Tax Evasion and Self-Employment in the US: A Look at the Alternative Minimum Tax

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I. Introduction

The alternative minimum tax (AMT) for individuals is a separate system of income taxation that operates in parallel to the regular income tax. Taxpayers who may be subject to the AMT must calculate their taxes twice (using both the regular and the AMT income tax rules), then pay the larger amount of tax. In other words, the AMT can be viewed as an additional tax levied on taxpayers whose regular tax is found to be too low relative to their income.

Although Congress originally enacted the AMT to ensure that high-income individuals pay at least a minimum amount of tax each year, it now affects many tax filers in the middle class. One reason for the expansion of AMT is that, unlike the regular tax system, the AMT tax brackets are not indexed for inflation. In addition, the tax cuts passed during the early 2000s exacerbate the AMT problem because they reduce regular income taxes without a corresponding permanent reduction in the AMT (Lim *et al.,* 2009). The tax cuts and lack of indexation combine to push the AMT onto millions of taxpayers. A total of 27 percent of households that paid the AMT in 2008 had adjusted gross incomes of $200,000 or less (Bryan, 2010).

Every year taxpayers need to consider if they need to pay the AMT. The IRS web-site provides an AMT assistant to help taxpayers determine whether they may be subject to the AMT. If the results show someone might owe the AMT, he may need to complete Form 6251 to find out for sure and to determine how much he owes. And if this person triggers the AMT, his average tax rate would typically go up, sometimes substantially. The AMT system also brings additional administrative burden to taxpayers.

This paper exploits the parallel structure of the regular income tax and the AMT to investigate a series of questions. First, do households manipulate their incomes in order to avoid the AMT as they move toward the AMT threshold? If such "bunching" is found, is there any difference between self-employed individuals and wage earners? More importantly, does the behavioral response come from misreporting or real activity change?

Studying the effect of taxes on economic behavior is important. First, the behavioral response of taxpayers affects the tax revenue. Second, it affects economic efficiency or deadweight loss (Feldstein, 2008). This paper follows in the spirit of Saez (2010), who examined the bunching of taxpayers at kink points created by the Earned Income Tax Credit (EITC). It is the first to study potential bunching behavior created by the AMT at the top end of the income distribution, and whether such bunching behavior is driven by misreporting or real activity change. The results have important policy implications. If a behavioral response is found and it is mainly driven by misreporting, the welfare losses are the tax revenue loss and the costs of tax planning. However, if the response is driven by both misreporting and real activity change, the total deadweight loss is substantially greater than under the first case. Additional deadweight loss occurs because households adjusted their labor supply or other activities to avoid higher tax. The deadweight loss from both misreporting and real activity change is larger than that from misreporting only.

To analyze how households respond to the AMT, we use the IRS Individual Public Use Tax Files for 1994–2002. These files contain the information directly from a large sample of individual tax returns representative of the entire population of returns. We limit our analysis to those who filed Form 6251 and calculate each person's gap between the regular income tax and the AMT, which we call the AMT gap. Then we plot histograms of the AMT gap and find evidence that suggests that taxpayers manipulate their income just below the AMT threshold. A formal test (McCrary, 2008) provides evidence that bunching exists. We further explore the difference between self-employed individuals and wage earners. We find the bunching created by self-employed individuals locates further away from the AMT threshold than the bunching created by wage earners, which suggests that the self-employed act more aggressively to avoid the AMT. To explore potential causes of the bunching, we use a consumption-based method (Pissarides and Weber, 1989)

to estimate whether the bunching is created by misreporting or real activity response. We find suggestive evidence of both a real response and misreporting.

II. Literature Review

Some of the most related studies on the self-employed's behavioral response to the US income tax schedule focuses on the lower end of income distribution. Using tax return data, Saez (2010) found clear evidence of bunching at the first kink created by the EITC, and the bunching was solely concentrated among self-employed taxpayers. However, it was unclear whether the bunching represents changes in real labor supply or misreporting. Kuka (2013) took advantage of a natural experiment (1993 EITC expansion) to exploit the mechanism underlying the different bunching behaviors. He assumed people truthfully revealed their income in survey data, and compared estimates of labor supply effects from survey data (the March Current Population Survey) and the Public Use Tax File data. He concluded that the bunching behavior found in Saez (2010) was mainly driven by tax noncompliance (i.e. tax evasion).

Some related studies looked at behavioral responses to government programs. Ramnath (2013) used Public Use Tax Files to test whether taxpayers bunch their income at the notch created by the Saver's Credit. She found strong evidence that bunching occurs in response to the credit. In addition, she found that the credit failed to increase savings among low- and middle-income taxpayers. Some studies examined behavioral responses to foreign tax regimes. Chetty *et al.* (2009) used tax return data from Denmark and found that bunching occurred when the top rates started to apply. However, they did not find much evidence of bunching at lower kink points. Kleven and Waseem (2013) used tax return data in Pakistan to find bunching behavior at different notch points. They found larger and sharp bunching for the self-employed alongside much smaller bunching among wage earners. They attributed the bunching for wage earners to real labor responses. The sharper bunching for the self-employed was created by tax evasion in addition to real labor responses.

To our knowledge, no study has examined the behavioral response to the AMT. This study is among the first to explore the bunching behavior when taxpayers approach the AMT threshold.

III. Data and Evidence of Behavioral Response to the AMT

Compared to the regular income tax, the AMT defines income differently, imposes different tax rates, and allows different deductions, exemptions and credits (Lim *et al.,* 2009). Whether a taxpayer is subject to the AMT depends on various aspects of his tax return, such as the number of dependents, state tax level, and filing status. In general, the AMT imposes a higher rate of tax on the marginal income than the regular tax does. Since there is no third-party reporting, self-employed taxpayers have more opportunity to move their incomes below the level where they might trigger the AMT. The resulting discontinuity in an individual/household's tax liability fosters a strong incentive to forgo that extra dollar of income—either by altering real activity or by misreporting income. Unlike nonlinearities introduced by the tax brackets in the regular tax system, the jump from the regular tax to the AMT gives taxpayers a stronger reason to manipulate their income and tax deductions.

This paper uses the Individual Public Use Tax Files for 1994–2002. We concatenate yearly data into one pooled cross-sectional dataset. The Public Use Tax Files are an annual cross-section of tax returns available since 1960. The files are rich in income information drawn directly from tax returns. Since the AMT is set to target high-income taxpayers, the fact that the Public Use Tax Files over-sample wealthy individuals or individuals with business income makes it a good dataset to study the bunching behaviors (Ramnath, 2013), especially the behaviors of self-employed individuals near the AMT threshold.

