The Preferential Tax Rate on Capital Gains and its Impact on Income Inequality

by

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The Preferential Tax Rate On Capital Gains and its Impact on Income Inequality

In light of the global financial crisis of the late 2000's and the recession that followed, a lot of attention has been drawn to the seemingly vast division of wealth and influence between the elite investment bankers who caused the mess on Wall St., and the average Joe Taxpayer who cleaned it up on Main St. Amidst a record number of foreclosures and a skyrocketing unemployment rate, the perpetrators at the nation’s top investment firms rewarded their excessive risk taking with huge bonuses. Income inequality is a major issue in the United States, and the reality of the vast prosperity divide is evident in the extremely intelligent and risk hungry vultures who managed to extract immense wealth from the wholesale rip-off of the rest of the economy.

There are many people who would disagree with this characterization, and indeed some think tanks like the prestigious Cato Institute even assert that rising income inequality is a myth (Reynolds, 2007). While the exact trends in historical inequality may be in dispute, the existence of this inequality is not, and I propose a major contributing factor is the preferential tax treatment for the realization of capital gains. Ever since congress classified capital gains as a distinct form of taxable income in 1913, there has been considerable debate as to what the optimal tax rate should be (Hungerford, 2010). It remains an unsolved research issue today (Boadway, Marchand & Pestieau, 2000), with proponents of lowering or eliminating the tax touting its market efficiency benefits and opponents stressing wealth distribution concerns (Feenberg & Summers, 1990).

In this paper I analyze the economic effects of the capital gains tax, and try to assess the validity of the myriad claims for and against the preferential tax treatment of capital gains over ordinary wage income. Furthermore, I develop a model which seeks to assess the magnitude of the inequality gap which can be attributed to the historically preferential tax status of capital gains income in relation to ordinary income. Using IRS statistical samples of individual tax returns for a number of years augmented with data from the Congressional Budget Office, I plan to demonstrate the association of the 15% maximum statutory tax rate on capital gains with the widening income inequality in the United States. The hypothesis is that over the course of history, there would be an income distributional effect towards equity if the capital gains rate married the much higher top marginal tax rate of ordinary income. I predict this because the vast majority of income from capital gains is realized by the richest members of society, and they are consequently the biggest beneficiaries of
the preferential tax treatment (Feenberg & Summers, 1990)\(^7\) & (Zodrow, 1995)\(^9\). Consequently, eliminating this preference would reduce income inequality.

There are several problems analyses of this type are subject to, the most notorious one being the inability to account for behavioral distortions caused by changes in tax law. For instance, while I may be able to calculate the tax revenue associated with differing tax rates for the same realized gain, there’s no way to know for certain how people would alter their rate of realizations in response to the law. Promisingly, many studies have been done to try and model the elasticity of capital gains realizations with regards to the changing tax rate. The less elastic this relationship is, the less associated changing levels of realizations are with evolving tax policy. In other words, my analysis results are robust only insomuch as the realization/tax rate relationship is inelastic, because that implies the unobservable and hard to model behavioral changes have minimal impact.

This paper will first briefly overview the history of the capital gains tax in the United States, put the seriousness of income inequality into context. Next I will examine research surrounding the debate on the optimal taxation rate, and the validity of the assertions made by proponents and opponents for lowering or eliminating the tax from an economic efficiency standpoint. Then I will review research more central to my analysis about how the tax rate is associated with income distribution issues, as I hope to show it is. For the analysis portion I will compile IRS data using a formula which translates it into a more flexible form, and lastly discuss my conclusion in light of the many studies done correlating change in capital gains tax policy and behavior.

\textbf{A Brief History of Income Inequality in the United States}

\textbf{FROM EISENHOWER TO REAGAN}

In the 1950’s, President Eisenhower enacted the highest marginal tax rate on ordinary income our country has ever faced: a staggering 91\% (Krugman, 2007)\(^{35}\). “Ordinary income” is hereafter referred to as the labor income derived from cash wages and salaries, and the top marginal tax bracket is the rate reserved for the highest class of income earners. For a while this had a redistributive effect on wealth, but over the decades the top marginal tax rate has steadily fallen. A major shift in tax policy came during the 80’s with Ronald Reagan’s “trickle-down” theory of economics, and his efforts shifted a large share of the tax burden away from investment income and on to ordinary wage income (Collins, 2009)\(^6\). The idea behind Reagan’s trickle-down policy, also known as
Reaganomics, is simple—by reducing taxes and regulatory burdens for businesses and the people who operate them, general prosperity will indirectly benefit everyone in the economy via an increase in GDP growth (Niskanen, 1993)\textsuperscript{38}. During his tenure Reagan passed two important pieces of legislation: the \textit{Economic Recovery Tax Act of 1981}, and the \textit{Tax Reform Act of 1986}.

Both laws reduced taxes across the board, but disproportionately so. For instance, in 1981 the top marginal tax rate was reduced by 50%, while the lowest marginal tax rate was reduced by only 4% (TPC: 80s Legislation)\textsuperscript{18}. In 1986 the top rate was reduced a further 22%, but the earlier 4% reduction for the poorest Americans was repealed (TPC: 80s Legislation)\textsuperscript{18}. An interesting thing to note, however, is that Reagan specifically sought to close the preferential tax treatment of capital gains (Garson)\textsuperscript{10}. In his later bill, Reagan equalized the top marginal tax for both labor and capital gains, saying “By closing loopholes and lowering rates, we’re going to bring America’s investment money out from under the shelters and back into the productive economy where it belongs” (Baker, 1995)\textsuperscript{1}.

Besides the eight years following 1913, this was the only time in U.S. history that capital gains and labor income were taxed at the same rate (TPC: Historical Rates, 2011)\textsuperscript{13}. While Reagan did indeed lower taxes for everybody, the benefits were far from equal; most of the tax breaks for wage income went to the highest income bracket, and the 30% lower capital gains rate naturally benefitted those same people who incidentally hold 80% of the stock market wealth (Mishel, Bernstein & Shierholz, 2009)\textsuperscript{21}.

**REAGAN’S LEGACY AND THE SITUATION TODAY**

Reagan’s decade was significant because it marked the beginning of an overall trend that continued late into the 2000’s—the lowering of tax rates whose benefits accrue disproportionately to the wealthy. The Economic Mobility Project, a collaborative effort of the American Enterprise Institute, the Heritage Foundation, the Brookings Institution and the Urban Institute, studied how easy it was for individuals to move up or down the income ladder through generations (Sawhill & Morton)\textsuperscript{26}. Some of the Project’s findings show how inequality started to take shape: While the richest 1% of Americans by earnings saw their after-tax income rise 176% in the 25 years between 1979 and 2004, the income of the poorest 20% only rose by 9% (Sawhill & Morton)\textsuperscript{26}. Continuing in Reagan’s footsteps, President Clinton’s \textit{Tax Reform Act of 1997} further reduced the capital gains rate from 28% to 20% (Collins, 2009)\textsuperscript{6}.
Later, two major laws were passed during the Bush administration that further lowered taxes, but virtually all the benefits were conferred on the rich. The estate tax—a tax on the transfer of inheritance after death—was reduced by 18% while the threshold needed to trigger it was raised over 200% (TPC: Recent Legislation, 2010). Because the super wealthy are at the highest risk of incurring this tax, reducing its impact mostly benefits the aforementioned. Furthermore, the capital gains tax was reduced to 5%, while the tax on dividend income was reduced to 15% (TPC: Recent Legislation, 2010). A report by the Tax Policy Center, a joint effort of the Urban Institute and the Brookings Institution, found that during the period of 2001-2006, the tax benefit received was directly proportional (and positively correlated) to how much income one had in the first place (Rohaly & Leiserson, 2008). For instance, the top .1% highest income earners saw their after-tax income rise by over 8% as result of the legislation, while a miniscule .7% increase was doled out to the poorest fifth of income earners (Rohaly & Leiserson, 2008). It is clear that various tax policies have contributed to income inequality, but the exact amount is hard to say.

Using after-tax income as a yardstick for generational inequality poses some problems. For instance, the dozens of tax laws passed in the last 30 years have dramatically altered the inequality landscape with the stroke of a pen—simply by redefining certain terms and tabulating income in different ways. The way income has been measured by the IRS has changed over the years as well, like in 1984 (Reynolds, 2007). However, the fact that tax legislation changes income so easily “on paper” is exactly why the tax on capital gains needs to be studied.

Over the past two decades the top 10% wealthiest Americans by income have almost consistently controlled 80% of all stock market wealth, and in 2004 owned 46% of all housing equity (Mishel, Bernstein & Shierholz, 2009). According to the IRS, capital gains are the net gains on the sale of property held for personal use or investment, such as a house or an ownership interest in a corporation by shares of common stock (SOI Bulletin, 2011). For almost the entire history of the capital gains classification, it has had preferential tax status with lower rates than those levied on ordinary wage income. In light of this, some people argue whether income inequality has been generated in result, and arguments for how lower capital gains taxes supposedly benefit the economy abound. The next section will take a critical look at one of the defenders of lowering the capital gains tax and some responses.

1. See Figure 02, p. 23
Alan Reynolds and the Income Inequality Controversy

The public debate controversy surrounding the capital gains tax is always viewed behind the magnifying glass of personal bias, and one's normative opinions about what taxes ought to accomplish make the debate a lively one. Those who advocate the tax being raised mostly do so on equity grounds, the assumption being that taxing capital gains like ordinary income will have a redistributive effect aiding the less affluent (Feenberg & Summers, 1990). But what about the very foundation underpinning the rationalization of redistribution? While most economists may argue that rising income inequality isn't just grounds for eliminating the preferential capital gains tax rate, some economists propose that rising income inequality isn't even happening at all. This section will analyze some claims and counterclaims offered in the controversy about whether an increasing income disparity is reality—proponents of a higher tax rate would be seriously handicapped if it weren't.

HIS REPORT AND THE ISSUES IT RAISES

In 2007 Alan Reynolds, a senior fellow at the Cato Institute, released a report critiquing numerous data sets on which the popular income inequality statistics are usually based on (Reynolds, 2007). Reynolds’ main point is that income tax returns are not a viable source for measuring income inequality, because the various changes in tax law have introduced many unobserved or observed but not accounted for variables to the overall income picture, making the data unreliable for calculating income inequality over time (Reynolds, 2007). For instance, if the purpose is to study the changing real incomes of different individuals over time, there must be some way to control for the fact that while changing tax laws may affect how nominal income is reported on paper, it doesn't necessarily reflect changes in real income. If lawmakers pass a bill lowering taxes across the board for example, it a large increase in after-tax income would necessarily follow. This income increase would be a by-product of the stroke of the president’s pen, but it wouldn't accurately describe the changing affluence of different segments of society. Reynolds’ first main issue is that because tax laws distort the income reported on IRS tax returns, and because different segments of the population respond differently to the same tax law in terms of their income reporting, “studies based on tax return data provide highly misleading comparisons of changes to the US income distribution” (Reynolds, 2007).
The main academic work that Reynolds targets for his analysis is a “widely received” 2001 study from Thomas Piketty of the Paris School of Economics, and Emmanuel Saez of U.C. Berkeley. Their study used data from IRS individual tax returns, which Reynolds points out many problems with (Reynolds, 2007)\textsuperscript{22}.

**Behavioral Implications of Classifying Income**

One seemingly big problem is the numerous ways in which income is classified by the IRS. If tax legislation increases the burden on reporting income in one category, individuals will likely use accounting tricks to finesse their income into more preferential forms. For example, in years where taxes on ordinary wages are less burdensome than on corporate income, those individuals owning corporations might restructure their business in a manner such to allow corporate earnings be reported as “individual” income taxable at the preferential rate (Reynolds, 2007)\textsuperscript{22}. The idea is this: suppose some person owns a business generating $100,000 in annual income. That income technically accrues to the business owner, but depending on how the business was incorporated, that income may be taxed a separate form as “corporate” income, or on the standard individual tax return of the business owner. Because tax legislation may change the effective rate on these different categories independently, in some years it might be beneficial to reincorporate a business to shift income back and forth between different tax categories, manipulating the reported income but not actually affecting real income.

An initial reaction to this might be that while it is true changing laws will cause people to shift around or conceal their income in unobservable ways, a true measure of income inequality should include all sources of income from the beginning. If corporate income ultimately makes it into some person’s pocket anyway, than a true standard of living measurement should include it from the beginning. In other words, a true representation of some person’s income should include both their ordinary income, their corporate income, dividend income, et cetera, so it won’t matter that it is difficult to model some person’s creative tax evasion strategies. Reynolds makes other related claims about how some employees might prefer stock options to ordinary wages one year, or the opposite some other year depending on the tax picture (Reynolds, 2007)\textsuperscript{22}. All of these issues Reynolds raises are non-issues if one takes into account every possible source of income reportable, and just focus on the net amount that ends up as cash-in-pocket. The Congressional Budget Office
has recognized these problems and tried to incorporate solutions into their own definitions of income, and they still suggest that income inequality is rising (Burtless, 2007).

**IRS Income Definition Incomplete**

Another major point Reynolds has with the IRS data is that deriving income inequality measurements from it doesn't capture the fact that a growing number of ordinary non-rich people are accruing their savings in “401(k)’s, IRAs, and 529 college savings plans” that have preferential tax treatment and aren't recorded on the individual tax returns as income. One response to this is that in the same way unrealized gains aren’t taxed simply for accruing money that you can’t yet use, it wouldn't make sense to count the money in retirement accounts as ordinary income for the sake of income inequality comparisons. While it’s indisputable that money in these tax deferred “ghost” accounts are hidden from the individual tax return's definition of “income”, it's not so clear that this income is significant to help Reynolds’ case. If we're trying to use income inequality as a gauge for a differing quality of life, than it wouldn't make sense to count unrealized income that can’t directly be used by its holder. Because money in 401(k)'s can’t be used to buy groceries, for example, they can’t be used to increase a person's standard of living on a day to day basis. Usually this money is locked for a long period of time, so it only makes sense to count it when individuals actually hit retirement and start to use it. The difference between unrealized and realized capital gains works the same way, and the IRS only comes knocking after the equities are sold.

