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Critical Analysis of Policy Research
Final Paper

Introduction

In the paper *More Than They Realize: The Income of the Wealthy*, authors Jenny Bourne, et al ask the research question: Do individuals in the US with more wealth realize smaller returns in net capital income? This question has consequences for evaluation of the progressivity of the US tax system. The authors also suggest that income inequality is understated by current estimates, since realized wealthy individuals selectively realize their capital income and taxable capital income.[1] Finally, a proper accounting of capital income realization would help more accurately measure wealth inequality. These are all important implications, given growing unrest in the US over income and wealth inequality, with reports showing America's top 10% earning over nine times as much income as the bottom 90% combined.[2]

To properly understand *More Than they Realize (abv.)*, one must understand some basic public finance terminology. A progressive tax system is one in which an increase in an individual's income results in a greater than proportional increase in marginal tax rate.[3] If an increase in income results in a smaller than proportional increase in marginal tax rates, the system is regressive. This can be shown mathematically by the elasticity of taxes with respect to income, as shown below with taxes as T and income as Y.

$$\frac{dT}{T}\frac{Y}{dY} \qquad (2)$$

Capital assets accrue or gain value as they appreciate. Capital gains are "realized" as income at the time of their sale.[4] Capital income is derived from capital assets (stocks, bonds, real estate, etc.). Compared to non-wealthy individuals, the wealthy hold more capital assets, and thus derive a larger share of their income as capital income. Additionally, long-term capital gains (assets held for 1+ year) are taxed at lower rates than short-term capital gains. Because wealthy individuals can hold their assets for a long-time without concern for short-term risks, they can benefit from this "tax-preferred" status.[5] Investors have the choice of when to realize assets by selling them. Thus, using various aspects of

[1] Bourne, et al. "More Than They Realize: The Income of the Wealthy," 335.
[2] https://www.thebalance.com/income-inequality-in-america-3306190
[3] *Public Finance in Theory and Practice.*
[4] "Capital Gains Tax 101." Investopedia.
[5] Bourne, et al. "More Than They Realize: The Income of the Wealthy," 337.

"aggressive tax planning," individuals can control their total realized returns, measured as a percent change of gains over initial investment.

Description of Data and Methods Used

More Than They Realize's primary innovation is in its analysis of a new IRS form that links returns from Federal Estate Tax (Form 706) with Federal Income Tax (Form 1040). These forms combine net wealth at the time of death (2007) with the past five years of realized capital income (2002-2006), for individuals with at least $2M in net estate.[6] From 36,889 returns, the authors created a stratified sample of 12,296 observations. Sample weights of 100% were used for individuals making over $50M and stratification variables were date of death, size of estate, and age.[7] The authors adjust key dependent variables *net capital income* and *net taxable capital income* by converting the long-term capital gains base to an equivalent dollar figure at the income tax rate.[8] They then generate descriptive statistics and a Multiple Regression Analysis of natural log net wealth on natural log *net capital income* and natural log *net taxable capital income*. From here on, I will refer to both simultaneously as *net [taxable] capital income*.

Summary and Brief Discussion of Primary Findings

Simple descriptive statistics showed that realized returns on net capital income was on average 2-3% for individuals with $2M in net estate.[9] Compare this to the 7-8% average returns on the S&P 500 Index. The authors find this questionable, since we might expect wealthier individuals to be more successful investors on average. While capital gains were shown to have an increasing share of net capital income as wealth increased, net taxable capital income decreased.[10] The regression used was,

$$\ln(\text{net [taxable] capital income}) = b_0 + b_1 \ln(\text{net estate}) + b_2 x_2 + \ldots b_n x_n \qquad (2)$$

Where $x_2 \ldots x_n$ included Age, Age^2, D(always married), D(always single), D(male), D(male*always married), D(male*always single), ln(charitable contribution), home value as a % of net estate,

[6] Bourne, et al. "More Than They Realize: The Income of the Wealthy," 336.
[7] Ibid, 339.
[8] Ibid, 340-342.
[9] Ibid, 336.
[10] Ibid, 334-345.

D(medical), ln(net estate)*D(medical), and D(dependents).[11] Regressions were generated for *both net capital income* and *net taxable capital income*.

Interpreting the coefficient b_1 as the elasticity of net taxable capital income with respect to net estate, the paper found that a 1% increase in net estate corresponds to a 0.8% increase in net taxable capital income (0.93% increase in net taxable capital income).[12] As *net [taxable] capital income* can be used as a proxy for taxation, this shows regressive taxation, according to equation (1). In addition, the paper also found that age, medical expenses, and always single marital status positively increased net taxable capital income.