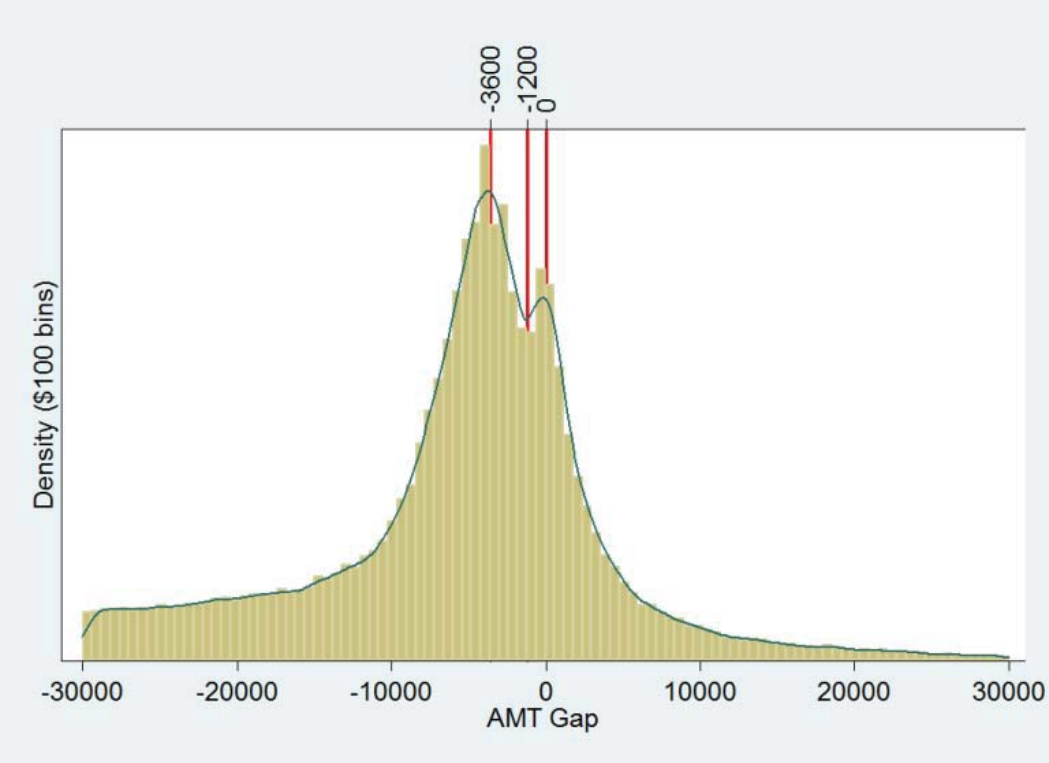
If a taxpayer is likely to owe the AMT, he is likely to work through tax Form 6251 to determine if he actually owes the AMT and how much he owes. We limit our sample to those who filed Form 6251, which yields a sample size of 120,488 returns. Those taxpayers who work through Form 6251 are arguably more informed about the AMT structure than those who do not file the form, and they are more likely to manipulate their incomes to avoid the AMT liabilities. In addition, these people are most likely at the margin of filing the AMT. Therefore, what we estimated can be interpreted as an upper bound of the behavioral response to the AMT. In addition, the results presented here are all suggestive evidence because the data are pooled cross-sections.

Previous studies have used histograms of Adjusted Gross Income (AGI) to find bunching around kink or notch points. Saez (2010) plotted histograms of the distribution of AGI with small bins and checked whether spikes appeared at kink points in the Earned Income Tax Credit (EITC) schedule. Ramnath (2013) used normalized AGI[1] to produce a histogram around the notch point in response to the Saver's Credit. Unlike prior studies, one of the challenges of detecting bunching behaviors brought by the AMT is that there is no clear population cutoff to trigger the AMT. Unlike EITC and Saver's Credit, every taxpayer's AMT liability is different even with the same amount of AGI. One's AMT liability depends not only on his AGI, but also on his filing status, state and local taxes, and number of personal exemptions, etc. The complicated tax structure makes it impossible to find the bunching just by plotting the AGI distribution.

To detect any discontinuity in the AMT, this paper creatively plots histograms and density distributions using an AMT gap concept. We define the AMT gap as the difference between the AMT liability and the regular tax liability. First, we calculated each person's AMT liability based on his tax return information on Form 1040 and Form 6251. Then we subtracted his regular tax liability from his projected AMT liability to calculate the gap. The AMT gap is positive if one's AMT exceeds his regular tax. Because bunching is most likely to be observed near a gap of zero, we drop the taxpayers whose AMT gaps are extremely high or extremely low. Our sample is limited to those within $30,000 of their individual-specific AMT thresholds.

Since the AMT's rules are known ahead of time and tax returns for the self-employed are not based on third-party reporting, taxpayers (especially the self-employed) have an incentive to set their AGIs just below the threshold where the AMT will take effect. If there is a bunching in the AGI distribution, there will be a corresponding bunching in the tax liability distribution. Figure 1 shows the kernel density estimate of the AMT gap for 1994-2002 as the solid line.[2] The graph overlays a histogram of the actual data.

FIGURE 1. Kernel Density of AMT Gap, 1994–2002



NOTE: The solid line represents the kernel density estimate for the AMT gap distribution.

[1] She multiplies single filers' AGI by 2, and head of household's' AGI by 4/3.

[2] We use the Epanechnikov kernel.

There are three interesting results in the graph. First, we observe taxpayers bunching just below the threshold at which the AMT exceeds the regular income tax. In addition, there is a sharp notch around -$3,600. There also appears to be a dip in the distribution around -$1,200. Although the kernel density graph provides clear evidence of bunching, we perform a more formal test for a break in the density. McCrary (2008) developed a test for detecting manipulation of a running variable in the context of regression discontinuity (RD) estimation. A running variable is what a policy is based on. In this paper, whether a person should pay the AMT depends on his AMT gap. In our case, the AMT gap is the running variable. Assuming the distribution of the AMT gap would be continuous if Form 6251 were merely a mathematical exercise that had no bearing on tax liability, a break in the estimated density would indicate manipulation of the running variable. In a RD design, bunching in the running variable has the potential to be problematic (Ramnath 2013). But in this paper, bunching serves as evidence of a behavioral response to the policy.

The McCrary Test first creates an under-smoothed histogram where no one bin contains points both to the left and to the right of the break. Then it uses local linear regression to smooth the histogram and provide an estimate of the density of the AMT gap. These two steps provide visual evidence for whether a break exists in the data. Following McCrary (2008) and Ramnath (2013), the test statistic for estimating the break is derived by taking the log differences in distribution of the AMT gap variable at the notch, given by $\hat{\theta} = \ln\hat{f}^{+} - \ln\hat{f}^{-}$, where $\ln\hat{f}^{+}$ is the log of the distribution of the AMT gap on the right of the break, and $\ln\hat{f}^{-}$ is the log of the distribution of the AMT gap on the left of the break. The statistic $\hat{\theta}$ measures the difference in the density at the notch between left hand side and right hand side. The null hypothesis is that $\hat{\theta}$ is zero at the notch, which indicates no bunching occurred. Figures 2–4 show graphical results of the test. Table 1 gives the numeric results from the break tests and indicates all three breaks (-$3,600, -$1,200 and $0) are significant in the distribution of the AMT gap variable.