Unrealized capital gains are the profits or loss defined by the difference in asset price in the present and when it was first purchased, if the asset were to be sold now (Investopedia). Actually selling the asset “realizes” the gains, and that signifies cash that can be spent. Basically, his point that there is unobserved income “hidden away” from these inequality calculations that leads a lot of middle income people to look poorer than they really are, but my response is that this doesn't matter because that income can't be used for a long time until retirement. It's worth noting however that this is likely very naïve reasoning on my part, because the comprehensive definition of income from the CBO does actually include all these “hidden” sources of income as well.

**My Take on the Hidden Capital Gains Problem**

If your house has gone up $100,000 in the 10 years since it was first purchased, these “gains” are unrealized because they exist only in concept. Once you actually sell your house, those proceeds
are real and they become the realized gains. It wouldn't make sense to count the rising value of your house as “income” for purposes of economic inequality, because this income isn't something that you can tap into on a daily basis to improve your standard of life. However, when you do eventually sell your house that certainly becomes income in your pocket and should be counted.

Likewise, Reynolds’ concerns about tax deferred accounts of middle to lower class people not being counted in the IRS returns are unfounded because that would be akin to counting unrealized gain. Furthermore, even if we did count these sources of income, the measures of income inequality would be even greater (Burtless, 2007) & (Thoma, 2007). For example, according to the Federal Reserve’s Survey of Consumer Finances (SCF) from 2001 and 2004, not only do the bottom 90% of the income distribution hold an insignificantly small portion of all retirement assets, but their increase has been slower as well compared to the top 10% (Thoma, 2007).

The median value of retirement assets for the bottom 90% of the income distribution was approximately $13,000 in 2001 and $15,000 in 2004 [a 15% increase], while the median value of the retirement assets of the top 10% was approximately $138,500 in 2001 and $182,700 in 2004 [a 32% increase]… The basic point is that most Americans have so little capital income that exactly how you count it is not an important issue. (Thoma, 2007)

The same visualization is apparent when using the most recent SCF from 2007: of the poorest 60% income earners—which certainly speaks for the middle and lower classes—only about 10% of their total assets were stored in retirement accounts. Correcting this omission certainly would not add a substantial amount of “poor” income to calculations of inequality (Hungerford, 2010).

REYNOLDS’ SUGGESTED CORRECTIONS AND RESPONSES

One interesting segment in Reynolds’ analysis is where he creates tables comparing the income share of the top 1% using data sets that he criticizes, alongside the same data with his suggested adjustments applied. His point is to show that after making his adjustments to correct the “flaws” in the data that give misleading representations of income, the actual changes of income over the decades are insignificant. For example, in Table 2 Reynolds shows that the original unadjusted Piketty & Saez estimates indicate the income of the top 1% increased from 9.1% in 1986 to 16.1%.

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1. See General Appendix for “Hidden Unrealized Gain”
2. Throughout this paper I use subjective words like “the rich” or “non-rich”, and I put them in quotes. The exact meaning of these words can be substituted with the reader’s own intuitions, but the general concepts I convey should be clear regardless.
in 2004. This would indicate a 7% increase; a number that Reynolds concludes would certainly be significant. In Table 3 he takes that flawed data and makes various adjustments to it—such as including welfare payments—which decreases the apparent disparity from 7% to 5%. In the last column of this table the idea is taken further and Reynolds adjusts the data to include both welfare payments as well as excluding business income which decreases the apparent disparity from 7% to 2.5%\(^1\). The takeaway message is that by including his adjustments, income inequality has only increased by 2.5% compared to the lying 7.5%. Piketty & Saez responded to this criticism in a follow-up essay by saying:

> Reynolds points out that transfers have increased since 1980 but taxes on high incomes have decreased substantially. Actually, we have estimated that... the decrease in taxes at the top outweighs the increase in transfers at the bottom. Therefore, the top 1% disposable income share has most likely more than doubled since 1980.

(Piketty & Saez, 2006)\(^2\)

While including transfer payments\(^2\) is certainly a valid consideration, not including business income isn't. It's no wonder there is a negligible increase in the top 1% share of income earners after excluding a major source of those peoples' income for no good reason (Reynolds, 2007)\(^3\). As Gary Burtless succulently wrote, “Using the same line of reasoning you could also argue that, adjusting for the weather and the season, no homeowner in New Orleans ended up with a wet basement in August 2005. It might be true, but it's not much comforts to the residents who had to flee a flooded home” (Burtless, 2007)\(^4\).

In Piketty and Saez’s response to Reynolds, they state how “Reynolds points out that reported incomes may not reflect true incomes because of tax evasion or tax avoidance. This is a legitimate concern and we, along with a number of colleagues, have actually spent substantial time investigating”. The Congressional Budget Office has as well, and they have developed a definition of income that corrects a lot of the criticisms Reynolds has, by including not only transfers but also all sources of business income, nixing the issue of S-corporations and C-corporations. By accounting for it all, there is no place to hide\(^3\). This data also shows a substantial increase in income inequality, as I’ll make clear with graphs later on. Reynolds’ article was surprising because it seems there is a broad

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1. See General Appendix for Reynolds’ Figure 3
2. Another name for welfare payments, because welfare basically transfers money from some taxpayers to others. Also, take note that the CBO definition of income I lean on later takes this into account.
3. Cayman Islands notwithstanding
consensus that income inequality is rising. Federal Reserve chairman Ben Bernanke had this to say, for example:

\[
\text{Although average economic well-being has increased considerably over time, the degree of inequality in economic outcomes has increased as well. Importantly, rising inequality is not a recent development but has been evident for at least three decades, if not longer.}
\]

(Thoma, 2007)\(^\text{27}\)

Even George Bush, some person who Reynolds would likely respect a lot more than an economist appointed under a liberal president, said this in 2007 remarks to Wall Street: “The fact is that income inequality is real—it’s been rising for more than 25 years” (Sawhill & Morton)\(^\text{26}\).

\textit{Literature Review: The Economic Effects of the Capital Gains Rate}

The two main camps in this arena are those who argue the separate and lower capital gains rate is a driver of inequality, and those who argue that the rate is an economic inefficiency arbitrarily dampening economic growth and prosperity. This section looks at a number of points brought up by a variety of people.

\textbf{PIONEERING RESEARCH}

\textit{Feldstein, Slemrod, and Yitzhaki’s Tax Lowering Study}

Probably the foremost research effort in quantifying the effects of the capital gains tax came out of a 1978 Harvard study conducted on behalf of the National Bureau of Economic Analysis (NBER) that was commissioned by the US. Treasury, which was interested in the potential impact of tax change proposals being discussed at the time. This early econometric analysis concluded that “reducing the tax on capital gains would not only encourage a more active market in corporate stock but would also increase tax revenue” (Feldstein, Slemrod & Yitzhaki, 1980)\(^\text{8}\). This would essentially be a win-win situation for the economy and the IRS, because their estimates indicated that not only would a lower tax rate encourage capital investment helping the economy to grow, but this effect would be so great that the revenues generated from taxing the extra realizations would outweigh the reduction in the rate itself. Recognizing the infancy of their capital gains research at the time, they conclude that “…a more complete model… would be an important extension of the current analysis” (Feldstein, Slemrod & Yitzhaki, 1980)\(^\text{8}\).

More complete models have indeed come to fruition in the last 30 years, and a lot of them build off
of the same theme. It turns out in 1978 after the NBER presented its work to Congress not to imply this was the cause, the maximum rate on capital gains was reduced.

*A Follow-up with Bruce Bartlett*

Bruce Bartlett wrote in a 1985 Financial Analysts Journal article that “the capital gains tax cuts of 1978 and 1981 improved the ability of firms to raise funds through equity offerings” (Bartlett, 1985). Bartlett was able to confirm the predictions of the earlier paper by drawing on updated Treasury and Federal Reserve data which showed that the market value of corporate equities had increased 46%. In addition, tax revenues had increased by $3Bn despite the lower rate. This would seem to indicate no downfall associated with lowering the capital gains rate (Bartlett, 1985).

Some important things that need to be taken into consideration, of course, are how much of those tax gains were actually attributed to the legislation itself. Did the same number of investors suddenly decide to buy more corporate stock because the tax rate was lowered, or were more people simply deciding to invest money for any multitude of reasons that aren’t measurable? The point is, this is a fine example of how it’s hard to determine how people’s behavior changes as a result of a change in tax law. Determining after the fact how correlated the market behavior was to the event in question is something that has been perplexing economists, and this issue was consequently explored heavily in academia in the years after this report which will be reviewed here in a later section. Nevertheless, we can say unequivocally that both tax revenues and market equity value increased in the few years after the law took hold. Bartlett summarizes the positive effects by saying, “even if the tax cut does not result in increased capital gains tax revenues, total tax revenues should rise as the tax cut stimulates investment, creating higher profits and larger payrolls” (Bartlett, 1985). The implication here is that everyone in society benefits—even those who don’t participate directly—because growing corporations will hire more workers and everyone’s salary rises as well. The take home message that everyone in favor of a lower tax rate stresses is that it if it’s good for business, it’s good for you.

**Later Studies About Capital Distribution**

Appeals to Joe the Investor will point out how more than 50% of all Americans hold equities affected by the capital gains law, including pension funds, 401(k)s, and Roth IRA’s (Reynolds, 2007). Real dollars real dollars, as opposed to nominal dollars, are indexed for inflation from the historical date the present date is being compared to in the 5 years after the legislation passed.
Newt Gingrich, then speaker of the house, had this to say in his keynote speech to the 1998 Cato Institute Policy forum:

> Our core message [as Republicans] is very simple: Cutting the capital gains tax rate helps anyone who is preparing for retirement, starting a business, saving for college tuition, or planning to buy a house. The lower the capital gains tax rate, the better off society is

(Gingrich, 1998)\(^{11}\)

These populist appeals to Middle America are mostly a red herring: while the amount of Americans holding capital assets is indeed large by number, the distribution of those holdings is very highly concentrated into a small slice of the population at the very top. A wide palette of research has demonstrated this to be true.

**Who Really Benefits? Research by Feenberg and Summers**

A 1990 study by Feenberg and Summers published by the NBER entitled *Who Benefits From Capital Gains Tax Reductions?* explores many of the different claims economists have regarding the distribution of tax cut benefits. They used four different measures of economic welfare, including “average income over a four-year period, an estimate of taxable wealth, and for those who have not yet retired, wage and salary income” (Feenberg & Summers, 1990)\(^{7}\). By using different measures, they could somewhat limit any misleading conclusions resulting from biases or flaws in any one measure. They concluded that “Regardless of what measure of economic status we use, we find that the majority of capital gains tax preferences go to those in the top .5 to 2 percent of the income distribution” (Feenberg & Summers, 1990)\(^{7}\).

They then proudly proclaimed that any results claiming otherwise must suffer from flaws. Perhaps one of the more interesting results was that a majority of the capital gains benefits comes from land and real estate assets, not the corporate stock market (Feenberg & Summers, 1990)\(^{7}\). While the distribution of corporate stock ownership is already skewed towards the rich, the distribution of real estate equity is even more disparate.

**Hungerford and the Distribution of Realizations**

Data analyzed by the Congressional Research Service (CRS) from the 2007 Survey of Consumer Finances shows that of the top 5% income earners, 72% of them own stocks and mutual funds, 94% of them own a house, and 91.4% have retirement accounts (Hungerford, 2010)\(^{14}\). For perspective,
only 7% of the poorest fifth own stocks and mutual funds, only 40% own a house, and only 11% have retirement accounts (Hungerford, 2010)\(^{14}\). Regardless of the capital investment category being looked at, the highest income earners own most of it. This would seem to discredit economists who stress how a bunch of “ordinary” people own capital assets that is being hurt by capital gains taxes, because in reality the amount of capital assets owned by “middle America” is negligible. In an Economic Policy Institute issue brief, Dean Baker sums up this phenomenon as follows:

> Most working people will never have any capital gains on which to pay tax. The one capital gain that most people receive in their life is on their home, but this gain is virtually excluded from taxation under current law [$250,000 excludable under 2008 law for married couples filing jointly (SOI Bulletin, 2011)]\(^{34}\). By contrast, the richest 1% of the population typically receive about 90% of all capital gains.

(Baker, 1995)\(^1\)

It is no surprise that the richest segments of society realize the most capital gains, given that they own most of the capital. These numbers are perhaps best illustrated in graph form. In the same report by the CRS that I quoted above, they graphed the distribution of realized gains by income class over a span of about 30 years. The underlying data happens to come from the Congressional Budget Office, coincidentally in the same paper I base a lot of my research on later. I will talk about their methodology in-depth in that section, but essentially what’s important to note is that the CBO defines income as a composite of multiple sources of data not just IRS tax returns. From looking at the chart, it’s apparent that the vast majority of capital gains realizations from just the top .1%, and even the top 5% accrue roughly 80% of all gains. It’s a little hard to see and will be explored in greater detail in my own analysis, but over this 30 year period or so the black and gray bars (together the top 5%) have grown longer and longer, which supports the idea that income inequality has grown as a result of the preferential tax treatment of capital gains.
**Gingrich and Bartlett on Entrepreneurship**

In regards to possible ways a lower capital gains tax is said to stimulate the economy, one of the main points is the encouragement of venture capital. Venture capital is basically the initial investments entrepreneurs make in a startup to help “kick it up a notch” (Emeril Lagassi). Investing in fledgling companies is a very risky proposition, because one could either unwittingly invest in a geek who turns out to be Bill Gates, or one could sink money into a company that never materializes. A lower tax on capital gains is thought to “grease the wheels” of these economy growing investments, so to speak.

