal residences, and other.[10]

Figure 4 plots the total sales for selected asset types from 1999 through 2008. With the exception of 2003, corporate stock has the greatest aggregate value at sale. The decline in realizations in 2003 reflects the stock market downturn of 2002 — the S&P 500 was

Figure 4

Disaggregated Taxable Personal Capital Gains Realizations, 1999–2007, $Billions



Note: All dollar amounts are in 2008 dollars.

[10] Other financial assets includes put and call options, commodities and futures, involuntary conversions, balancing transactions, and section 1202 small business stock. Small businesses includes pass through entities and partnerships, trusts, and S-corporations. Other business assets includes residential rental, depreciated business personal property, and depreciated business real property. Finally, other assets include livestock, timber, land, farmland and ranches, and assets not identified by SOI.

Table 2

Persistent and Transitory Elasticity Estimates of Disaggregated Personal Capital Gains

	Persistent Elasticity		Transitory Elasticity		
Type of Realized Asset	Estimate	Standard Error	Estimate	Standard Error	Number of Observations
All personal capital gains	–0.79	0.11	–1.20	0.35	70,377
Mutual funds	–0.46	0.16	–0.91	0.42	19,073
Corporate stocks	–0.54	0.14	–1.01	0.45	53,983
Bonds	–0.84	0.36	–1.58	1.17	18,498
Other financial assets	0.93	1.56	–2.88	3.38	2,283
Small businesses	–1.67	0.49	–0.85	1.60	11,609
Other business assets	–0.70	0.60	–0.14	1.54	3,448
Principal residence	0.61	2.42	–4.14	5.03	1,631
Other assets	–2.03	0.67	–2.93	1.50	20,780

1172.51 on January 2, 2002 and did not exceed that value until Nov 12, 2004. At the low point the index was 776.76, nearly one-third below the January 2 value. Undoubtedly, much of the decline in aggregate value reflects stock sold at a loss.

In estimating the tax elasticity for each of the disaggregated asset types, we follow the same methodology as Dowd, McClelland, and Muthitacharoen (2012), applied separately to each of the eight disaggregated personal capital assets. Table 2 reports the persistent and transitory elasticity estimates for each of the 8 categories of assets as well as the persistent elasticity from Dowd, McClelland, and Muthitacharoen. Interestingly, both mutual funds and corporate stocks have a persistent elasticity of approximately –0.5, smaller in absolute value than the overall elasticity. This is particularly interesting since corporate stocks are generally fairly liquid and make up the majority of personal capital gains realizations in most years. It appears that small business assets with an elasticity of –1.7 and other assets with an elasticity of –2.0 are increasing the overall elasticity for all personal capital gains in absolute value. All of the transitory elasticity estimates are negative and, except for other business assets, are larger in absolute value than the persistent elasticity estimates. However, we urge caution in interpreting these disaggregated elasticities. Some of the elasticities are estimated with very few observations, and the standard errors are quite large. Additionally, a more rigorous estimation model might take into account how much a taxpayer realizes of one asset type might be dependent on the realization amounts of other types of assets.

V. CONCLUSION

In this paper, we investigate the heterogeneity of taxpayers' responses to capital gains tax rates. We first examine the asset holding patterns across the distribution and, not surprisingly, find that capital asset ownership and realizations are highly concentrated at the top of the income distribution. Only ownership of a personal residence is of importance for the bottom four income quintiles. In contrast, other asset types are extremely concentrated at the top; for example, families located in the bottom four income quintiles have ownership rates of bonds of less than 7 percent, on average. We also find considerable variation in the tax elasticity of capital gains realizations of taxpayers depending on the tax rate they face, their propensity to realize a gain, and on the type of assets they hold. Our findings suggest that taxpayers with stronger responses to tax rates tend to have larger capital gains realizations. We also find evidence that the tax responsiveness of corporate stocks and mutual funds is lower than that of bonds and small business assets.

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