FIGURE 2. McCrary Test of Estimated Density of AMT Gap ($0), 1994–2002

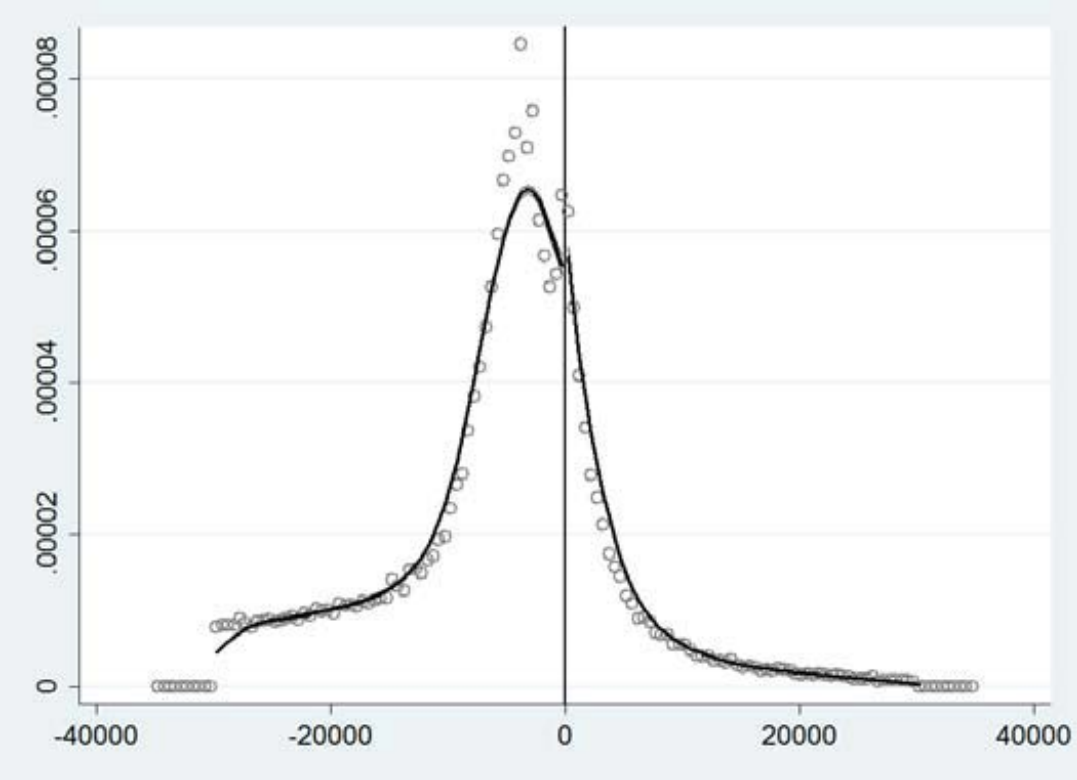


FIGURE 3. McCrary Test of Estimated Density of AMT Gap (-$1,200), 1994–2002

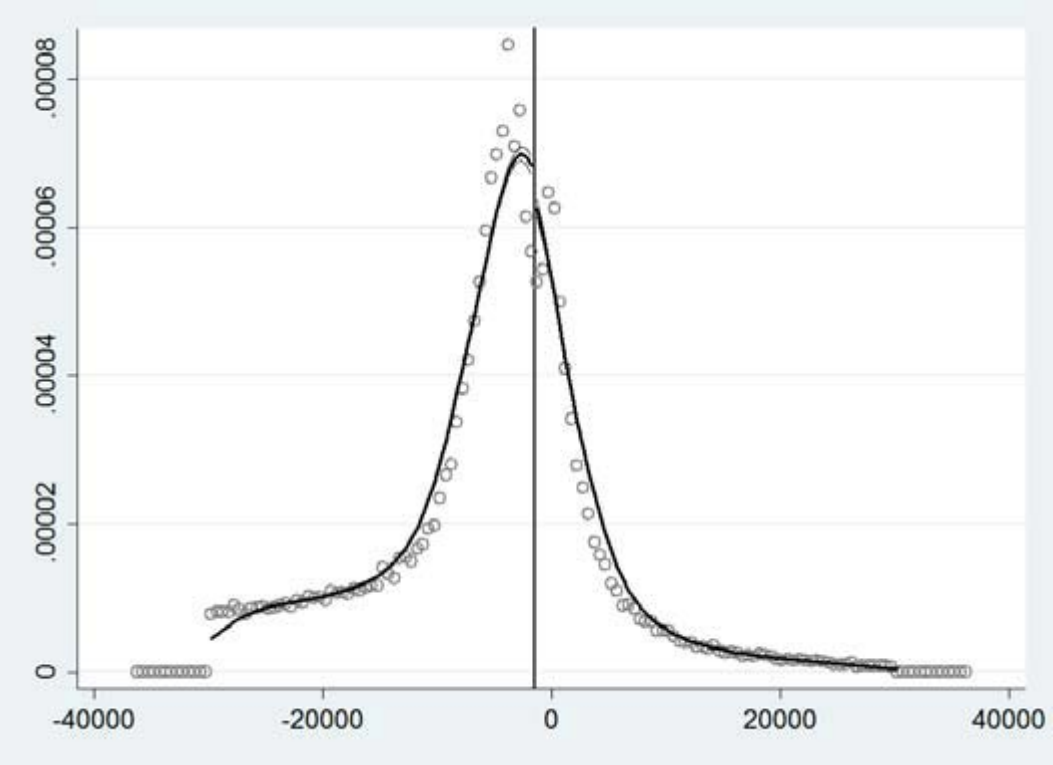


FIGURE 4. McCrary Test of Estimating Density of AMT Gap (-$3,600), 1994–2002

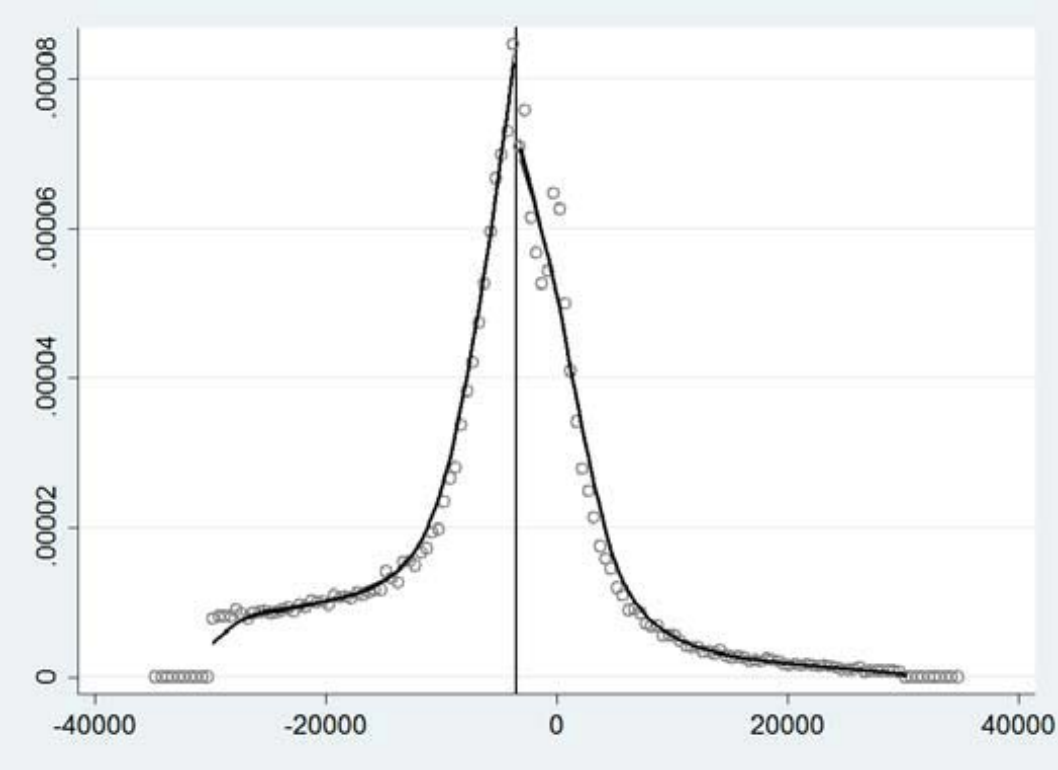


TABLE 1. Test for Breaks in the Estimated Density of the AMT Gap, 1994–2002

	Test 1 ($0)	Test 2 (–$1,200)	Test 3 (–$3,600)
$\hat{\theta}$	0.104***	–0.048***	–0.167***
standard error	(0.017)	(0.014)	(0.015)
binsize	500	500	500
bandwidth	4,892.5	6,046.0	4,751.6

*** indicates 1% statistical significance.

The main finding from the density graph is that there is a small bunching around the AMT threshold and a sharp bunching around -$3,600 combined with a drop in the density around -$1,200. This provides clear evidence of a response to the tax structure. In addition, the McCrary tests show that the density is always higher at the side that is further away from the AMT triggering point, which indicates that taxpayers try to manipulate their income to avoid the AMT.