In Bartlett’s article that confirmed the findings of the pioneering NBER study that predicted the 1978 tax cuts would increase investment (the first literature reviewed in this section), he quotes a random fellow who says “the capital gains tax cut led to substantial new commitments to venture capital funds, (...) Venture capital has, of course, provided the principal fuel for the entrepreneurial advances that have occurred since 1978 in computers, biotechnology and many other high-tech industries” (Bartlett, 1985). Newt Gingrich talked about the same topic, although his language was a bit less direct. During the same Cato forum speech I quoted from earlier, Gingrich had these points to say about economic growth and how Republicans have been encouraging it:

“We’ve established the right to entrepreneurship, which is Ronald Reagan’s big domestic contribution”. He describes entrepreneurship as “the center of what this debate is about”. “What we [as Republicans] want to do is increase the velocity with which people move from investments that are less productive [companies with no growth potential] to investments that are more productive (...) like the next 30 new ideas that are Microsoft or Merck or Pfizer (...) [because these types of investments] increase economic growth

(Gingrich, 1998).

However, claims of economic growth spurred by increased venture capital investing has not manifested in reality.

A Congressional Research Service report from 2010 (12 years after Gingrich and 25 years after Barnett) cites a report released by the National Venture Capital Association showing that “in 2003, only about 10% of investors in venture capital funds were individuals and families” (Hungerford, 2010). Furthermore, the CRS concluded that despite what proponents of a lower capital gains tax have to say about encouraging startup investing (like Gingrich), “most venture capital, however, is supplied by pension funds, college endowments, foundations, and insurance companies—sources
not associated with the capital gains tax” (Hungerford, 2010). Gingrich has effectively been refuted by data from the entrepreneurs’ own trade group.

ISSUES OF DOUBLE TAXATION AND THE PLIGHT OF THE POOR INVESTOR

One of the ancillary issues discussed with regards to the capital gains tax is the so called “double taxation” effect on capital income. The question being raised here is “are capital gains taxes too high?” (Fleenor, 2006) and the assertive strategy is to assert that the 15% tax rate is actually twice as high as we think, which presents a much more appealing platform to call for capital gains reduction. My cynical interpretation is that it’s a lot easier to convince some person of the necessity to lower capital gains taxes if we tell them the “effective” tax rate is 30 or 40%, rather than the lowly 15% which is already less than other forms of income for some people.

The Mechanism and its Implications Explained

In short, the first stage is the corporate income tax and the second stage is an individual’s income tax on the capital gains which are presumably connected to the already taxed corporate income. The actual tax burden on consumers is greater than the statutory tax incidence of 15%, because the consumer bears the cost of the corporate tax by way of lower capital gains. This is definitely true to a degree, but the effect varies from company to company in amounts that can’t be measured. There are two ways in which an individual can possibly have this tax burden “passed on”, which are through lower dividends and lower capital gain.

Dividends

The first part is straightforward—dividends are basically cash payouts to shareholders straight from a company’s retained earnings, which is the amount of net income they have left over at the end of the year to keep for themselves (or pass on to investors) (Siegel, 2008). A higher corporate income tax is directly and inversely proportional to the stockpile of dividendable cash. If a company decided to give out a lower dividend because of a higher tax levied by the government, in this way the investor would be “bearing the burden” of that tax. The connection is truly there, but decrying this indirect effect as tantamount to doubling the tax burden is disingenuous at best. Some economists insist you can simply add the corporate tax income percent to the individual capital gains tax percent, and arrive at the new number which represents the “true” burden of the individual investor. In a Tax Foundation article, Patrick Fleenor explains this process:
In current law, the statutory federal rate on corporate income is 35 percent. In the simplest type of comparison, then, this corporate rate is added to the statutory rate on individuals' capital income, currently 15 percent, for a total tax rate of approximately 50 percent in the US, while it is significantly lower in many other countries. (Fleenor, 2006)

This is like adding apples and oranges, because when talking about money that ends up in an investor's pocket, there's a 15% tax on 100% of the resultant amount, and a 35% tax on some indeterminate but likely low percent of money that might have been realized in happier times but isn't because of the tax. That is to say, only a small portion of that 35% tax is on money going straight to the investor in the manner of dividends, and this amount is uncertain and subject to the firm's earnings (Siegel, 2008). A more realistic addition would be to weigh this amount somehow, and it would be necessary to create a statistical model estimating the influence retained earnings has as an explanatory variable for the dividend payout decision.

Capital Gains

Of course, besides dividends the other half of this connection relies on the correlation of retained earnings and capital gains in general (dividends are a separate tax class than capital gains, but they are similar in source and nature). While dividends are a direct cash payout from the retained earnings, it's far less clear how retained earnings affect the stock price (and thus an investor's gain). This is how Bruce Bartlett, the author of the second article I reviewed earlier in this section, explains the connection between them:

The value of that share [of ownership in a corporate asset] is generally the present value of the dividends associated with it. If the corporation were to become more profitable, its share price would rise—but the increase merely reflects the anticipation of higher dividends in the future.

(Bartlett, 1985)

So in other words, the two components that serve the connection between the corporate income tax and the individual investor's tax burden—dividends and general capital gains—are really just one component; the capital gains realization depends on “anticipated dividends”, so essentially this whole theory is anchored in the dividend distribution rate.

According to historical data from the S&P 500 index, the average dividend payout ratio—or the fraction of net income a firm distributes as dividends—is around 30% in this decade and can be as low as 10% for small cap companies (Wikipedia contributors: Dividend..., 2011). Because
dividends are the primary conduit through which the corporate income tax burden is passed onto individuals, and because the dividend disbursements make up such a small fraction of a company’s leftover net income on average (and for many companies aren’t correlated to income at all, like Apple), it’s misleading to proclaim that the “double taxation” effect puts the total tax burden in the ballpark of 50% or so, because that would require a substantial transfer of wealth via dividends which clearly isn’t today’s reality.

Magnitude of the Effect

Economists argue this effect can range anywhere from 45 to 61%, but it’s at least three times as large as the tax incidence investors are thought to pay (Marlow, 2001). This simple addition problem is far more complex in real life, and the biggest detriment to its credibility is the mere fact that companies don’t simply pay out all of their retained earnings at the end of the year to investors. A corporation’s income is only your income insomuch as corporate profits get distributed to you as dividends, insomuch as dividends are correlated with corporate profit and to what extent. If all of a company’s retained earnings were handed straight to investors and the books were reset to $0 every year, then yes a corporate income tax would directly constitute a tax burden on investors. Now clearly no economist is arguing this is the case, and there are probably many studies which try and estimate the correlation between corporate income tax and paid out dividends. But anyone who invests in Apple knows that it can’t simply be this simple to assume that any company or even the majority of the companies with leftover cash paid them out as dividends, which is what this double taxation theory requires.

Apple, for example, is literally swimming in cash: “at the end of March quarter [2001], the company had $65.76 billion in cash, short-term investments and long-term marketable securities”. This is enough money to buy Netflix twice, but “Apple pays no dividend, declines to repurchase shares, and makes few acquisitions” (Savitz, 2011). This is nothing more than example to illustrate how companies can amass vast amounts of retained earnings, and do just that—retain them. Apple’s corporate income tax could be 100%, or they could have simply donated the money to charity or dumped it from the Goodyear blimp during the Super Bowl, but none of that money was going to Joe the Investor anyway so it really doesn’t matter. I would imagine the correlation between corporate income tax and how it affects dividend payouts is within the scope of behavioral research, but the variation in behavior is far too vast to just conclude that most of corporate income tax gets
passed right to the investor.

All in all, studies have estimated that without this double burden on investors (i.e. without a corporate income tax), the average lifetime standard of living would increase by about $10,000 for every American (Marlow, 2001)\(^2\). With an average lifespan of 78.37 years in the United States, that would be equal to about $130 of increased standard of living every single year until death; or to put that into personal perspective, a free Cal Poly Business Ethics\(^1\) course textbook as a present for my birthday—every single birthday of my life (CIA, 2011)\(^2\) & (El Coral Bookstore 2011).

Another point is that a 35% tax on corporate income still wouldn't translate to an extra 35% tax burden on an investor—even if all retained earnings were disbursed as dividends—because that amount would still have to be distributed to all the shareholders (of which any single person is a very small fraction). In reality, any indirect effect corporate income tax has on an individual investor is likely minimal.

The double taxation problem is usually presented in a context that explains how the \textit{real} tax people face on capital income is much greater than we think, and that the corporate income tax is a real burden for investors hidden behind a 15% façade. The argument is that any discussion on tax must take into account the true nature of taxation on capital, not just the 2nd step which is directly reported on individual tax returns. This conversation is almost always presented in a light which includes the widest range of taxpayers possible. Obviously, not much popular support would be lent to an effort to lower the capital gains rate, if only a small portion of the wealthiest people would benefit. For what it's worth, the Congressional Budget Office's comprehensive income definition which I source later during my analysis takes into account the imputed affects corporate income tax has on individual investors.

\textbf{On Terms of Equality}

There exists a bountiful array of consequences economists argue the capital gains tax will either promote or undermine, but what does it speak of equality? Some of the literature reviewed thus far has shown that a relatively elite group of equity holders control the vast majority of both capital and the gains accruing from it, but does this necessarily mean that the preferential tax treatment is a vehicle for a historically increasing level of inequality? Perhaps the state of inequality would

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\(^1\) Contemporary Moral Problems by James White, a highly recommended reading from PHIL-335
be the same regardless of the proportions of total income the super-rich derive from any single category, the two categories of interest here being wages and capital gains. In light of conflicting research conclusions about the types and magnitude of the capital gains tax’s consequences on the macroeconomy, my investigation concentrated specifically on the implications for the state of inequality in America.

Early Phases of Research and Designing the Model

The running theory for my research was that a historically lower maximum tax rate on capital gains compared to ordinary income was a vehicle for the spreading inequality in the United States. If this hypothesis were true, there would be a number of telling signs manifested in the available economics data. For one, if capital income was indeed more attractive than ordinary wage income for certain segments of the population, it would be important to find a bias towards these sources of income for those people. This was the first avenue I explored, and I looked for data that would indicate what correlation exists between the source of income and the amount of income an individual has.

Choosing a Data Source with the Right Income Definition

One of the common criticisms brought up with income inequality studies is that the definition of “income” has changed widely over the years according to the IRS for tax purposes, but also varies widely amongst economists. For instance, Bartlett devoted a whole section of his article to philosophizing about what constitutes income. He concludes that capital gains are income just as much as wages are income, because both sources are a “return on capital”—one is an ownership stake in a company, and the other is a product of human capital (physical labor) (Bartlett, 1985). Other people have different concepts of income. The IRS has a sizable list of the things they consider party to “Adjusted Gross Income” (their definition of taxable income), and some items go in and out of favor when new legislation is passed. So what do we do to reconcile the different concepts of income?

The IRS tries to enable consistent comparisons by offering data using a so called “1979 income concept”, which is sort of like the Consumer Price Index in that there’s a standard “basket of goods” (tax items) that they picked to remain constant from 1979 until now, so data from that whole period can be compared with the same definition of income (SOI Bulletin, 2011). Just one source
of data usually isn’t enough, however, and economists know this.

Going back to the Feenberg and Summers study for example, they chose four different measures of income just to silence any naysayers hostile to a single method, and decided that “the conclusion that most capital gains go to very high income taxpayers is robust to plausible variations in the exact income concept used to assess this issue” (Feenberg & Summers, 1990). However, this might be a bit optimistic. As Alan Reynolds (rightfully) argued in his essay about stagnant inequality levels, all data sources have their own flaws. Taking all this into account, I set out to find income data with an accurate and well thought out income classification so my results would be as robust as possible.

**IRS or the CBO? Two Definitions and Features of Each**

There are two main sources of data I selected for this analysis, and I chose two sources so I could compare the results between them. It is very true that different conclusions can be brought from different (and even the same) sources, depending on how the information was compiled or represented. The more angles there are to approach and investigate the data, the more comprehensive and ultimately useful this research will be. Undoubtedly the largest statistical abstract of an American taxpayer comes from the yearly datasets provided by the IRS Statistics of Income office (SOI). The office releases aggregate data from a multitude of forms, and breaks down the information in a lot of meaningful ways. At first I looked at the individual tax return data on Form 1040. I located a table that grouped the amounts of income reported for different sources by Adjusted Gross Income (AGI).

“Adjusted Gross Income” and its Peculiarities, Courtesy of the IRS

AGI is a measure that the IRS almost singularly uses to stratify taxpayers into different income classes. Essentially, Adjusted Gross Income is the income that’s relevant to the IRS for taxing purposes (SOI Bulletin, 2011). This may differ from some person’s true total income, and the precise definition has changed over the years.

A small selection of items constituting AGI from 2008, for example, include jury duty pay, prizes and gambling winnings, bartering income, and “certain” student loan interest (SOI Bulletin, 2011). The categories relevant to this research are “Compensation for services, including wages, salaries, fees, commissions, tips, taxable fringe benefits, and similar items;” hitherto and hereafter referred to as ordinary income, and “Net gain from the sale of capital assets,” hereafter referred to as simply
capital gains (SOI Bulletin, 2011). To be more specific on the type of gains that qualify, “Capital assets for tax purposes included all property held for personal use or investment… [such as] homes, automobiles, and stocks and bonds” (SOI Bulletin, 2011).

However, an important note about reporting capital income is that up to $250,000 can be excluded AGI for married couples filing jointly, so this is effectively concealed from individual returns data. This is a significant aspect because it introduces somewhat of a bias in the data. This was one of the points that Reynolds brought up in his piece, when discussing how a lot of capital gains are from “ordinary people” selling their houses or realizing other income on capital assets that gets effectively concealed in the tax reporting process (Reynolds, 2007). It wouldn't really be fair to conclude that “the rich” are realizing most of the capital gains, if the single greatest thing that most “non-rich” people capitalize is not included in the individual tax return. In other words, there is bias introduced by underspecifying the incomes of lower income people and overspecifying the incomes of higher income people, because millionaires will likely have their (expensive) property sales reported as capital gains while the less affluent people might not. The deduction serves as a statistics shelter of sorts that hides away the gains of certain people while doing nothing to prevent the exposure of others.

Another important consideration is the distinction between long term and short term realization activity. These definitions have shifted around through time of course, but from 2008 short term consisted of equities held “one year or less”, and everything else was considered long term. Short term gains are taxed at ordinary income rates, while long term gains are taxed at the capital gains rate (SOI Bulletin, 2011) & (Hungerford, 2010). Since short term gains are already calculated in the manner my retrospective analysis is concerned with, in the most specific terms this report only studies the distributional effects of the tax rate on long term gains.