Overall, the suggested implication of these findings is that "income realized for tax purposes understates economic income" for individuals with increasing wealth. Since realized capital income is less than economic income, the effective tax rates on these earners will be overstated. For instance, if real returns are 7% in the market, but only 2% are realized and taxable, then at a 35% marginal income tax rate, earners will only pay 10% in marginal taxes.[13]

Critical Assessment of Analysis

Overall, *More Than They Realize*, is a very well-qualified paper that is aware of its limitations. For instance, they make some simplifying assumptions and non-considerations:

- That each spouse in a marriage has access to ½ of capital income when filing Form 1040 jointly[14]
- That individuals may still pay other corporate, property, or estate taxes not measurable in the Form 1040[15]
- Excluding estate-tax filers with less than $2M in net estates who showed up in the filing, as they likely did not expect to meet this threshold and did not plan accordingly for the Form 706

In addition to these assumptions, the following three critiques are the strongest of the claims against causality. They include an example of Reverse Causality, Omitted Variable Bias/Missing Data, and Non-Classical Measurement Error.

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[11] Ibid, 350.
[12] Ibid, 351.
[13] Ibid, 352.
[14] Ibid, 342.
[15] Ibid 352.

Critique #1: Reverse Causality – Endogeneity of Net Wealth

The greatest threat to causality in this paper is the endogeneity of net wealth. Fortunately, the authors are aware of this, stating "We interpret our results as descriptive rather than causal, particularly because *net estate* is not exogenous."[16] Stated otherwise, do individuals realize less *net [taxable] capital income* because they are wealthy? Or are people wealthier because they pay less in taxes, proportionally? The argument here is that higher taxes incentivize legal and illegal tax evasion by accrued, rather than realized gains.

Let us consider the effect of potential reverse causality on the paper's primary regression, equation (2). Examine the following reverse causality data-generating process,

$$\ln(\text{net wealth}) = c_0 + c_1 \ln(\text{net [taxable] capital income}) + c_2 \ldots c_n + v_i$$

For purposes of this critique, we assume that a smaller amount of *net [taxable] capital income* results in greater wealth, holding all other factors constant. Since individuals are realizing less in taxable earnings, yet still assuming unrealized earnings constant, the sign of c_1 is negative. However, it should be noted that this introduces a new instance of omitted variable bias, since the current regression does not guarantee that net economic income is held constant. This data is not available. It is likely that without holding all earnings constant, an increase in net taxable capital income will reflect an *increase* in wealth. Thus, the following sign estimation makes a simplifying assumption that economic income is held constant, and indeed c_1 is negative.

Because b_1 from equation (2) implies c_1, a negative c_1 suggests that the paper is negatively biased (downward). The true correlation between net wealth and realized capital income is larger than the observed values of 0.79 and 0.93 for net capital income and net taxable capital income. In other words, the rich may realize more taxable income proportionally to wealth and is more progressive than stated.

While the authors openly claim this threat to causality and declare only descriptive results, we will still assume the paper proposes causality for the purposes of the following two critiques.

[16] Ibid, 349.

Critique #2: Omitted Variable Bias – Fixed Effects for the economy over time

While the paper controlled well for many time-relevant factors on the individual level, the paper does not control for time-based fixed effects in the macro economy. This is due to limited data – the available IRS forms are for the years 2002-2007. The authors suggest that these are convenient years since it is right before the Great Recession, when spending habits might decrease. The authors mention that they could have controlled for individual-level time-based effects, as certain individuals may have accrued or declined in wealth over the time period. However, they do not address the question of group-level time-based effects.[17]

Whether in a good economy such as that of pre-2007, or during a recession, I suggest that such trends could be controlled for with a currently omitted fixed effects variable, $economy_t$. This variable would capture the year-to-year effects of economic boom or bust, which could have implications for capital income realized, but also for the size of the net estate.

Note that to estimate the sign of omitted variable bias, we need to know the sign of the correlation coefficient of the omitted variable in the data-generating process (b_2), as well as its correlation with the coefficient with the variable(s) included in the estimation equation ($corr(x_{1i}, x_{2i})$).[18] Additionally note that omitting fixed effects will bias the slope of the regression (see graph below). The intercept of the true relationship will then vary based on the state of the economy in that time period. Because we only have data for 2002-2007, we can assume that if we were to correct this omitted variable bias issue, we would still have an intercept bias, as data is missing from other time periods.

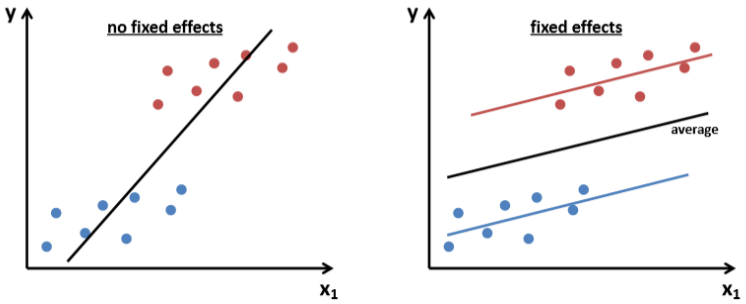

Figure 1: No Fixed Effects vs. Fixed Effects (Professor Kovak's Lecture "Interpreting Regressions (Part 2)", slide 28)

[17] Ibid, 346.
[18] Professor Kovak's Lecture on Omitted Variable Bias and Reverse Causality, Slide 8.