Given that bunching does exist in the data, we next explore the difference between the self-employed individuals and the wage earners. For the purpose of this paper, we start with a broad definition of self-employment. A person is treated as self-employed if any of his income/losses comes from Schedule C, Schedule E or Schedule F. A wage earner is one who has no Schedule C, E or F income. Detailed summary statistics of these two groups are presented in Table 2. The self-employed have higher median AGI, AMT liability, and regular tax liability. However, a lower percentage of the self-employed pay the AMT (23 percent) than wage earners (27 percent)

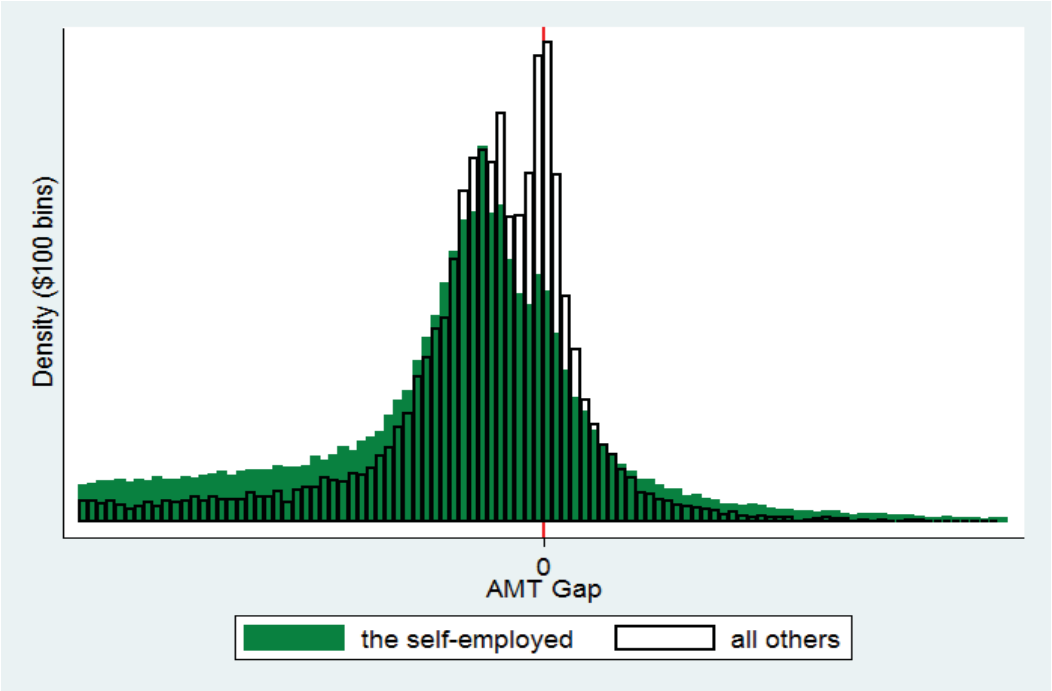
Figure 5 presents a histogram of all self-employed individuals overlayed by a histogram of all wage earners in 1994-2002. We notice two main differences between self-employed individuals and wage earners. The mass of the distribution of self-employed individuals is to the left of zero (the regular tax side). It suggests that the self-employed act more aggressively to avoid the AMT. We observe that wage earners also manipulate their income around zero, which suggests possible changes in real activity.

TABLE 2. Summary Statistics of the Self-Employed and Wage Earners

Variable	Self-Employed	Wage Earners
Adjusted Gross Income (median)	255,105.3	168,427.9
AMT Liability (median)	40,813.17	16,377.75
Regular Tax Liability (median)	41,190	19,190
Single (=1 if filed as single)	0.14	0.27
Head of Household (=1 if filed as head of household)	0.02	0.04
Married Filing Jointly (=1 if filed jointly)	0.81	0.66
Married Filing Separately (=1 if filed separately)	0.02	0.03
Average Number of Exemptions	2.72	2.52
State and Local Tax (median)	9,023.1	2,552.0
AMT Gap (median)	–4,302.8	–2,887.4
% Pay AMT	0.23	0.27
Interest Paid Ratio*	0.075	0.045
Property Tax Ratio	0.028	0.022
Charitable Donation Ratio	0.034	0.020
Sample Size	100,198	20,290

*Interest paid ratio, property tax ratio, and charitable donation ratio are three tax-based consumption ratios on Schedule A. They will be discussed in details in Section IV.

FIGURE 5. The AMT Gap by Self-Employment Status (Broad Definition)



We further explore two narrower definitions of self-employment: taxpayers with at least 10 percent of their income/losses from Schedule C, E or F and those with at least 20 percent of their income/loss from Schedule C, E or F. Figure 6 presents a histogram of the self-employed with at least 10 percent of their income from Schedule C, E or F, overlayed by a histogram of the rest of the sample. We observe the similar result that the self-employed appear to act more aggressively to avoid the AMT. Next we define self-employment as having at least 20 percent of one's income from Schedule C, E or F. The overlayed histograms (Figure 7) show the same conclusion as Figures 5 and 6.

FIGURE 6. The AMT Gap by Self-Employment Status (Narrower Definition)