Comprehensive Income Definition, Courtesy of the CBO

The most conclusive definition of income I came across in my research was developed by the Congressional Budget Office in a 2008 report entitled Historical Effective Tax Rates, 1979 to 2005: Supplement with Additional Data on Sources of Income and High-Income Households (CBO: Historical, 2007). Recognizing many of the problems in deriving measures of income from single sources like the IRS, the CBO sought to create their own definitions that weaved together the
strengths of various income data.

Essentially, they combine SOI data from the IRS with the Census Bureau’s Current Population Survey (CPS), which has a lot of demographic information not available from the IRS. In addition, the Census data asks the survey taker to report their overall income for that year, which would reflect the complete picture of what the survey taker considered their income regardless of source or particular circumstances of how it was made (Census Bureau, 2010). The CBO then used statistical analysis to tie together the numbers from the two sources data, to present as clear as possible the combined amount of information for the same people (CBO: Historical, 2007). Their definition of income is as follows:

The sum of wages, salaries, self-employment income, rents, taxable and nontaxable interest, dividends, realized capital gains, cash transfer payments, and retirement benefits plus taxes paid by businesses (corporate income taxes and the employer’s share of Social Security, Medicare, and federal unemployment insurance payroll taxes) and employee contributions to 401(k) retirement plans, all in-kind benefits (Medicare, Medicaid, employer paid health insurance premiums, food stamps, school lunches and breakfasts, housing assistance, and energy assistance).

(CBO: Historical Supplement, 2008)

They essentially computed any conceivable type of income some person might have, placed people into households using Census demographics, and then sorted the data into quintiles of household income. An interesting thing to note about this definition is that it takes into account the “double-taxation” problem that I dismissed earlier. They actually calculated, or “imputed” the income effects that corporate income taxes induce by trickling down to individual employees/investors, presumably by way of affecting overall wages or other firm decisions about how much healthcare or dividends they want to provide, etc. The intricacies of this exact method remain a mystery to me, but the fact that they did do it indicates that the section of this paper devoted to dismissing the whole double-taxation problem as a red herring might be founded on some degree of ignorance. While I can not vouch for the statistical procedures I don’t understand, I simply hope that the brightest minds came together and considered all the possibilities I’m not keen of, and churned out a magical encompassing definition of income that is better than anything I could conceive myself.
FIRST LOOK AT THE DATA

**Earned and Unearned Income: Marginal Tax Rates Compared**

The following figure [Figure 02] graphs the top marginal tax rates of ordinary income versus long term capital gains income, which sparked my interest in this topic:

![Figure 02: Historical Top Statutory Tax Rates for Wage and Capital Income](image)

The marginal rate on capital gains has always been either far below or at best tied with the marginal rate on ordinary income, but never above it. If the marginal rates were the same over time, there would certainly be some distributional effect towards less income inequality—if it were true that the distribution of capital gains income was not uniform across income levels (as indicated). If all people receive the same share of their income from both of these sources, then the differing rates would have no net effect on inequality at all. If, however, “the rich” accounted for the majority of the realizations, it would certainly be true that this tax treatment inequality exacerbates income inequality.

**Share of Income by Source**

To calculate the share of income by source, I downloaded Table 2.1 of the Statistics of Income (SOI) data set from individual tax returns, entitled Individual Income Tax Returns, Returns with Itemized Deductions: Sources of Income, Adjustments, Itemized Deductions by Type, Exemptions and Tax Items, by Size of Adjusted Gross Income (SOI Table 2.1). Essentially, this table shows the breakdown of how much taxable income came from each taxable item, with the population divided into brackets based on Adjustable Gross Income. Remember that AGI is the taxable income as...
determined by the IRS, which excludes certain things and may not account for a person's total income in a given year. This data also provides the total number of returns for each tax item, so it's easy to divide the total taxable income by total returns to get the average share of income from each source for each AGI bracket. One thing to note is that the number of income brackets the data is divided amongst changed in the year 2000.

Prior to then, the highest bracket was $1Mn or more, but after that they added more categories like $1Mn–$1.5Mn, $1.5Mn–$2Mn, et cetera., up to $10 million or more. There were two things I did to account for this: in some cases I simply summed all the million dollar or more income brackets together for the year 2000 onwards, so that data would have the same brackets as the data from the prior decade. In other cases I opted to ignore the data from 1993 to 2000, and just use the most recent 10 years. I only chose this latter option so long as the overall trends or patterns in the data didn't change or impact the drawn conclusions in a meaningful way.

This first graph [Figure 03] indicates that more or less, the average net gain realized per capita increases as income class increases. There is a lot of intermingling present in the trend lines which cloud a discernible pattern, but the overall trend becomes more transparent when more brackets are added to the chart. The first graph only goes up to $100,000 AGI, this next graph goes up to $1,000,000:
After adding three more brackets up to a million dollars, it is strikingly apparent that the amount of gains realized on average for some person making $100,000 or less is insignificant in comparison to those making more, and the most dramatic increase is between people in the $200K–$500K group and $500K–$1Mn group. The specific numbers aren’t as important as the shapes. The blue line at the top is the highest income people, the purple line far below it is the next highest income people, and almost everyone else is pancaked at the bottom with no realized gains to speak of. Inequality in the distribution of capital gains is apparent even amongst millionaires (for which only more recent years had extra millionaire categories):

**Figure 04:** Net Realized Gain Per Capita, by AGI (Up to $1Mn)

Here, the select few making over $10Mn a year (the blue line) is far and above the others, and this
illustrates how the amount of gains one realizes strongly coincides with total income on a relative income category basis. Richer people receive more capital gains than less rich people, et cetera. It’s not a ground breaking idea; in fact most people would probably assume or expect this to be true. But, what it does seem to suggest is that the same percentage tax levied across capital gains will affect different people in different amounts, more specifically the highest gain realizers will pay the most tax because they incidentally have the largest tax base. On the flip side, they also stand to gain the most from the preferential tax treatment.¹

What I still needed to find out was if the 15% cutoff for capital gains disproportionately benefitted wealthier people relative to everyone else, thus creating more inequality. So far this research confirms that the tax rate has a greater impact as it’s applied to the higher categories, but not that this impact is unfair on a proportional basis of total income.

One of my first concerns was that the AGI groups aren’t divided into equal amounts of money. For instance at the poorer end, the segments are five thousand dollars wide, but as the AGI increases the brackets contain broader and broader ranges. It seems a little bit arbitrary; for example $60K–$75K group has a 15 thousand dollar spread, but the next group has a 25 thousand dollar spread. I’m not sure how it was decided to divide the groups up or for what reasons, but it may not matter in light of my using per capita values for the analysis. In any case, I knew I needed more information and data to analyze.

**Trying A Different Data Source**

It was difficult to ascertain what types of data and what sources of data would be necessary at the very beginning of the analysis, and my data needs and graphing interests was an evolving processes². Those first graphs of dollar amount of realized capital gains per AGI group [Figure 03] were exploratory graphs. I realized that what I really wanted to show was that rich people held a higher portion of the capital gains assets, which would help confirm my assertion that the preferential tax rate is like a tax shelter of sorts that mostly “rich” people derive benefits from.

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¹. Note, I graphed the millionaires separately because it’s impossible to include their brackets with everyone else—the y-scale doesn’t easily encompass the whole range. Most of the graphs in this paper are thus shown with both the highest brackets turned on and off for display purposes.

². This process mostly consisted of compiling data, experimenting with graphs, then realizing I didn't have enough information so compiled more data, etc.
As explained before, there are a few different main sources of data that this type of analysis can come from. There is data straight from the IRS Statistics of Income office, which suffers from the problem of not accounting for non-taxable income (not included in AGI) as well as not being able to show a “big picture” type of result. By big picture I mostly refer to the fact that, as Alan Reynolds correctly pointed out, tax returns have a lot of unobserved influences embedded in them. When it comes to the first problem of AGI not being very inclusive, it’s important to discuss the fact that a variety of income definitions exist.

**Definitions of Income as a Standard of Living Measurement**

According to the Oxford English Dictionary—the definitive source on the English language\(^1\)—income is defined as follows:

*That which comes in as the periodical produce of one's work, business, lands, or investments (considered in reference to its amount, and commonly expressed in terms of money); annual or periodical receipts accruing to a person or corporation; revenue.*

(OED Online)\(^{15}\)

In other words, income is stream of incoming payments that contributes to net wealth over time. This is far more inclusive than the Adjustable Gross Income definition of income as purported by the IRS, which has a lot of exclusions. As explained earlier, up to $250,000 of capital gains from a joint 2008 filing can be excluded from the sale of a house for tax purposes. Being “excluded” simply means that that income is hidden from the IRS, and in fact does not show up as a part of Adjustable Gross Income (which only includes net taxable income). This is one example of many that underscores how simply analyzing trends based on AGI is an incomplete picture of the true income situation of individuals. For the interests of this paper, income is defined as *something that increases standard of living*, which is almost the same but slightly different than “wealth”.

Wealth may be stored in forms that don’t immediately help you, like intangible assets. While these retirement accounts certainly add to some person’s “wealth”, it doesn’t really make sense to include that in measures of income inequality because the benefits aren’t immediately available. This is one of the criticisms I had with a particular example of Alan Reynolds’ paper, though his overall point that AGI is incomprehensive I agree with. In a section criticizing the IRS’s definition of income, he states:

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1. Also according to the Oxford English Dictionary
Income Inequality and the Capital Gains Tax

Investment income accruing in tax-favored savings plans is not recorded on income tax returns. The earnings build-up inside tax-favored savings plans is income in exactly the same sense that taxable capital gains, dividends, and interest are income. (Reynolds, 2007)

Despite the irony that this omission actually helps Reynolds’ case by ignoring even more highly unequally distributed sources of income (Burtless, 2007), I still disagree that these sources of income should count as income for inequality’s sake.

On a dictionary definition basis, streams of payments to a 401(k) certainly add to one’s wealth, and would therefore technically classify as capital income. However, the entire discussion around income inequality does not assert that this inequality is bad intrinsically; it is what income inequality leads to which is seen by some people as unfair. It is the material things that income provides that constitute a person’s “standard of living,” and I would argue that this is the standard that people refer to when they speak of income inequality.

For example, if someone earns $1,000,000 a year but has $5,000,000 of debt, they are in a worse position than another person who only makes $50,000 a year but lives within their means. It is in this sense that I personally consider “cash-in-pocket” income to be relevant income for the purposes of income inequality, because I see measures of income inequality as really a best attempt proxy at measuring living standards inequality.

Income in tax favored savings plans is not income in the same way that taxable capital gains are income, simply because this income does not help you right now. In other words, it's unrealized income. A Roth IRA might become realized income 30 years from now when you retire, and it's at that moment when the money is converted from a number on a bank statement to cash in your pocket, and it's at that moment when the IRS comes knocking. It's the same thing for capital gains. We don't tax unrealized capital gains simply because they do not represent anything more than a number, and only become “income” (life standards affecting) at the point of realization.

In that light, it is important to try and make a definition of income as inclusive as possible for recognizing standard of living, while leaving out measures which are not reflected in that. Some important things the IRS does leave out are transfer payments, or a nicer way of saying welfare payments. This is a valid point that Reynolds brings up, because welfare handouts are certainly

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1. For full discloser, “some people” includes the author of this paper.
cash-in-pocket income for poor people which is excluded or hidden from Adjusted Gross Income measures, and this biases the data to make poor people seem worse off than they really are.

**Using the CBO Data with Quintiles**

The CBO data is different for a fundamental reason than the IRS data I used for making the earlier AGI graphs [Figure 03] in that the categories aren’t delineated by AGI but instead by “quintiles” and using their own constructed income definition. When income data is put into quintiles, essentially what happens is every person gets ranked from richest to poorest, with the top 20% being in one quintile, the next 20% richest people being in another quintile, et cetera (CBO: Historical, 2007). This allows for interesting comparisons like “the top 20% richest people are this compared to the bottom 80%”, for instance, which is a lot more appealing than graphing by AGI and its arbitrary income divisions.

That being said, now that I had the CBO data which I decided was better and more comprehensive than the IRS data, I sought to graph the proportions of income for different quintiles in terms of wages versus capital gains. I wanted to see if there was a discernible pattern in the way that richer people acquired their money, because my hypothesis was that a greater portion of “rich people money” came from capital gains than for everyone else, and this is in line with the overarching thesis that the preferential capital gains marginal rate is disproportionately beneficial to the rich and thus been exacerbating income inequality. First, to get an overall sense of the distribution of wealth across different quintiles and by income source (the two sources of interest being wages versus capital gains), I made a stacked area chart plotting the share of all pre-tax income apportioned to each quintile spanning the full time period of the CBO data set.

**Figure 06:** Share of Wage and Capital Gain Income as Percentage of Total, by Quintile
What these two graphs show is that the distribution of capital gains realizations is drastically more concentrated in the highest quintile than wages are, and I believe this has to do with the preferential tax treatment. The income tax rate is very progressive in the United States, which means that as wage income increases, the tax rate in percentage increases accordingly (Slemrod, 1993). So not only do people with higher wages pay a larger dollar value in taxes, they pay a larger portion of their income as well.

The average person might suspect the top 20% highest income people to hold a larger share of the total wage income in the country compared to everyone else. What is interesting however, and not at all intuitive without examining the data, is that wage income looks distributed quite equally when compared to the distribution of capital gains realizations, which accrue almost entirely to the top 20%. Clearly, the capital gains tax rate has a much greater impact on the distribution of total after-tax income than the ordinary income tax (despite the income tax being so much more progressive), simply because the capital gains realizations are extremely consolidated in the richest quintile. Because the capital gains tax rate has historically been much lower than the wage rate, there most certainly has been greater inequality produced over time as a result, but by how much?