Let's first focus on the size of the net estate, as it is the independent variable (ignoring endogeneity from Critique #1). During a weak economy, wealth will accrue at a slower rate. Vice versa, in a good economy, wealth will accrue faster. In both cases, the average effect of $economy_t$ is positively correlated with net wealth.

Secondly, what is the effect of a good vs. bad economy on realized capital income? Compelling arguments could be made for either direction. For instance, wealthy individuals may prefer to realize more capital income in a recession, as this is the time to buy low while everyone else is getting out of the market. This would result in a negative relationship between $economy_t$ and realized capital income. But it is also possible that wealthy individuals might realize less capital income during a recession to maintain their wealth and realize more in a good economy while wealth is growing. Assuming the former, a negative relationship between $economy_t$ and realized income, combined with the positive correlation between $economy_t$ and net wealth, the paper's regression is negatively biased downwards in its estimation of wealth's effect on realized capital income, weakening the paper's claim. Based on this analysis, the lack of data for bad economy years would exacerbate this trend.

Critique #3: Non-Classical Measurement Error—Evasive Wealth

While this study was designed to account for legal tax avoidance through self-reported capital income realization, wealthy individuals are known to hold offshore accounts and participate in illegal tax evasion. For instance, in 2007, the "Birkenfeld Disclosure" case revealed that up to 10,000 wealthy US clients were storing up to $15 billion in Swiss Banks.[19] This would account for 6.5% of reported net estate in 2007.[20] In cases like this, if the estate owner dies, this wealth will not be reported in the Federal Estate Tax (Form 706). If the wealth is not officially on the record, then the associated capital income will surely not be reported either. However only the wealth reporting will affect the paper's conclusions, since the author's concern is with *realized* (already reported) capital income, as a measure of known vs. unknown returns on investment.

Suppose we believe that as one gets wealthier, they are more likely to have tax-evasive assets. This would result in a non-classical measurement error where the given values for wealth are understated, as wealth increases. See the graph below, which shows a hypothetical regression with net

[19] Fletcher, Pascal. "UBS, U.S. Settle Tax Evasion Case."
[20] Bourne, et al. "More Than They Realize: The Income of the Wealthy," 339.

wealth on the x_1 axis and net [taxable] capital income on the y axis. The observed relationship is in blue. Added red points represent a shift of each blue point to the right, to show an increase in true wealth, beyond that which is stated on the estate tax form. Due to the assumption above that wealthier individuals have more wealth in evasive shelters, red points are moved increasingly to the right as wealth increases. The red line shows the true relationship, given these assumptions about non-classical measurement error.

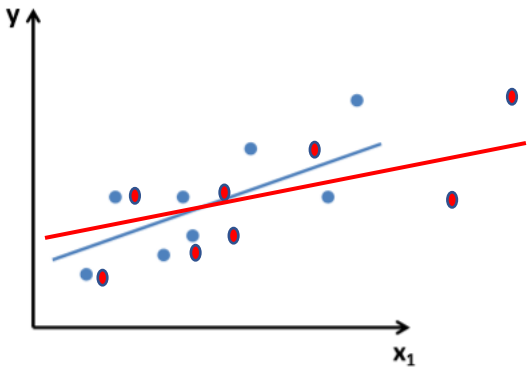

Figure 2: Hypothetical Non-Classical Measurement Error, generated using Kovak's hypothetical points

Given these assumptions, the true relationship of increasingly evasive wealth would result in a positive bias in the current regression. That is, the correlation coefficient for the effect of net wealth on realized capital income should be even lower – an increase in wealth has an even smaller proportional amount of taxable income increase.

Conclusion

The main thread throughout these critiques is that measuring the realized rates of return on investment for wealthy individuals is inherently difficult due to missing data. As stated in critique #1, the authors qualify their research as descriptive, due to endogeneity concerns. As the negative bias stated in critiques #1 and #2 oppose the positive bias in #3, the question arises as to which biases are stronger. Given the incentives to minimize losses in a bad economy and maximize gains through evasive tax purposes, I would speculate that critique #3 has a stronger bias than #2. However, it would be difficult to estimate the magnitude of #1. Ultimately, this paper succeeds for its public policy goals, as causality is not required to prove that 1) our tax system may be less progressive than estimated and 2) estimates relying on realized capital income underestimate income and wealth inequality.

Citations

Bourne, Jenny, Eugene Steuerle, Brian Raub, Joseph Newcomb, and Ellen Steele. “More Than They Realize: The Income of the Wealthy.” *National Tax Journal* 71, no. 2 (January 2018): 335–56. https://doi.org/10.17310/ntj.2018.2.05.

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Professor Kovak’s Lectures on Omitted Variables and Reverse Causality, slide 14

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