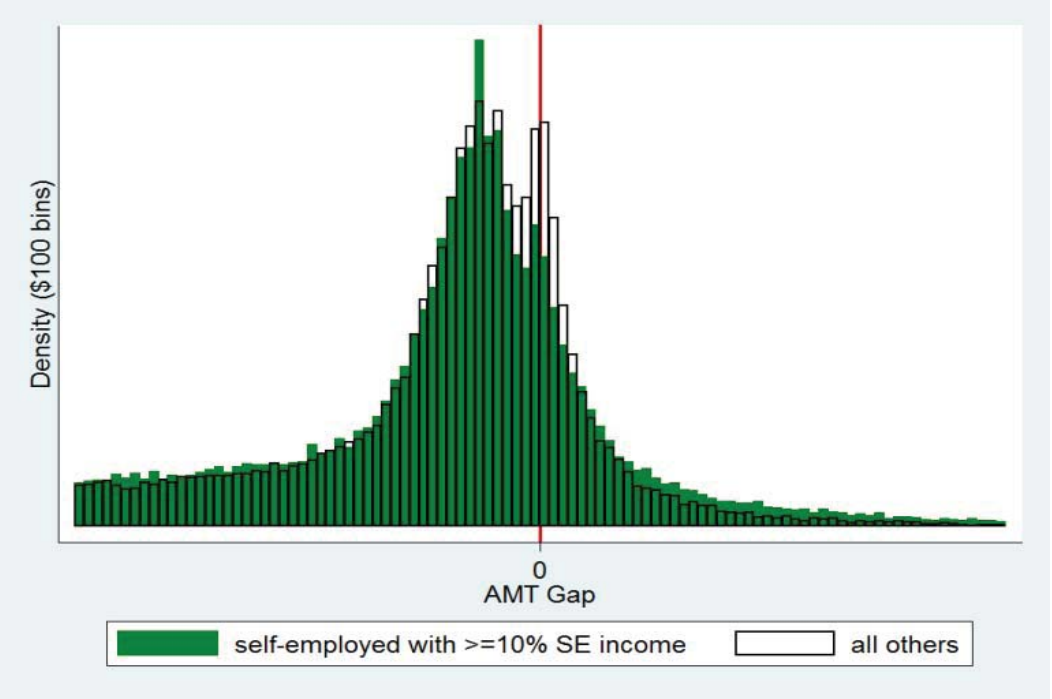
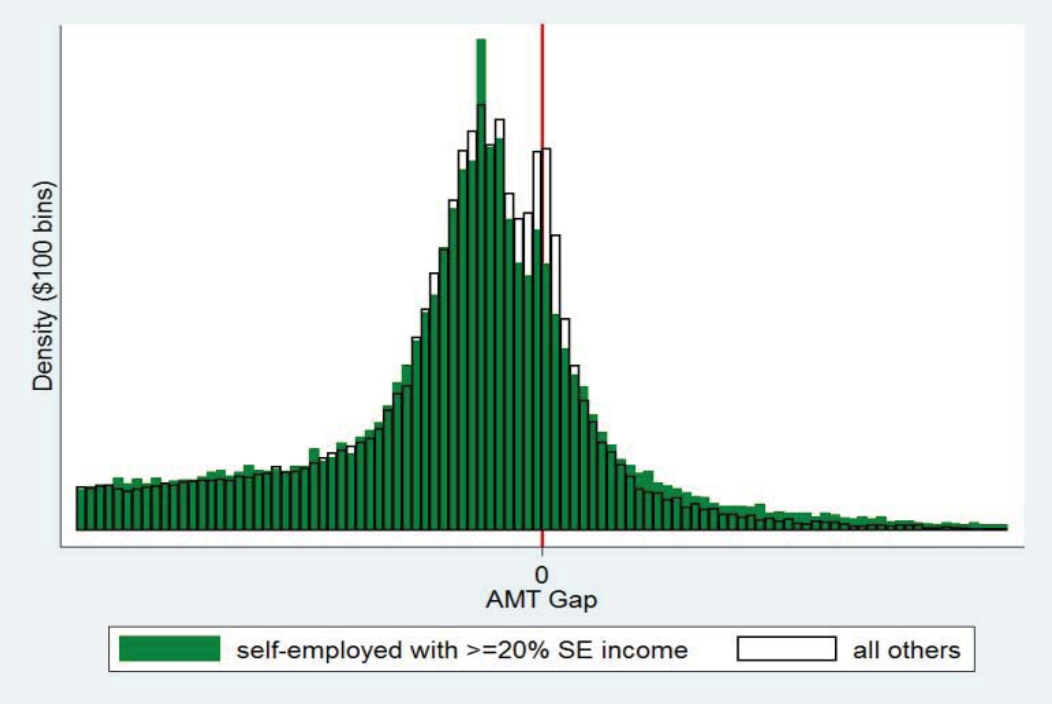


FIGURE 7. The AMT Gap by Self-Employment Status (The Narrowest Definition)



Next we look into comparisons of separate schedule filers (Figures 8–10). The results are similar to previous figures. More mass of the distributions of Schedule C filers, Schedule E filers, and Schedule F filers are located to the left of zero. All three groups have sharper notches than those in the comparison group.

FIGURE 8. The AMT Gap by Self-Employment Status (Schedule C)

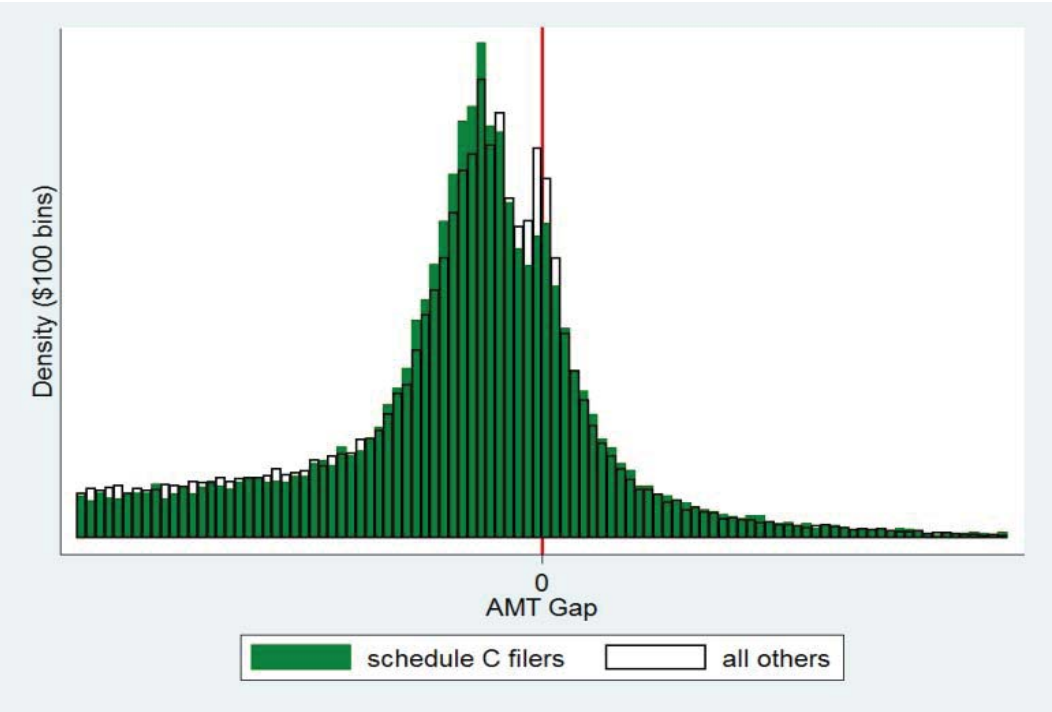


FIGURE 9. The AMT Gap by Self-Employment Status (Schedule E)