**Original Research Plans and Stages of Investigation**

In the preliminary stages of research on this topic, I had planned to derive the benefits from the preferential tax treatment by first finding what capital gains rate and what ordinary wage rate likely applied to each AGI bracket, which would have been very inexact because I would have had to average the incomes of millions of people and just assigned them all the same tax rates (there is no document that gives this information directly). Knowing that, I would have been able to divide the after-tax income from capital gains by the capital gains rate I estimated was applied to them, and then reapply the ordinary wage rate to arrive at ‘the after-tax income on capital gains had they been taxed at ordinary versus preferential rates’. By taking the difference I could know the quantity of money each group of people “saved” due to the lower capital gains rate, which I planned to graph in a number of different ways. For instance, I was particularly interested in how the quintile distributions of total after-tax income would change. Would the fifth quintile area (top 20%) area get skinner and the next 20% area get wider, and by how much? These are the questions I was interested in.

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1. “Progressive” just means that the tax rate increases in progressively higher income brackets. I claim the ordinary income tax is more progressive than the capital income tax simply because the former progresses all the way up to 35%, but the latter is capped at 15%.
asking. When I actually started to try and calculate these effects, I realized it was almost impossible. First, guessing the tax rates that were incident\(^1\) to each category would have been extremely daunting, because I could not find a comprehensive tax rate schedule for any other than the most current year. The tax rate schedule is basically the chart that says “if you make between this much money and this much money, you pay this percent”. It must exist somewhere, but because I couldn't find it I would have had to consult the legislative history for the past 20 years, for every single marginal rate bracket (and there are a lot).

After finding everyone’s new after-tax income, I would then be faced with the task of estimating how many people changed income quintiles because of their new incomes. For example, people close to the lower boundary of a quintile would likely fall into the quintile below when faced with a greater tax burden. Unfortunately, there would be no easy way to figure out how many people jumped quintile levels.

After searching for historical rate tables for every tax bracket and coming up empty handed, I finally found the “Holy Grail” of data tables. It turns out this data was sitting in plain site, I had just overlooked it due to ambiguous table titles. The following section details the meat and gravy of my “analysis”, or value added experiment.

**THE HOLY GRAIL TABLE**

The so called “holy grail” of this analysis is entitled *Table 4 – Individual Income Tax Returns with Modified Taxable Income: Tax Classified by Type of Tax Computation and by Size of Adjusted Gross Income (SOI Table 4)*\(^3\). It’s an easy table to overlook, because the title doesn’t indicate or even hint at first glance what information is being tabulated. What is modified taxable income, and what are different types of tax computations? The SOI releases a bulletin every year which highlights interesting charts or numbers compiled from that year’s statistical snapshot of U.S. taxpayers, and it is in this report that the tables are explained. My hitherto spreadsheet search consisted of hunting by table names on the SOI website, and there are a lot of data files. When I actually stopped to read their report I discovered that the “alternate tax computation” in Table 4 consists of the difference in

\(^1\) In Economics parlance, tax “incidence” is essentially tax burden, or the obligation that “falls on” a tax payer. The statutory incidence must not be assumed to always equal the real incidence faced by a tax payer, because the burden of the tax applied to one entity might be conferred to another entity in indirect or unexpected ways. For example, is the “Energy Commission Tax” statutorily levied on PG&E actually incident to PG&E in the end? No, because it shows up right on the bill as a burden passed to the consumer. Thanks to M. Marlow for explaining this.
tax money that would have been collected had capital gains been taxed as ordinary income (SOI Bulletin, 2011)\textsuperscript{34}. Essentially, what would have been very difficult and very inaccurate for me to impute was already calculated for me, for every single year, for all AGI brackets. The source data (a portion from 2008) looked like this:

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline
Type of tax computation & Number of returns & Adjusted gross income & Modified taxable income & Income tax before credits, regular tax computation & Tax generated & Tax differences due to alternative computations \\
by size of adjusted gross income & (1) & (2) & (3) & (4) & (5) & (6) \\
\hline
\textbf{Returns with Schedule D tax computation} & & & & & & \\
\hline
Under $5,000 & 97,268 & 278,525 & 63,242 & 97,268 & 9,920 & 97,268 & 6,362 & -3,558 \\
$5,000 under $10,000 & 157,981 & 1,173,429 & 255,412 & 157,981 & 33,479 & 157,981 & 25,981 & -7,499 \\
$10,000 under $15,000 & 356,068 & 4,523,750 & 991,402 & 356,068 & 126,375 & 356,068 & 100,277 & -26,099 \\
$15,000 under $20,000 & 473,796 & 8,308,943 & 2,818,465 & 473,796 & 348,059 & 473,796 & 289,956 & -58,103 \\
$20,000 under $25,000 & 558,401 & 12,616,505 & 4,291,706 & 558,401 & 582,390 & 558,401 & 481,972 & -100,418 \\
$25,000 under $30,000 & 654,183 & 18,040,240 & 7,106,562 & 654,183 & 981,009 & 654,183 & 838,867 & -142,142 \\
\hline
\end{tabular}
\caption{Excerpt from SOI Table 4}
\end{table}

On the far left column it says “Returns with Schedule D tax computation”, which indicates these are tax returns that reported either a capital gain or loss during the year (capital gains are reported on a separate form called Schedule D) (SOI Bulletin, 2011)\textsuperscript{34}. Column #5 shows the total dollar amount of “Income tax before credits, regular tax computation”, which is essentially the amount of taxes that were actually collected in 2008 for those capital gains for that AGI group (or at least a statistical abstract, anyway). The “regular computation” is simply the tax laws as they applied in real life at the time, which namely consists of a 15% top marginal rate on capital gains. Column 7, which shows the amount of “Tax Generated”, displays the amount of the \textit{alternative tax computation}, which for this segment of Table 4 means the tax that would have been generated in an alternate universe where capital gains and ordinary wages were taxed one and the same (SOI Bulletin, 2011)\textsuperscript{34}. The last Column #8 shows effectively the amount of “savings” that were experienced as a result of the preferential tax treatment.

So for instance, for the first AGI bracket of people making less than $5,000 in 2008 who also happened to realize capital gains (or loss), the preferential tax treatment of capital gains saved them about $3500. Of course, this is $3,500 spread across 97,000 people; it effectively saved them nothing.

\textbf{Running the Analysis With IRS Data}

Now that I had this data, I set off trying to graph it in meaningful ways. Half the battle in this
analysis was structuring the data in a format conducive to an Excel pivot table, which is the only reasonable way any of it could have been graphed. In the best way that I can explain it in writing, a pivot table allows you to consolidate data from many different inputs across many different time periods, and then display it in a single chart or table with drop-down dialog boxes letting you dynamically select which inputs you want to display at any given moment. So for instance, in the graphs I had before that showed the distribution of capital gains as a percentage of total, there was one graph that went up to a million dollars [Figure 04] and a separate graph that I called “the millionaire’s edition” [Figure 05]. In Excel these are actually the same graph, I just unchecked the millionaire AGI brackets for the non-millionaire graph and then reselected those categories for the millionaire graph. The reason why pivot tables were required for this analysis was because I had about 20 years of data for a multitude of different categories and for a multitude of AGI brackets, that I needed to be able to change the inputs dynamically.

**Tax Savings (Dollars)**
Once the data was corralled into the extremely inflexible format required to “pivot”, the first thing I graphed from my newly discovered data set was the total dollar amount saved for each AGI group as a result of the preferential tax treatment.

![Figure 08: Tax Savings Generated From Preferential Capital Gains Treatment](image)

The legend is sorted in order of highest tax savings, so at quick glance it’s clear that those making between $200K and $1Mn have the highest tax savings, and the volume of tax savings decreases with each Adjusted Gross Income class. AGI groups of those making over a million dollars a year are not shown here, because predictably those values compress the y-axis enough that none
of lower class lines are indistinguishable from each other. As the tax savings appeared higher for richer AGI groups, it helped confirm my suspicion that the preferential tax increases inequality in this way. A much more useful relationship I sought to capture, however, was the change in after-tax income associated with the alternate tax computations.

Failed Graph of Income Difference—Limitations of IRS Percentiles

My prediction was that richer AGI groups would experience a greater dampening effect from the tax law than the poorer AGI groups, because people in the poorer groups are less likely to have hit the 15% top marginal tax rate in the first place, and thus aren’t likely to see any of the benefits. I expected this graph [Figure 09] to show a greater “wedge” between the two tax computations the higher the income floor, but my predictions were fraught with dismay.

I tried using the IRS “percentiles” designation of income1, because I thought it would allow for a more streamlined comparison between categories of wealth, compared to if I just picked three random AGI income groups to compare against. Here I chose the “Top 1 Percent”, “Top 5 Percent”, and “Top 10 Percent” groups for analysis.

**Figure 09: After-tax Income With and Without Alternative Tax Computation**

![Graph](image)

Here is where I came across the first problem with the IRS data set structure. Out of the multitude of different ways the SOI breaks down the numbers, the one thing they don’t calculate are quintiles (or quartiles, or anything meaningful like that).

The difference between the two lines for each of the three groups shows the amount of tax dollars

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1. In addition to AGI they also provide data digested in this manner.
saved due to the tax preference, which appears to grow slightly over the time period displayed. What
the problem is is that the IRS percentiles are not a meaningful way of presenting data, because the
Top 10% necessarily includes both the Top 5% and Top 1%, so graphing all three of those together
(as I did) merely shows identical shapes at different heights—not different heights because richer
people have greater tax savings, which is what I was aiming to show—but because the percentiles
are simply composites of each other. This is where the power of quintiles comes in, because it you
can compare each fifth of the economy in their own separate group, and see how the fifth as a whole
experienced different savings. In other words, it's more important for comparison to compare “the
rich” against the “slightly less rich” against the “mediocrity” class and so on, with an equal number
of people in each class. Percentiles don't allow this because successive exclusion merely represents
less and less of the population included in the exclusion before it. It isn't logical to compare the
“top 1 percent” with the “top 5 percent”, for example, but it does make sense to compare the “top
1 percent” with “the next 4%”, or any group definition that segregates people to distinct groups.
This is essentially the type of comparisons quintiles are created to allow, so I plotted a method of
translating this essential data into the more flexible form than was originally composed.

The Power of Quintiles

The way quintiles are created is by ranking every taxpayer from rich to poor, and then simply
segmenting each fifth of the population (CBO: Historical, 2007). Quintiles necessarily have an
equal amount of taxpayers in them, and they can only reliably be calculated using data from the full
set of taxpayers (it would be hard to rank every person without information from every person).
Unfortunately I faced this data conundrum: The IRS is the only agency who produces this “alterna-
tive tax computation”—or at least the only one that I know of—and their data are classified into
seemingly arbitrary AGI segments with different numbers of people in each. On the other hand,
the CBO conveniently calculates the quintile floors using their own comprehensive definition of
income, but sadly doesn’t provide this alternative tax computation that I need.

I effectively had two sources of data, they each had one component of information I needed, so I
was forced to combine them somehow. There were two possible options. 1) Translate the tax say-
ings per AGI bracket into the CBO’s own comprehensive definition of income, or 2) roughly apply

1. The “floor” or “roof” is the minimum or maximum number dollars serving as the bounds enclosing the quintile.
If the top 20% floor is $100,000, for example, than anyone making more than $100,000 is in the top 20%
the CBO quintile definitions on top of the IRS numbers.

I chose the second option because only the CBO could possibly translate the AGI definition of income into their own definition of income, because they themselves derived the former from the later using black-box statistics wizardry too complex for me to understand or modify myself. The following is the procedure I developed to apply CBO quintiles on top of AGI brackets, to hopefully draw more meaningful conclusions from the available data

Translating AGI Brackets into CBO Quintiles: Methodology

Quintiles (or quartiles, or sextiles, etc.) are defined with a so-called “floor”. The floor for the poorest 20% quintile is basically zero, so anybody who makes anything or nothing at all qualifies for at least the bottom quintile. This is not exactly true because this quintile also includes people who make negative income, so the actual floor undefined. The floor of the 2\textsuperscript{nd} quintile makes up the “roof” of the first quintile, and everyone between the floor and the roof belongs to that quintile. Both the first quintile (poorest) and the 5\textsuperscript{th} quintile (richest) have an undefined floor and roof respectively, so they are delineated by “everyone up to” the neighboring roof or floor, respectively.

Now, suppose the CBO bottom quintile consisted of everyone up-to-but-not-including $20,000 of income per year. And let’s say that the IRS data conveniently had two AGI brackets, $0-$9,999 per year and $10,000-$19,999 per year. Translating the CBO bottom quintile into AGI brackets would be as simple as adding the two AGI brackets together, because this combination is bounded by the same $19,999 division line of that makes up the CBO’s 2\textsuperscript{nd} quintile floor, and thus all the people from that IRS data set could be mapped to the respective CBO quintile. Unfortunately, not only do the CBO quintile definitions always fall on some arbitrary number that changes every year, the AGI brackets are also arbitrarily wide and so include unequal amounts of people, also changing every year.

I solved this problem with a laughably simple assumption and an absurdly complicated Excel formula. I constructed this formula through stages, which I will explain the reasoning behind below.

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1. The division doesn’t have to be by quintiles, and really only depends on what the researcher is interested in comparing. For instance it may be useful to compare the “top 5%” or the “top 1” of taxpayers to other portions, which would likely necessitate the use of ventiles (four ventiles in a quintile) or other subdivisions. Thanks to C. Battista for explaining this.

2. In my experience as a scholar of economics, one constantly reinforced observation is that ‘laughably simple’ assumptions seem to underpin every economics model ever devised, so perhaps a uniform distribution is not so laughable.
**TWO STAGE CONVERSION FORMULA**

Using the example above, imagine if the CBO’s first quintile roof was actually $15,000 instead of $19,999. How would the AGI groups be added up then? Well, my laughably simple assumption was that within each AGI group there was a uniform population of taxpayers. In that case, to do the translation you would add all the taxpayers in the $0-$9,999 bracket with half of the taxpayers from the $10,000-$19,999 bracket—and not just any half, the lower half. With simple division lines like this, I figured I could easily calculate what percentage of the people in the AGI bracket that fell across the quintile division line went to one side, with the remaining percentage of (equally distributed) people subsequently going to the other side. This is basically what I did using logical statements in Excel. For instance, in pseudo Excel-speak I came up with a formula that said IF $15,000 (quintile boundary) is “<=" (greater than or equal to) $9,999 AND “>=" (less than or equal to) $20,000, THAN *yes_boundary_group* (i.e. the quintile boundary falls between the AGI group $9999-$20,000, so I assigned the Boolean operator “yes” to denote that group as the one being split in half, so further operations could occur). All AGI groups below this would obviously contribute 100% of their people to the quintile in question, while all AGI groups above this would be in the quintile above and thus contribute no percentage of their population to the quintile in question. This was a two-step process and the next stage was to say: IF “*AGI group* = yes_boundary_group, calculate percentage contained under boundary. It was a simple calculation to find the percentage of people being contributed to each boundary hugging quintile: in this case the AGI boundary group has $10,001 inclusive ($20,000 – $9999), or in my spreadsheet (*ceiling – floor*), and to find the contributing percentage it’s just

\[
\frac{15,000 - 9,999}{10,001} = 50\% \text{ contributed}
\]

Then it is just a simple operation to map everyone between the $9,999 floor and $15,000 boundary to the lower quintile and everyone between $15,001 and $20,000 to the quintile above. So I took a simple concept and formed an equation that could work in a programmatic way for arbitrary floor and ceiling numbers across every year for every quintile for every type of data I felt interested in graphing, which evolved over time as I realized each new graph didn’t reveal any information I wanted to know.
RESULTANT SPREADSHEETS EXPLAINED

This is what my spreadsheet (a very small representative portion) looked like, broken up here for presentation purposes:

Figure 10: Excerpt From My Resultant Data Tables

<table>
<thead>
<tr>
<th>Year</th>
<th>AGI</th>
<th>Lower AGI</th>
<th>Upper AGI</th>
<th># returns</th>
<th>Tax Rev. with capital taxed at ordinary rates</th>
<th>Tax Rev with capital taxed at actual rates</th>
<th>Amount Realized (orig)</th>
<th>Amount Realized</th>
<th>Tax Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>Under $5,000</td>
<td>$0</td>
<td>$4,999</td>
<td>596,662</td>
<td>118,639</td>
<td>102,890</td>
<td>37,833</td>
<td>37,833</td>
<td>15,749</td>
</tr>
<tr>
<td>1997</td>
<td>$5,000 under $10,000</td>
<td>$5,000</td>
<td>$9,999</td>
<td>335,911</td>
<td>192,613</td>
<td>170,408</td>
<td>133,851</td>
<td>133,851</td>
<td>22,205</td>
</tr>
<tr>
<td>1997</td>
<td>$10,000 under $15,000</td>
<td>$10,000</td>
<td>$14,999</td>
<td>458,433</td>
<td>381,076</td>
<td>351,023</td>
<td>214,119</td>
<td>214,119</td>
<td>30,053</td>
</tr>
</tbody>
</table>

- Columns #3 and #4 are simply the AGI definition placed into their own column, so my formula could find the “upper boundary” and “lower boundary” for each group.
- Columns #5, 6#, #7, and #9 are taken straight from the original IRS Table 4 which listed the capital gains tax under different tax computations (SOI Table 4)\(^{33}\).
- I titled Column #8 “Amount Realized”, which is essentially the pre-tax income on capital gains accrued by that AGI group, which I took from a different IRS table (SOI Table 2.1)\(^{32}\). That other table had different AGI boundary definitions for some reason so I had to reflow them.
- Column #9 is the tax savings as a result of the preferential tax treatment, which is just an inverse of the original negative numbers from SOI Table 4.
- Column #10 is simply tax savings divided by the number of returns (#9/#5).
- Columns #12 and #16 are the quintile floor boundaries which are taken from the CBO data which they formulated using their own income definition; itself a regression composite of IRS data and Census data.
- Columns #13, #14, and #15 are created using my formula which assigns a portion of the
preceding columns to the quintile based on the quintile definitions surrounding it, using the method I described above.

So for instance, the total tax savings of the first AGI group from Column #9 is $15,749, which is represented by the same number in Column #13 (just orders of magnitude bigger reflecting different source formats). Because all of the people in that first AGI group of <$5,000—and thus all of their associated tax savings—are between the quintile floor of $0 (#12) and the next quintile floor of $17,000 (#16) my formula awarded 100% of those savings to that quintile based on those floor definitions.

The Excel formula behind the number in the first square from Column #15 (“Lowest quintile return on realization”, in red font Figure 10) is this:

```
=ABS(IF/OR(((IF($C4>=N4,1,IF(AND(N4>=C4,N4<=$D4),1-(N4-C4)/($D4-$C4)),0))*$M4)=0,((IF($C4>S4,0,IF(AND(S4>$C4,S4<=$D4),(S4-$C4)/($D4-$C4),1)))*$M4)=0),0,IF(((IF($C4>=N4,1,IF(AND(N4>=C4,N4<=$D4),1-(N4-C4)/($D4-$C4)),0)))*$M4)<((IF($C4>S4,0,IF(AND(S4>$C4,S4<=$D4),(S4-$C4)/($D4-$C4),1)))*$M4),((IF($C4>=N4,1,IF(AND(N4>=C4,N4<=$D4),1-(N4-C4)/($D4-$C4)),0)))*$M4),((IF($C4>S4,0,IF(AND(S4>$C4,$S4<=$D4),(S4-$C4)/($D4-$C4),1)))*$M4)))
```

Now that I’ve explained my methodology, these are the different things I graphed, what they mean, why they conflict, and problems with this methodology and some ramifications of not being able to fully account for behavior.

**CHARTS AND DIAGRAMS—MY FORMULA APPLIED**

**Tax Savings by Nominal Quintiles**

The reason why I have a “Lowest Quintile Savings”, “… Savings per return”, “… Return on Realization” (brown columns Figure 10) is because that was the progression of my thoughts as I conducted this analysis. The very first calculation serving as the maiden voyage of my quintile conversion formula was to simply re-graph the savings earned per quintile, instead of per AGI group like I originally featured [Figure 08]. With a new way or breaking up taxpayers, the same underlying data can be represented like this:

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1. Take note that the lowest quintile floor is actually undefined, so negative income earners are included as well.
As one can imagine, the poorest quintile “saved” the least amount of money from the capital gains tax because they have the least realized capital gains with which to save tax on. This comes as no surprise given the earlier charts [Figure 06, Figure 01] that demonstrated how the highest quintile captured virtually all of the economy’s realized gains. The chart on the left shows only the first four quintiles ranked according to tax savings, with the 4th quintile being the blue line at the top. The right chart includes the highest quintile, and its dominating effect is clear.

While these graphs [Figure 12] didn’t exactly produce more information than the earlier version that graphed the same data in AGI groups [Figure 08], at least it provided a baseline from which other more meaningful variables could be measured. An added benefit was that this first stepping stone served as a reasonableness test showing there was no error in my AGI to quintile conversion formula, because these quintiles exhibit the same overall shape as before, there’s just fewer lines reflecting fewer divisions of comparison.

**Per Capita Correction**

My first bright idea to get meaningful output was to calculate the tax savings per capita, which would control for the fact that the quintiles didn’t have the same numbers of people in them. Unlike a real quintile according to the CBO (CBO: Historical, 2007)\(^3\), my pseudo quintiles did not in fact have an equal number of people in them: the population of taxpayers is certainly not uniformly distributed across the income spectrum like my simplistic assumption assumed. Without access to data with a higher sample size or less aggregate AGI groupings, however, there was no other...
practical way to make the AGI<->Quintile mapping other than by assuming a uniform distribution. Because of the lopsided distributions that differed every year according to the dynamic demographic of US taxpayers as well as the evolving quintile floors, dividing savings by number of returns would control for these misfortunate data characteristics. The following model is tax savings per capita over time [Figure 13], following the tradition of first turning the highest quintile off:

Figure 13: Tax Savings Per Capita, by Quintile

The savings per capita made sense at first glance, because while the second and middle quintiles (red and green, respectively) overlap a few times, the fourth quintile always has the highest tax savings and the poorest quintile always has the lowest tax savings, as expected. Turning on the highest quintile shows the dominant the position the highest quintile has with regard to tax savings garnered from the preferential tax treatment.

At this point I felt like I had effectively proven my hypothesis, because if most of the benefit from disparate tax treatment was concentrated more heavily in each successively higher quintile, there would necessarily be inequality effects generated. And since per capita tax savings controls for the inaccurately distributed population issue, I had covered all my bases. The highest quintile saves more money per person from the 15% top marginal bracket than any other group of people, so it necessarily follows that this unequal “realization of the benefits” is a major contributor to after-tax income inequality in America. Case closed…

Ambiguities
After giving it some thought, I realized my conclusions couldn't be more misguided. Of course
the higher quintiles will have a greater savings per capita, because those quintiles likely invested more capital in the first place upon which this law was capable of benefitting. In no way does this show that the benefits were distributed unequally, however. Perhaps every person realized the same amount of savings relative to their initial capital investment, it's just that the different initial investments are leading to easily misconstrued graphs. For example, the above graphs [Figure 11] might describe a situation where every taxpayer who filed a Schedule D form saved exactly 5% of their initial investment, which means that income inequality would not have been affected at all by the different nominal values of savings. In order for my analysis to prove that the capital gains law was contributing to income inequality, I would have to show that the higher quintiles saw a greater savings per dollar invested than some person from a lower quintile. In effect, I would have to demonstrate that the “rich investment dollar” saw a greater proportion of the overall savings than a “poor investment dollar”. If each quintile had the same savings per dollar, that would indicate the growing rate of income divergence between quintiles is not impacted as result of the tax\(^1\). If, like I predicted, the 15% capital gains rate was in fact causing after-tax incomes for the quintiles to diverge, those upper quintiles must be yielding a better return on their investment, which I hereafter use to describe the tax savings per dollar of capital realized.

**Return on Investment—Quantifying the Preference**

To calculate the Return on Investment (ROI), I needed a source on the amount of money people invested, but more specifically the money “realized” pre-tax. By dividing the amount of money realized by the amount of tax savings, I came up with “savings per dollar realized” or return on investment. Data on realizations came from IRS Table 2, which breaks down all sources of income on the individual tax return by AGI groups (SOI Table 2.1)\(^2\). The AGI declinations are a little bit different than on Table 4, so some groups had to be reflowed so the categories matched up.

In the last stage of my research, I graphed tax savings per capita by quintile [Figure 13], using my AGI to quintile translation formula. Remember, the reason I decided it was better to graph per capita was to correct for the fact that in real life quintiles have equal amounts of people (and are thus per capita by nature), but my pseudo quintile calculations contained unequal numbers of people that I tried to compensate for. With those ideas in mind, I graphed my RoI per capita as well,

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1. Remember, I'm operating on the assumption that income inequality is in fact rising, and this research is merely exploring one possible contribution to that.
and these are the results [Figure 14]:

**Figure 14: Return on Investment, by Quintile (IRS/person)**

This graph was essentially the crowning glory of my analysis.

When looking at the diagram, it is clear that between 1999 to 2007—almost the full time period in the available data—the highest quintile dominated the tax savings per investment dollar. Essentially, every dollar that some person in the highest quintile made in capital gains saw a greater “return” or benefit as result of the 15% top marginal capital gains tax than anybody else. Therefore, during these years income inequality clearly increased as a result of these tax policies because a lopsided majority of the tax savings were concentrated on the richest quintile\(^1\). This was essentially my hypothesis answered, but certain issues in the underlying data only left me with more questions.

First of all, I skipped year 2003. There was an anomaly in the data for 2003, due to the fact that the second quintile class had negative realizations prior to and then positive realizations after that date. The problem is that the calculation (the return on investment formula) is sensitive to the sizes of the denominator. In 2002 the data for the lower AGI categories—the ones making up most of the lowest and second quintile groups, was overall negative. In other words the poorest investors lost money on their investments in the year 2002. In the year 2004 those same people had net positive realizations, and 2003 was the crossover year with an average very near zero (SOI Table 2.1)\(^2\).

To be more specific, for the 659,000 taxpayers making up the $15,000-$20,000 AGI bracket in 2003, the net realizable value for capital gains was exactly $107. For context, in the years adjacent

\(^1\) And not just a nominal consideration of inequality, but a logical one.
to 2003 the net value was on average either negative hundreds of thousands or positive hundreds of thousands, so this single value of $107 constituted an extremely small denominator for the RoI formula, and ultimately I discarded that data point. On that same note, I also took the absolute value of the net realizable capital gains number when doing these calculations. Technically, and I am not entirely certain about what occurred, but some individuals in the poorest quintile saved tax dollars as result of the preferential capital gains tax despite having negative capital gains (i.e. capital loss). Without taking the absolute value some of the lines fall below zero, and it would be harder to compare the magnitude of the tax savings (which is the important part). Some of these issues and the shape of the lines themselves left me pondering.

**More Questions Raised**

For instance, why in 2008 does the lowest quintile suddenly have a greater benefit from the capital gains law? Remember, all the capital gains law does it make it so the highest marginal tax bracket is capped at 15%, compared to the 35% highest bracket on wage income (TPC: Historical). However, also remember from the definitions discussed before that all short term capital gains are taxed at the ordinary wage income rate already, so only a subset of capital gains are subjected to separate tax treatment (Hungerford, 2010). What’s also important is that just like any other type of progressive tax scale, the percentage of tax depends on the amount of income. So people with little to no capital gains income (like those in the lowest quintile prior to 2003, who even had net capital losses) couldn’t possibly be paying any substantial tax in the first place. How could a law that puts a rate ceiling on the highest tax category benefit those who realize so little or negative gains that they wouldn’t even be party to the top marginal tax rate in the first place?

This was one issue I had with the graph [Figure 14] that I couldn’t explain, because it doesn’t make sense that the lowest quintile could derive the greatest tax savings when they didn’t even have capital gains to pay tax on. Another issue that bothered me was the lack of clear succession in the amount of tax benefits, which is what I would expect. In other words, I imagined the graph would show the highest quintile at the top, the fourth quintile below that, the middle quintile below that, et cetera down to the lowest quintile seeing the least benefit.