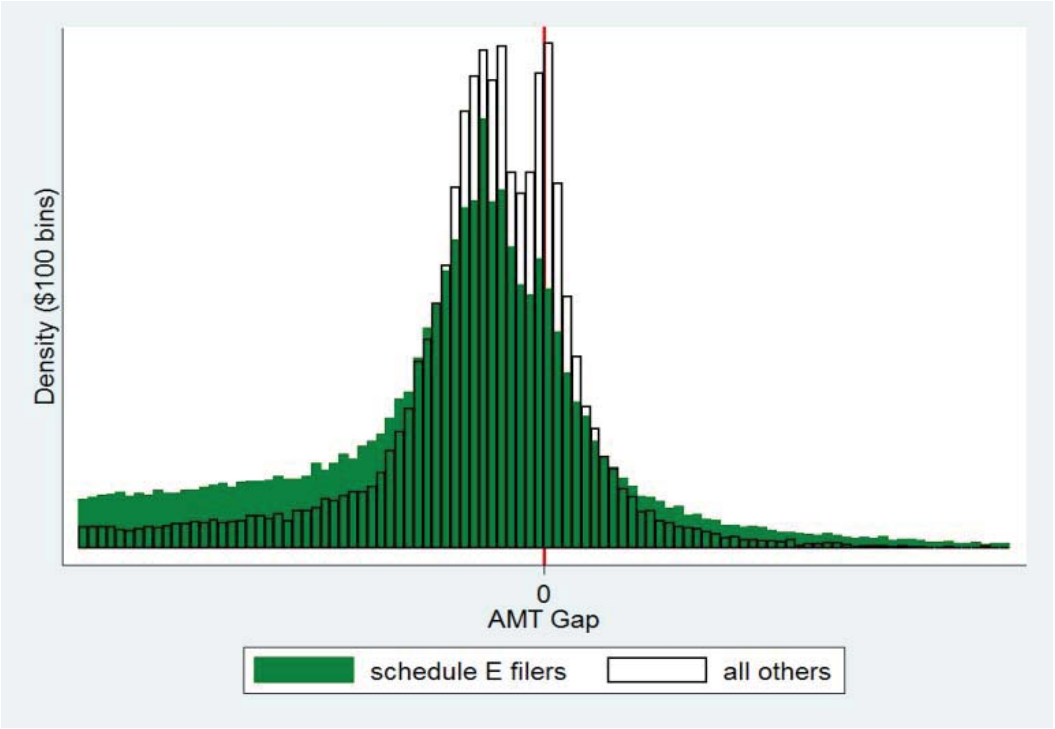
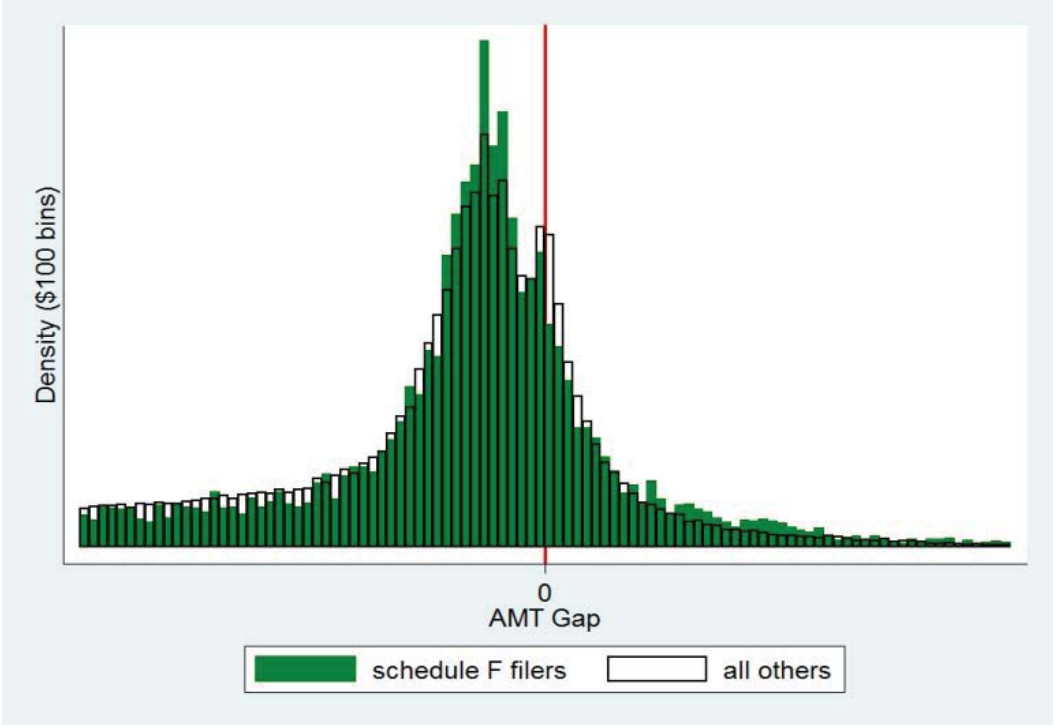


FIGURE 10. The AMT Gap by Self-Employment Status (Schedule F)



There are several explanations to the different behavioral responses between wage earners and the self-employed. On the intensive margin, the self-employed have greater flexibility to choose hours of work and intensity of work. On the extensive margin, they have larger labor supply flexibility (choose whether to work or not) than wage earners. In addition, wage earners and the self-employed might have different tax noncompliance behavior. Earnings from self-employment are easier to underreport to the tax authority (Kuka, 2013). Therefore the self-employed can take more aggressive actions to avoid the AMT. For example, the Schedule C filers can reduce their tax liabilities by overreporting business expenses. Since wage income is third-party reported and therefore difficult to underreport without being detected (Kleven and Waseem, 2011), the bunching in the distribution of wage income may be attributed to real response. However, wage earners could manipulate some of their itemized deductions, so the bunching could also mean some misreporting. We turn to this next.

IV. Misreporting or Real Activity Response?

Given that we have found clear evidence of bunching, the next question is whether it is driven by misreporting or real responses. Pissarides and Weber (1989) pioneered an expenditure-based approach to estimating taxpayer compliance. They estimated food expenditure equations conditional on household characteristics and reported income. The idea is assuming that self-employed households have the same preferences regarding food as wage earners and wage earners truthfully reveal their income, differences by employment status in the estimated relationship between reported income and food expenditures may be attributed to underreporting of income by the self-employed. One key assumption of the PW method is that the reporting of expenditure on some items by all groups is accurate.

Since food consumption information is not available in the tax return data, we creatively look at certain itemized deductions on the Schedule A and treat them as "tax-based consumption" items. Interest paid is one example, and it mainly includes two parts: home mortgage interest paid and investment interest paid. Since both of them are subject to third-party reporting, it is perhaps safe to assume that taxpayers truthfully reveal their consumption on these items. Another consumption item we look at is property tax paid. The analogy of using property tax is similar to the use of interest paid. We also consider charitable donations as one of the consumption items (Feldman and Slemrod, 2007). However, it should be pointed out that charitable donations can be easily manipulated or misreported by taxpayers. We consider all three ratios of tax-based consumption to total income (interest paid ratio, property tax ratio and charitable donations ratio). The summary statistics of three tax-based consumption ratios are in Table 2.The estimated equation is as follows:

$$\ln\left(\frac{C_{i,j}}{\text{Total Income}}\right) = \beta_1 * \text{AMT Gap}_{i,j} + \beta_2 * \text{Self Employed}_{i,j} + \beta_3 * \text{AMT Payers}_{i,j}$$
$$+[\beta_4 * \text{AMT Gap}_{i,j} * \text{Self Employed}_{i,j}] + [\beta_5 * \text{Self Employed}_{i,j} * \text{AMT Payers}_{i,j}]$$
$$+[\beta_6 * \text{AMT Gap}_{i,j} * \text{AMT Payers}_{i,j}]$$
$$+[\beta_7 * \text{AMT Gap}_{i,j} * \text{Self Employed}_{i,j} * \text{AMT Payers}_{i,j}] + \gamma_{i,j} * Z_{i,j} + \text{Year}_j + \varepsilon_{i,j}$$

We use log-level regression to capture the nonlinearity between the AMT gap and the ratios of tax-based consumption to total income. $C_{i,j}$ represents a tax-based consumption item i at year j. As defined in the previous section, ATM $\text{Gap}_{i,j}$ is the difference between a person's AMT and regular tax.[3]

The main interest of this equation is β_1, which captures the relationship between tax-based consumption ratios and the AMT gap. Since it might change once taxpayers cross the AMT threshold, we include a dummy ATM $\text{Payers}_{i,j}$ tion term to allow the effects of the AMT gap to differ between the two sides of the AMT threshold.

To account for the different responses to the AMT gap between the self-employed and wage earners, we include a dummy $\text{Self Employed}_{i,j}$ which equals one if a person has any income/loss from Schedule C, E or F.

[3] If *AMT* $Gap_{i,j}$ is negative, a higher value indicates that a person moves closer to the AMT threshold. If *ATM Gapi,j* is positive, a higher value indicates that a person moves away from the AMT threshold.

In addition, we use the interaction term [ATM $Gap_{i,j}$ * Self $Employed_{i,j}$], which allows the AMT gap to affect consumption ratios differently between the self-employed and wage earners. We use a three-way interaction term [ATM $Gap_{i,j}$ * Self $Employed_{i,j}$ * ATM $Payers_{i,j}$] to capture the effect of AMT gap when a taxpayer is self-employed and pays the AMT. $Z_{i,j}$ represents a series of economic controls, and $Year_j$ is a series of dummies representing the filing year. $\epsilon_{i,i}$ is the error term.

Following a strategy similar to the PW method, we test the following assumption. Consumption on housing is considered a fairly stable portion of one's income. It is unlikely someone would change his housing consumption according to his tax schedule on a yearly basis. A change in housing consumption should be a good indicator that there is a real activity change/labor supply change in this household. Recall that we define the dependent variables as the ratio of one's tax-based consumption (i.e., consumption on housing or charitable donations) to his total income. If there is no misreporting (i.e., only a change in real activity), the ratio should exhibit a stable pattern as individuals get closer to the AMT threshold, all else equal. However, if we observe the ratio changes as one moves closer to the AMT threshold, we can point to that as suggestive evidence that taxpayers manipulate their income according to the tax schedule. The results are presented in Table 3.

TABLE 3. Regression on Response to AMT Gap (All Self-Employed)

Variable	*ln*(Interest Paid Ratio)	*ln*(Property Tax Ratio)	*ln*(Charitable Donation Raio)
AMT_Gap	0.00001***	0.00002***	0.00001***
	0.000003)	(0.000002)	(0.000003)
SE (self–employed)	0.054*	0.031	0.268***
	(0.030)	(0.019)	(0.029)
SE*AMT_Gap	0.000005*	–0.0000008	–0.000007***
	(0.000003)	(0.000002)	(0.000003)
AMT_Payers	–1.417***	–0.902***	–0.865***
	(0.050)	(0.031)	(0.046)
AMT_Payers*AMT_Gap	–0.00003***	–0.00001***	0.000004
	(0.000007)	(0.000004)	(0.000006)
SE*AMT_Payers	0.094*	0.180***	–0.006
	(0.049)	(0.031)	(0.046)
SE*AMT_Payers*AMT_Gap	0.00002**	0.000003	0.00002***
	(0.000007)	(0.000004)	(0.000006)
Marginal Tax Rate	–5.387***	–3.725***	–3.468***
	(0.079)	(0.051)	(0.074)
Total Number of Exemption	0.080***	0.007*	0.060***
	(0.005)	(0.003)	(0.005)
Married and File Jointly	–0.062***	0.048***	0.116***
	(0.018)	(0.011)	(0.016)
Age 65 and Above	–0.694***	0.117***	0.597***
	(0.017)	(0.009)	(0.014)
Sample Size	79,594	89,657	91,037

NOTE: *** , **, * indicate 1% , 5% and 10% statistical significance respectively.

The AMT gap measures the individual specific distance to the point of triggering the AMT. Results show that we reject the null hypothesis that there is no misreporting. As taxpayers move closer to the AMT triggering point, all three ratios of their consumption to income increase. Specifically, when the AMT gap increases by $1,000, the ratio of interest paid to one's income increases approximately by 0.01 percent. The ratio of his property tax paid to total income increases by 0.02 percent and the ratio of his charitable donation to total income increases by 0.01 percent. Once they pass the AMT threshold, the ratio of interest paid to one's total income decreases as they move away from the threshold. These provide suggestive evidence that taxpayers underreport their taxable income to avoid the AMT, especially when they are about to trigger the AMT.

The self-employed start at a higher level of consumption ratio. Their ratio of interest paid to total income is 0.05 percent higher than the wage earners'. The ratio of charitable donations to total income is 0.26 percent higher than the wage earners'. According to the PW theory, if one's source of income is unrelated to his expenditure, any difference in the relationship between the expenditure ratio and the source of income can be attributed to (relative) underreporting by the individual. Our results are suggestive evidence that the self-employed relatively underreport more income or overreport more consumption, compared to wage earners. This is consistent with the findings by previous studies that the self-employed are likely to misreport (Feldman and Slemrod, 2007; Kleven and Waseem, 2011). However, it should be pointed out that it is possible that the self-employed have different preferences over these tax consumptions than do wage earners. For instance, some self-employed people may work at home and therefore prefer to invest more in the house for a larger work space.

We use case studies to better illustrate the difference between the self-employed and wage earners' behaviors. The first case is a wage earner with a 20 percent interest paid ratio and an AMT gap of -$10,000, which means he is $10,000 away from the AMT triggering point. When he moves from -$10,000 to the AMT threshold ($0), his interest paid ratio increases from 20 percent to 20.1 percent. Once he triggers the AMT, his interest paid ratio begins to decrease. If he moves from the AMT threshold ($0) to $10,000, his ratio will decrease from 20.1 percent to 18.4 percent. The second case is a self-employed taxpayer. All else equal, the self-employed who locates at -$10,000 has a slightly higher interest paid ratio (20.054 percent). As he moves from -$10,000 to the AMT threshold, his ratio increases from 20.054 percent to 20.114 percent. Similar to the wage earner, his ratio also begins to decrease after he crosses the trigger point. By calculation, his interest ratio is 18.69 percent when he pays $10,000 of AMT.

To sum up, the self-employed have higher levels of tax-based consumption ratios, but they do not change these ratios as aggressively as is shown in the previous histograms. We attribute this to the following possibilities. Being self-employed gives taxpayers more evasion opportunities. For instance, the taxpayers who file Schedule C could either over-report business expenses or underreport business income on Schedule C. If that is the case, they do not need to aggressively move these three tax-based consumption ratios. To check our hypothesis, we ran the regression on Schedule C filers only (Table 4). The results show that Schedule C filers do increase the ratio of business expense to business income (i.e. gross income on Schedule C) when they move toward the AMT threshold. When they move $1,000 closer to the AMT threshold, their business expense ratios increase by 0.02 percent. This suggests that Schedule C filers try to avoid the AMT either by over-reporting business expenses or by underreporting business income. Once they pass the AMT threshold, there is no effect of further changes in the AMT gap on the business expenditure ratio.

Other controls include the filers' marginal tax rate, total number of exemptions, filing status, and age. Marginal tax rate is the effective federal marginal tax rate. In general, research finds that the tax code creates incentives to consume more housing and to donate (Glaeser and Shapiro, 2003; Feldman and Slemrod, 2007). Contrary to previous literature, we find that a one-percentage-point increase in the marginal tax rate leads to a decrease in the interest paid ratio of 5.387 percent, a decrease in the property tax ratio of 3.725 percent, and a decrease in the charitable donations ratio of 3.468 percent.

TABLE 4. Regression on Response to AMT Gap (Schedule C Filers only)

Variable	*ln*(Business Expense Ratio)
AMT_Gap	0.00002***
	(0.000002)
AMT_Payers	–0.062
	(0.056)
AMT_Gap*AMT_Payers	–0.00002***
	(0.000004)
Marginal Tax Rate	–0.875***
	(0.163)
Total Number of Exemption	0.023**
	(0.010)
Married and File Jointly	–0.145***
	(0.038)
Age 65 and Above	–0.064**
	(0.034)
Sample Size	23,320

NOTE: *** , **, * indicate 1% , 5% and 10% statistical significance respectively.

The coefficient on married and filing jointly taxpayers suggests that married couples have lower ratios of interest paid to their total income. Echoing Feldman and Slemrod (2007), we find evidence that married couples tend to give more than other households. Their ratio of charitable donations to total income is 0.116 percent higher than other filing groups. Our results show that more exemptions lead to higher ratios of all three expenditures to total income. The results are different from what Feldman and Slemrod (2007) found. They found more exemptions are associated with lower levels of charitable donations. Taxpayers who are 65 years old or older tend to have a lower interest paid ratio, but a higher property tax ratio and a charitable donation ratio.

The main regression (Table 3) uses a broad definition of self-employment. To check the robustness of our results, we ran an additional regression with a narrower definition of self-employment. We examined the self-employed with at least 20 percent of their income from Schedule C, E or F. It turns out that the results are robust (Table 5). We observe the same pattern of changes in all three tax-based consumption ratios along the AMT gap.