The only theoretical way to save money on this tax treatment is if one would normally pay a rate higher than 15% had the capital gains been taxed as ordinary wages, but luckily only have to pay
a maximum 15% due to the different treatment. The reason why I would expect each successively richer quintile to get more benefit is because each successively richer quintile realizes a greater portion [Figure 06] of the capital gains, and is thus in the best position to reach above that 15% tax threshold (which exists in the ordinary tax rate schedule due to the higher brackets). Questions like these led me to experiment with some alternate ways of analyzing the data.

IN SEARCH OF ANSWERS: DATA EXPERIMENTS

**Experiment 1—Per Capita versus Per Class Grouping**

The first experiment I conducted was to throw out the per capita correction made to adjust for unequally populated quintiles. I changed the return on investment formula to simply divide the total tax savings as originally grouped by AGI by the total realizations netted by that same AGI. Instead of this being quintile groups composed from fractions of “per capita” AGI brackets [Figure 14], they were quintile groups composed of fractions of “per class” AGI brackets [Figure 15], where only the total dollars in the original data mattered. Essentially, this was closer to the original representation of the data without my applied “correction”, which may not have been a correction at all.

This is what the picture looked like now:

**Figure 15: Return on Investment, by Quintile (IRS/class)**

This is remarkably different than graph I had before [Figure 14], because now the highest quintile was not the receiver of the greatest tax benefits. In fact, this time the lowest quintile was the greatest benefactor for the majority of the years (note that most of the time this green line was actually negative, signifying that not only did the lowest quintile receive the greatest benefits, they received
the greatest benefits while also realizing negative realized gains). Furthermore, another troubling factor is that the fourth quintile effectively received the least benefit from the preferential capital gains treatment, but they certainly realized more capital gains than the middle or lowest quintiles. I think ultimately what this analysis suffers from is the fact that due to the rate on investment fraction, there is a peculiar effect where average realizations close to zero result in a far larger return on investment than logically makes sense.

Negative winnings? Makes No Sense!

Suppose a million people in the poorest quintile each lost $1,000 on the stock market in a given year, and another million people in that same quintile each yielded a positive $1,000 during the same time. The average gain for that quintile would be zero. While any tax savings that those in the positive realization group experienced on their $1,000 winnings would be substantially lower than people in the highest quintile who perhaps realized millions of dollars of gain, the fraction would yield an infinite or undefined amount of “return” for the poorest quintiles winnings. For certain situations, the averaging problem can mask the real effects the formula is intended to reveal. The only way to solve this would be to acquire more granule data, but that's not something the general public has access to for free.

**Experiment 2—New Source for Realizations**

The second experiment I performed was to find a new source of realization data which perhaps didn't suffer from the averaging problem, and I settled on the Congressional Budget Office (CBO: Historical Supplement, 2008). This was the same data source that I took the minimum quintile floor numbers from, so it only made sense to utilize more information from the same data source. Using CBO numbers for the amount realized for each “real” quintile, the same data graphed above now looks like this:

![Figure 16: Return on Investment, by Quintile (CBO Realization Data)](chart)
While these data only go to 2005, there is no anomaly year. The results are much more visually pleasing, but are very troubling for my hypothesis if correct. In this case, the highest quintile savings (orange) is practically a flat line for the seven years depicted, and it's never at the highest point. Until 2001 or so all the quintiles seem to derive the same benefit from the capital gains tax, and thereafter the second quintile sees the most benefit until 2004 when the lowest quintile sees the most benefit. When it comes to the distributional effects of the capital gains law, from 2002-2005 there's effectively a closing of the income inequality gap in America; the law distributes more benefits to the lower two quintiles than it does to the highest two quintiles. These results are at odds with the same results using a different source of realizations from the IRS, so I was left deciding which data I thought was more representative. In order to answer this question I think it's important to take a step back and go over all the components of data that are going into these two RoI graphs producing alternative conclusions [Figure 14, Figure 16].

Summary Review of Sources

First, the IRS Statistics of Income (SOI) office is the only source I found that conveniently tabulates the tax savings as a result of the disparate treatment of capital gains taxes, which is their Table 4 “alternate tax computation” analysis (SOI Table 4). Unfortunately, the IRS definition of income—the Adjusted Gross Income (AGI)—is an inaccurate representation of actual income, as discussed by Reynolds. There are deductions, exceptions, and many different circumstances that drive a wedge between a person’s “actual income” they received in any given year with the “taxable income” as seen by the IRS. However, I was stuck with this AGI definition and a division of the population into these brackets when analyzing the benefits of the alternate tax computation. Another drawback of the IRS data is that AGI brackets are not nearly as useful a classification as quintiles are, and that's where I turned to the Congressional Budget Office who calculated quintiles using their own definition of income. That definition of income is as close to ideal as I can imagine, taking in all conceivable sources of “income” including estimated guesses of the indirect effects of certain things like corporate income tax or restructuring of corporations from ‘S’ to ‘C’ and the indirect tax consequences those have on some person’s ultimate net income, which are called “imputed” taxes (CBO: Historical Supplement, 2008). This income definition is also a composite of the IRS AGI definition itself and the Census CPS survey derived from a black box statistical relationship I don't understand (CBO: Historical, 2007).
So, my contribution to the analysis was finding a way to take the IRS data on tax savings, originally delineated by imperfect AGI brackets, and hammer the data into easier to conceptualize quintiles as defined by the CBO. This would hopefully convert data from an inflexible format (AGI) and into a more logical format (quintiles from the CBO).

But what affect does mixing and matching these sources of data have on the ultimate analysis? And what is more true to nature: using IRS as a source of savings and as a source of realizations to find a savings per realization, which is then translated into pseudo quintiles from the CBO? Or using IRS as a source of savings and the CBO as a source of both the quintile definitions and the amount of realizations experienced by those very same people the quintiles reference? I believe that the latter is a truer representation, because in the first place my translation formula (and any biases it imparts) is applied to two sources of input—both the realizations number and the savings number—but in the second case translation occurs to only a single data input (the savings).

DOUBLE CHECKING WITH STRAIGHT AGI

I already decided that the CBO information was more comprehensive and well thought-out, so the more information I can use from that source the more I feel I can trust the ultimate analysis. So once again, here is a reproduction of [Figure 16], the ultimate depiction I have settled with:

This shows that, contrary to my hypothesis, the 15% top marginal capital gains tax rate has not had an after-tax income distributional affect funneling income towards the rich, at least not for the time period indicated. In fact, the latest years indicate that the preferential tax treatment actually helped the poorest people who made investments, not the richest. This would be more or less confirmed
by graphing the raw data straight from the IRS Table 4, without any of my bias correction methods or quintiles translation:

**Figure 17: Return on Investment, by AGI (IRS/person)**

This is simply the raw tax savings/realization data as classified by AGI group originally, which is the “truest to form” or least distorted source of data on this topic (as it all comes from the same source; the source with the full data sets to even make these computations [(SOI Table 4)](https://www.irs.gov/taxstats)). While it’s very hard to visually ascertain any trends in this data, which is essentially the entire purpose of my analysis in trying to morph the data into the better comparable quintiles, there is one thing undoubtedly clear: the pink line representing those people with AGI $1,000,000 or above is right in the middle of the jumbled mess of AGI brackets, doing no better or no worse than those people significantly poorer than it. In the year 2008, where all the lines appear to fray out, the most important thing is that the two AGI groups realizing the most tax savings are the dark blue and light blue groups, which correspond to the combination of people in the $5,000-$15,000 income bracket.

As best as I can tell, both utilizing this raw data and my attempt at converting it to CBO quintiles, there is at best no discernible effect on income inequality in America as result of the disparate tax treatment, and at worst a redistributing affect towards the poorest income classes.

By “worst” the context is my original hypothesis, which is that a 15% cap benefits only the richest people thereby exacerbating income inequality. There is one final issue I need to discuss which further complicates this conclusion, which is already on shaky ground. All of this analysis is based on the alternate tax computation, which assumes that if in each year the tax laws were suddenly...
different and capital gains were taxed at ordinary rates, the difference in tax savings would be ‘x’. The problem is that people’s realization behavior is responsive to changes in tax law, so it isn’t fair to just assume that everyone would have realized the same amount of taxes had the law been different.

My Results in Context: Implications of Behavioral Economics

LOCK-IN EFFECT
This topic is probably the most exciting in the field of disparate capital gains tax treatment, because it tries to predict how people would respond to the evolving legislative landscape. For instance, if everyone knew that the capital gains tax rate would be zero percent for only the next two weeks, there would be a dramatic rise in the capital gains realized during the next two weeks. This is known as the “lock-in effect”, which Bartlett does a good job of explaining:

*Capital gains are taxed only when realized... A higher tax rate on capital gains thus encourages investors to hold on to assets that have appreciated in value. The higher the tax rate in capital gains, the more pronounced this effect will be.*

(Bartlett, 1985)

This effect is inefficient, according to the Congressional Research Service, because it distorts portfolio holdings by causing some people to hold off on realizing gains due to the lock-in effect when it would otherwise be preferable to do so (Hungerford, 2010). An example of an inefficient portfolio would be to purposefully avoid a composition the investor believes would subject them to an unfavorable tax penalty (Zodrow, 1995). The lock-in effect is just one example of how realization behavior is affected by tax legislation or expected legislation, and the magnitude of this effect is important to predicting the overall change in realization associated with a raising or lowering of the capital gains tax law.

DIFFERENCES BETWEEN LONG-TERM AND SHORT-TERM BEHAVIOR
In this field of study, there has been a lot of research yielding wildly different results, and it is hard to find a conclusive consensus. However, it has been recognized that the long term behavior response is different than a short term response, i.e. there is a different behavior associated with an upcoming long term reduction in capital gains rates compared to an upcoming short term or transitory reduction in capital gains rates (Burman & Randolph, 1994). Thus “empirical research has tried to separate the transitory response from the permanent response” (Hungerford, 2010). Now, the way the response is modeled or measured is in terms of elasticity. According to the
greatest collaborative human knowledge project in history¹, elasticity is a tool for measuring the responsiveness of a function to changes in parameters in a unitless way (Wikipedia contributors: Elasticity..., 2011)³⁷. In this case, we are interested in measuring the change in the capital gains realization decision in response to a lowering of the capital gains tax.

This elasticity has interested economists because “if realizations of capital gains are responsive enough, the tax rate on capital gains could be cut at no cost to the treasury” (Burman & Randolph, 1994)⁴. Remember, it was this that the pioneering study in 1980 by Feldstein, Slemrod, and Yitzhaki predicted when they concluded that “reducing tax on capital gains would… increase tax revenue” (Feldstein, Slemrod & Yitzhaki, 1980)⁸.

**EMPIRICAL ELASTICITY STUDIES**

In this final section, I am going to review a few of the empirical findings on long term and transi­tional elasticities determined by the Feenberg and Summers study I sourced from near the very beginning of this paper (from Harvard and the NBER, respectively) (Feenberg & Summers, 1990)⁷, research conducted by Burman and Randolph on behalf of the Congressional Budget Office and the Department of the Treasury (Burman & Randolph, 1994)⁴, overviews of several studies compiled by two articles from the Congressional Research Service (Gravelle, 2003)¹² & (Hungerford, 2010)¹⁴, and the most informative source providing both an overview of the results of various studies to date and also the problems that face studies of this nature, the research conducted by George Zodrow of Rice University (Zodrow, 1995)³⁹.

In one of the first literature reviews of this paper I used Feenberg and Summers to help explain how capital gains are mostly held by the rich, and that the tax benefits of the 15% law mostly accrued to that same group. This was just an ancillary result to the heart of their analysis, which was analyzing four different proposed tax plans and the market response (or behavioral response) that would result (Feenberg & Summers, 1990)⁷. According to their single year “snapshot” analysis—which I discuss the associated problems with in a later section—when it comes to the type of securities whose realization is likely to be “stimulated” by tax reduction incentives, they find that the majority of the realizations were for capital already held at the time of the tax decrease:

…the table implies that even after five years, 75 percent of the benefits of an exclusion

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¹. If I were ever to realize my dream of citing Wikipedia in an academic paper, the final stand might as well be now.
and 80 percent of the benefits of indexation would accrue to assets that were already in place when the reform was enacted. It is clear that virtually all of the benefits of a temporary capital gains tax cut would accrue to assets that had been purchased before the reform was enacted.

(Feenberg & Summers, 1990)

In other words, an upcoming decrease in the capital gains tax rate wouldn't necessarily stimulate an increase in capital investment, it would simply cause people to realize a greater portion of the assets they had already been holding. The important message to take from this is that the transitory response to capital gains legislation is small, because most of impact is absorbed by the lock-in effect of already held assets rather than a change in the fundamental behavior in the way people buy securities (Feenberg & Summers, 1990). However, Feenberg and Summers recognized the very important problem that is the crux of this type of analysis, which is the difficulty in modeling behavior. They admit: “in keeping with most previous investigations of the issue, the incidence calculations presented here take no account of tax induced changes in behavior and in market conditions that might follow capital gains tax reforms… an assumption which is surely unwarranted” (Feenberg & Summers, 1990).

Thankfully, a lot of studies have tried to measure the actual elasticity of response due to this behavior change, so we have some indication that Feenberg and Summers weren't too far off the ball even while not accounting for it. In a paper entitled Measuring Permanent Responses to Capital-Gains Tax Changes in Panel Data, Leonard Burman and William Randolph try to reconcile the differences between the “disparate statistical estimates of the elasticity of capital-gains realizations with respect to the marginal tax rate on capital gains” that results from using different types of statistical analysis (Burman & Randolph, 1994). Their general observation was that “The elasticity of capital-gains realizations with respect to permanent tax changes is much smaller than transitory response” (Burman & Randolph, 1994). This point is agreed to in general by many different economists, including for example Piketty and Saez (the same Piketty and Saez who were criticized by Alan Reynolds) who had this to say in a rebuke to Reynolds’ criticism: “The emerging consensus is that there can be substantial responses in the short-run due to retiming of income such as realizing capital gains before a tax rate increase, but that the long-term response is small” (Piketty & Saez, 2006).
**Burman and Randolph**

Burman and Randolph constructed an empirical model capturing the statistical relationship between the capital gains some person holds (dependent variable) and a number of explanatory variables including tax changes. According to them, an individual decides “to realize capital gains… [based on] the costs and benefits of realizing gains, the size and composition of the portfolio, and preferences.” Taxes affect the costs and benefits of the selling” (Burman & Randolph, 1994). It is in this way that the capital gains tax is correlated with the decision to realize, because lower taxes would lower the “cost” associated with realizing. They were given access to “panel data” over the course of 1979-1983 that covered 11,000 individuals (Burman & Randolph, 1994). Their statistical model was very complicated in nature and partially above my ability to comprehend, but I’ve digested the meat and potatoes of their analysis into the following paragraph:

**Meat and Potatoes**

When it comes to the transitory behavior effect of capital gains tax changes, the elasticity is -6.42, which “suggests realizations [are] expected to increase by more than 6 times the percentage change in the tax rate” (Burman & Randolph, 1994). When it comes to permanent behavior the elasticity is -.18, which “implies that a 1 percent decrease in permanent tax rates would increase expected realized net long-term capital gains by approximately .18%” holding all else constant (Burman & Randolph, 1994). Despite their paragraphs of lauding these results, looking at their actual Table 2 reveals they have rather large p-values. For instance, the permanent elasticity has a p-value of .48, and the transitory elasticity has a p-value of .34. I’m not a statistics expert, but in my academic experience I’ve come to know that anything greater than .05 is less than ideal. Burman and Randolph present some convoluted trickery where they talk about p-values being significant for “the level equation and criterion function”, which to my admittedly naïve knowledge in this area appear to be specific pieces of their overall equation puzzle. Within the 95% level of confidence—the standard level of confidence for all the statistics analysis I’ve done at Cal Poly—the permanent elasticity range includes both 0 and -1, (so their -.18 could reliably be anywhere between 0 and -1) (Burman & Randolph, 1994). Basically, the important information to take from this study is not the specific elasticity values as being indicative of the real life behavior of realizations as response to tax rate changes, but the general idea that “permanent changes in the tax rate have substantially smaller

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1. See General Appendix: Panel Data
2. Because in my opinion the p-values are much too large.
effects than transitory changes”, a statement echoed by other economists such as Piketty and Saez as well as the Congressional Research Service (Piketty & Saez, 2006) & (Gravelle, 2003). On the topic of statistics, Zodrow’s Economic Issues in the Taxation of Capital Gains does an excellent job of reviewing some of the major challenges to statistical analysis of behavior.

**Zodrow: Statistical Challenges for Behavior Analysis**

As Burman and Randolph alluded to, “there is no widely accepted model of the capital gains realization decision” according to Zodrow (Zodrow, 1995). This seems pretty obvious given the vastly different results reported by researchers using various statistical methods, but it speaks to how complicated behavioral analysis is. Zodrow lists off a bunch of problems, which I’ll just briefly mention here in laundry-list format:

1. People argue about whether time-series or cross-section (following individuals) analysis is better, but emerging consensus is that Panel Data is the best of both,

2. Of the important explanatory variables that would seem to cause behavior responses, there is no good data on any,

3. The usual statistical models assume the market is in equilibrium even though behavior changes are likely to reverberate or “lag” for several years after-tax changes,

4. Modeling expectations is “inherently difficult”, and

5. These models suffer from “simultaneity” which is where the dependent variable (realization amount) influences the explanatory variables (like marginal tax rate) (Zodrow, 1995).

This last problem is something I can explain given my statistics education at Cal Poly. In a statistical model, the whole point is to measure the correlation that an explanatory variable has with a dependent variable, the dependent variable of course being that thing which depends on the explanatory variable that explains it. For example, if lifetime wealth is a dependent variable, one explanatory variable might be age. It is very likely that being older is directly associated with accumulated lifetime wealth, so we might say that age is an explanatory variable for wealth. Now, statistical models depend on this one way relationship where the explanatory variable explains the dependent; if there are “feedback effects” where the dependent variable explains a portion of the
explanatory variable, the model collapses\(^1\). This is what Zodrow is saying, and the reasoning is simple. Because of our progressive tax structure, the more income some person makes the higher the marginal tax rate that applies to them. These models are seeking to show that lowering the marginal tax rate explains some behavioral response in capital gains realization decisions, but the amount of capital gains realized necessarily determines the corresponding marginal tax rate that applies that person (Zodrow, 1995)\(^39\).

According to Zodrow there have been attempts at fixing the simultaneity problem, but none of them are foolproof. Zodrow’s paper is very helpful in outlining the many issues surrounding the latest research in the behavioral response to changes in capital gains legislation, and like some other economists I’ve mentioned, concludes that while the general consensus is that long term effects are negligible compared to short term ones, the precise elasticities coming out of studies in this area are very murky and only the collective implication can be taken with certainty (Zodrow, 1995)\(^39\). One final point that Zodrow makes that I think is worth reprinting and relevant to earlier discussions in this paper is this:

> Recent research on the distributional effects of capital gains taxes has made a compelling case that capital gains in the US accrue primarily to the wealthy; in terms of dollars of taxable gains, capital gains are not a ‘middle-class’ phenomenon by any reasonable definition of the middle class.

(Zodrow, 1995)\(^39\)

As my research has indicated, however, while looking at nominal dollar values certainly suggests that the highest quintiles both realize the lion’s share of the gains and of the tax savings, examining per capita or per dollar amounts are far more enlightening and simultaneously undermining of this basic generalization.

**The Temporary Rich: Statistical Problems Highlighted**

In Zodrow’s research conducted five years after Feenberg and Summers, he noted that the aforementioned suffers the flaws of a narrow minded data set. With respect to the fact that Feenberg and Summers only used a single year of data, Zodrow writes:

> However, such a single-year ‘snapshot’ picture of the income/gains distribution may be seriously distorted because the high income groups contain individuals with large one-

\(^1\) For example, age wouldn’t be a good explanatory variable for lifetime wealth if in some alternative universe the very wealthy were able to afford time machines to make them younger again. In this dimension, age would be correlated with wealth but wealth would also be correlated with age (insomuch as time travel technology is something only the wealthy can afford).
In other words, some of the supposedly rich individuals are actually just middle class families that happened to sell their house during the single year of analysis, thereby distorting the true concentration of income owned by the “rich” by not accounting for the “temporary rich” phenomenon (Zodrow, 1995).

Zodrow reviews the findings of three different studies that have looked into the magnitude of the temporary rich effect introduced by looking at single year data as opposed to multiyear data. This is a brief synopsis of Zodrow’s summary:

With a single year data snapshot, Feenberg and Summers concluded that the top .5% richest people by AGI accrued about 40% of realizations. Two years later, a study by Slemrod concluded that compared to the 40% result found with just one year, averaging the accruals over a 6 year period centered around Feenberg’s year increased the concentration to 52% (Zodrow, 1995). A third study done using five years in the same time period but using a different source of data that oversampled high income earners (Haliasses and Lyon), found that the single year approach showed the top 1% earned 80% of the accruals, compared to only 58% with the multiyear approach. The takeaway message from Zodrow’s review is that while “it is undoubtedly true that the occurrence of a one-time gain [house purchase] inflates measured income for some individuals… these [3] studies suggest that evaluating the distribution of gains on a multi-year basis [thus correcting for being temporarily rich by house selling] does not change the basic conclusion that gains are on average highly concentrated” (Zodrow, 1995).

**CRS Overview**

Finally, the Congressional Research Service (CRS) analyzes the potential behavioral effects on realization on a more theoretical perspective in line with basic economic concepts I’ve learned at Cal Poly. When it comes to effects on the economy, “A fiscal policy can stimulate the economy in the short run only if it increases aggregate spending” (Gravelle, 2003). One of the problems with the Bush stimulus package, for example, is that while the intentions were that people would spend the money to grease the wheels of the economy, people often just saved the check instead (Rohaly & Leiserson, 2008). As it turns out, most of the capital gains are concentrated among higher income
and wealthier people, and those are the same people who have the highest marginal propensity to save and thus won’t be stimulating the economy any time soon (Gravelle, 2003)\(^7\). For those economists that argue a lower capital gains tax will stimulate the economy by causing more people to invest, reviewed literature suggests otherwise (Feenberg & Summers, 1990)\(^7\). The Congressional Research Service report entitled *The Economic Effects of Capital Gains*, which I’ve sourced other times throughout this paper, explains it like this: “the traditional economic theory of saving, the life-cycle model, assumes that individuals make rational, far-sighted decisions. The preponderance of empirical evidence, however, does not support the life-cycle model” (Hungerford, 2010)\(^14\). In other words, while it might be rational for people to increase their capital investments as a result of a lower capital gains tax law, people are for the most part irrational. Perhaps the most concise digestion of all the behavioral research in this area is this:

*Over the years, a variety of studies have estimated different long-run or permanent realizations elasticities. The general trend has been to estimate elasticities closer to zero than to 1.0 [think of the Burman and Randolph study I mentioned before that calculated -.18] as data and estimation methods improve, though there are exceptions… While the effect of changes in the capital gains tax rate continue to be debated and researched, the bulk of the evidence suggests that reducing the capital gains tax rate reduces tax revenues”*

(Hungerford, 2010)\(^14\)

\(~\text{Final Conclusion and Summary of Findings}\)\(~

After looking over a number of journal articles and other resources which have studied the behavioral effects resulting from changes in capital gains tax laws, I think the most concrete point to gather is that while nobody really knows the exact mathematical relationships that underline this connection due to the many statistical issues inherent in this type of research (as mentioned by Zodrow), the overall consensus is that short term tax changes will stimulate people to realize capital gains they had sitting around rather than stimulate new investment, while long term tax changes have no discernable effect on realization behavior. If true, this is a very important finding for my analysis. Because my analysis is essentially “static” and depends on historical realization data remaining unchanged through a slew of different tax computations, the results are only significant inasmuch as long term realization behavior is unchanged.

For instance, if changing the tax law to treat capital gains income as equal to ordinary wage income
had wild and unpredictable effects on the realization of capital gains, my analysis on the distributional effects of that would have essentially no meaning. Since the consensus seems to be that long term or “permanent” tax changes have no overall effect, then my results won’t be significantly affected by not having modeled this behavior change. Trying to calculate the inequality produced by treating capital gains as a preferential income class as opposed to an ordinary income class certainly falls under the “long-term” tax law category, because it simply assumes that throughout US history the capital gains rate was always married to the ordinary income rate and the tax realization behavior was uniform. In contrast with the multitude of tax legislation that has been enacted throughout the decades, my static analysis poses the “what if” question of there simply being the same rate for two types of income over a long period of time, and since behavioral studies have shown that realization behavior is unchanged over a long period of time in response to different tax laws, then my analysis shouldn’t be affected by behavioral considerations.

Of course, this doesn’t exactly really lead assurance to my overall results, which are already uncertain and convoluted. But it does indicate that if my results were in fact important, at least this theoretical importance would not be significantly hampered by the difficult to model behavioral dynamic.

As a quick summary of my findings, I used IRS data on the tax savings from the preferential tax status enjoyed by capital gains compared with ordinary income, and tried to attribute these savings into income quintiles allowing for comparison against different income classes of society. Depending on various methods of organizing the numbers, I could achieve different results from the same underlying data. The graph I ended up trusting the most was using the CBO definition of quintiles as well as the CBO information on capital gains realizations, paired with the IRS data on savings which I translated to CBO quintiles using the formula I created [Figure 10] and the assumption that the population of taxpayers in AGI brackets is uniformly distributed [Figure 17].

I have concluded that with the available aggregate statistics for free public dissemination, it is extremely hard to model the inequality effects associated with this preferential tax status, so much so that I’m not certain if the capital gains taxes are actually preferential in nature. I believe with better data sources, like access to panel data over a number of years, it would be easier to calculate real quintiles for tax payers as well as a more accurate “return on investment”. I believe the distri-
butional effects of the disparate tax laws is very interesting and has important policy implications for the income inequality faced by the United States, I am just not able to determine concisely what those consequences are given the available data and my methods. According to the conclusions of hundreds of pages the research I have gathered, the preferential capital gains tax overwhelmingly benefits the wealthiest people in America—I was just unable to confirm this theory myself.
Appendix

WORKS CITED


GENERAL APPENDIX

From Footnote 1, page 08: Hidden Unrealized Gain

Now, unrealized income may certainly be a strong indication of future earnings. If no other income data was available besides the current investment portfolios of myself and Steve Jobs, it wouldn’t take a rocket scientist to deduce that Mr. Jobs likely has a higher income than me just based on unrealized earnings alone. One might also deduce that because Steve Jobs likely has millions of unrealized gains in his portfolio right now, that he likely has had millions of unrealized earnings in the past that have indeed become realized, and must enjoy a high standard of living to even afford the initial investments. Unfortunately, it’s impossible to ascertain the unrealized gains a person is sitting on at any given moment without taking a survey, because such information is not reported on individual tax returns (or even the Census CPS survey)\(^1\). This illustrates one of the many limitations of the relevant income data available to researchers today—there are often many unobservable income sources (or unobservable-yet-highly-likely-to-become real income sources) that distort any findings analyses like this produce. Unfortunately, we must work with the data that’s available.

From Footnote 1, page 09:

(Reynolds, 2007)\(^{22}\)

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<th>5. Piketty-Saez (including transfers and excluding business income)</th>
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Note: Column 2 is Congressional Budget Office data as adjusted by the author to exclude capital gains based on the percentage of income attributed to capital gains by Piketty-Saez. Columns 1, 2, 3, and 4 include business income. Columns 1, 2, 4, and 5 include transfer payments.

1. See (Census Bureau, 2010)\(^{28}\)
From Footnote 1, page 53: Panel Data

Panel data is usually not offered to the public, and you have to have connections to get it. What you get with “panel data” is individual tax payer data, which allows you to follow the same exact person through time (Burman & Randolph, 1994). In contrast to the IRS data sets I was able to download online, which showed aggregate samples of the overall population broken down into AGI categories I couldn’t change, panel data is very granule and lets you track the behavior of each person every year. This is basically the best kind of data, and they probably only got it because Randolph worked for the Treasury at the time of their paper (Burman & Randolph, 1994).