TABLE 5. Regression on Response to AMT Gap (20% Self-Employment Income)

Variable	*ln*(Interests Paid Ratio)	*ln*(Property Tax Ratio)	*ln*(Charitable Donation Ratio)
AMT_Gap	0.00002***	0.00003***	0.000007***
	(0.000001)	(0.000001)	(0.000001)
SE (self–employed)	0.410***	0.303***	0.405***
	(0.020)	(0.013)	(0.019)
SE*AMT_Gap	–0.000002	–0.000002	–0.000008***
	(0.000002)	(0.000001)	(0.000002)
AMT_Payers	–1.236***	–0.687***	–0.800***
	(0.033)	(0.021)	(0.030)
AMT_Payers*AMT_Gap	–0.00002***	–0.00001***	0.00002***
	(0.000003)	(0.000002)	(0.000003)
SE*AMTC	–0.130***	–0.101***	–0.1000**
	(0.037)	(0.023)	(0.034)
SE*AMT_Payers*AMT_Gap	0.00002***	0.0000003	0.00001***
	(0.000004)	(0.000003)	(0.000004)
Marginal Tax Rate	–5.253***	–3.662***	–3.387***
	(0.079)	(0.050)	(0.074)
Total Number of Exemptions	0.075***	0.003	0.054***
	(0.005)	(0.003)	(0.005)
Married Filing Jointly	–0.061***	0.050***	0.132***
	(0.018)	(0.011)	(0.016)
Age 65 and Above	–0.672***	0.138***	0.632***
	(0.016)	(0.009)	(0.014)
Sample Size	79,594	89,657	91,037

NOTE: *** , **, * indicate 1% , 5% and 10% statistical significance respectively.

Since our sample is a pooled cross-section of data over several years, we ran regressions for each year separately to check if the behavioral responses to the AMT are different across years (Table 6). Overall, the results are robust. We find taxpayers change their interest paid ratio as they move along the AMT gap in most years, except for Years 1994 and 1996. We attribute this to different environments for regular tax and AMT. For instance, in some years AMT parameters were not known until the end of the year. If that is the case, taxpayers can avoid the AMT/reduce their tax liabilities only by misreporting. In contrast, if a taxpayer knows the AMT parameters in advance, he might be able to adjust some of his household consumption or labor supply to avoid triggering the AMT.

TABLE 6. Regressions on Response to AMT Gap (Interest Paid Ratios)

Variable	Year 1994	Year 1995	Year 1996	Year 1997	Year 1998	Year 1999	Year 2000	Year 2001	Year 2002
AMT_Gap	0.00001	0.00002**	0.000004	0.00002*	0.00002**	0.00003***	0.00003***	–0.000003	0.00002***
	(0.00001)	(0.000009)	(0.000007)	(0.000009)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
SE (self–employed)	0.029	0.020	0.133	–0.032	–0.077	–0.051	–0.038	0.251***	–0.112
	(0.121)	(0.104)	(0.071)	(0.106)	(0.111)	(0.108)	(0.095)	(0.064)	(0.087)
SE *AMT_Gap	0.00001	0.00000	0.00001	0.000001	0.000001	–0.00001	–0.00001	0.00002*	–0.0000001
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
AMT_Payers	–1.547***	–1.237***	–1.257***	–1.415***	–1.220***	–0.928***	–1.220***	–1.465***	–1.791***
	(0.206)	(0.201)	(0.149)	(0.209)	(0.212)	(0.195)	(0.166)	(0.100)	(0.109)
AMT_Payers*AMT_Gap	–0.00001	–0.0001***	–0.00003	–0.00005	–0.00004	–0.00005*	–0.00003	0.000001	–0.00003*
	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00002)	(0.00001)	(0.00001)
SE*AMT_Payers	0.327	0.111	0.078	0.139	0.182	0.051	0.097	–0.024	0.179
	(0.203)	(0.196)	(0.143)	(0.207)	(0.208)	(0.190)	(0.159)	(0.104)	(0.109)
SE*AMT_Payers*AMT_Gap	–0.00001	0.00009**	0.00004	0.00005	0.00004	0.00006*	0.00003	–0.00001	0.00002
	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00002)	(0.00001)	(0.00002)
Marginal Tax Rate	–5.006***	–4.914***	–5.017***	–5.375***	–4.875***	–3.920***	–4.876***	–5.858***	–6.043***
	(0.287)	(0.282)	(0.273)	(0.295)	(0.303)	(0.290)	(0.269)	(0.159)	(0.168)
Total Number of Exemptions	0.075***	0.094***	0.053***	0.075***	0.082***	0.115***	0.100***	0.060***	0.079***
	(0.015)	(0.014)	(0.014)	(0.016)	(0.017)	(0.017)	(0.016)	(0.013)	(0.013)
Married Filing Jointly	–0.064	–0.131*	0.003	–0.087	0.037	–0.044	–0.117*	0.022	–0.181***
	(0.056)	(0.055)	(0.054)	(0.060)	(0.060)	(0.059)	(0.054)	(0.045)	(0.046)
Age 65 and Above	–0.771***	–0.731***	–0.617***	–0.891***	–0.744***	–0.696***	–0.678***	–0.568***	–0.648***
	(0.052)	(0.051)	(0.054)	(0.056)	(0.056)	(0.054)	(0.047)	(0.042)	(0.042)
Sample Size	7,684	8,100	8,244	6,913	7,788	8,383	10,172	11,287	11,023

NOTE: *** , **, * indicate 1% , 5% and 10% statistical significance respectively.

V. Discussion and Conclusions

The Alternative Minimum Tax is an important part of the US income tax system. It is an important revenue source for the federal government and affects millions of households every year. Using Public-Use Files from 1994 to 2002, this paper presents for the first time evidence on behavioral responses to the AMT. We find clear and significant behavioral responses to the AMT threshold. The peculiar part of the AMT is that every taxpayer's AMT liability is different. We add to the literature by using the AMT gap concept to plot the behavioral response to the AMT. Specifically, we project each taxpayer's AMT liability based on their tax return and calculate the difference between their AMT liability and regular tax liability (i.e. the AMT gap). The AMT presents a large economic incentive to bunch, and we find that individuals indeed respond. The evidence of bunching is strong, with a statistically significant break in the density of the AMT gap at the notch (as seen by the McCrary test). In addition, we explore the difference between the self-employed and wage earners, and find the self-employed act more aggressively to avoid the AMT. Wage earners also bunch their income around the AMT threshold, which suggests either real activity change (since higher tax rates discourage people from earning income) or misreporting preference items such as itemized deductions.

We further investigate the question of whether such bunching behavior is caused by real responses or just misreporting in tax returns. Following the classic PW method, we take advantage of the relationship between tax-based consumption ratios and the distance to the AMT threshold. We find evidence that taxpayers might underreport their income as they move toward the AMT threshold. The self-employed have more opportunities than wage earners to avoid the AMT. Results from a restricted sample (Schedule C filers only) show that the Schedule C filers are likely to either underreport their business income or over-report their business expenses to avoid the AMT.

Overall, the findings suggest that the bunching created by the AMT comes from both real responses and misreporting. This has important policy implications. First, underreporting among the self-employed suggests revenue losses. Second, evidence suggests that the AMT has an impact on taxpayers' real activity. This real response is what pol-

icy makers need to pay attention to. If people change their activities according the tax schedule, then there is economic distortion to the economy, in addition to tax revenue loss. Future work could continue to explore the causal impact of the AMT on taxpayer's behavioral response if panel data become available.

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