CAPITAL GAINS AND THE DISTRIBUTION OF INCOME IN THE UNITED STATES*

Jacob A. Robbins†

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Abstract

This paper constructs a new data series on aggregate capital gains and their distribution, and documents that since 1980 capital gains have been the main driver of wealth accumulation. Over this period, capital gains averaged 8% of national income and comprised a third of total capital income. Capital gains are not included in the national income and product accounts, where the definition of national income reflects the goal of measuring current production. To explain the accumulation of household wealth and distribution of capital income, both of which are affected by changes in asset prices, this paper uses the Haig-Simons income concept, which includes capital gains. Accounting for capital gains increases the measured capital share of income by 5 p.p., increases the comprehensive savings rate (inclusive of capital gains) by 6 p.p., and leads to a greater measured increase in income inequality.

Keywords: Capital gains, inequality, capital share, savings rate
JEL Classification: E01, D63, E22, E21

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†University of Illinois at Chicago, Department of Economics, e-mail: jake.a.robbins@gmail.com

1 Introduction

This paper documents a new fact: aggregate capital gains have increased substantially in the United States over the past forty years. It defines a new measure of aggregate capital gains, Gross National Capital Gains (GNKG), which quantifies the yearly increase in national wealth driven by changes in asset prices, and not by savings or investment. Capital gains are not included in the national income and product accounts, where national income is defined in order to measure current production and output. Since this paper is concerned not with production but by wealth accumulation and its distribution, we use the Haig-Simons income concept,[1] a broad concept of income that combines market and capital gains income.

The capital gains we document provide a wider and improved window to understanding three macroeconomic trends involving the measurement and distribution of income: (i) the decline in the national accounts savings rate[2] (ii) the secular increase in the capital share of income (iii) the level and trend of income inequality. We find that including GNKGs in a comprehensive savings rate shows that savings has *increased* post-1980 by 5 percentage points, reversing the conclusion that comes from traditional national accounts data. In addition, accounting for GNKGs increases the Haig-Simons capital share of income by 5 p.p., amplifying the increasing capital share (and declining labor share) documented using standard national accounts data.[3] This paper then studies how GNKGs are distributed, combining aggregate and micro-level data to create distributional tables of Haig-Simons income. We show that capital gains are extremely concentrated, and Haig Simons income significantly increases the measured share of income of the upper percentiles of the distribution, as compared to income reported on tax returns or in survey data.

To understand and rationalize the emergence of GNKGs, we explore a model in which changes in wealth are not generated solely by changes in savings or investment, but also through changes in asset prices. We build a quantitative model of the US economy that includes unmeasured investment, imperfect competition, and the trading of pure profits. Our model shows that the three primary drivers of capital gains have been an increase in market power, an increase in intangible investment, and a decline in interest rates.

Figure 1 tells the aggregate story of capital gains. The blue 'X' series is the aggregate wealth-to-income ratio in the US, where wealth is defined as the market value of all stocks, bonds, and real estate held by individuals.[4] The red '+' series is the capital-to-income ratio of the US, computed by accumulating investment through the perpetual inventory method.[5] Beginning in 1980, the two series

[1] See Haig (1921) and Simons (1938).

[2] Net private savings.

[3] See Karabarbounis and Neiman (2014) and Elsby, Hobijn and Şahin (2013).

[4] The data is from the Financial Accounts, the aggregate balance sheet of households compiled by the Federal Reserve.

[5] The data is from the BEA.

diverge. Wealth increases substantially, due to an increase in the price of stocks, bonds, and real estate. In contrast, capital remains flat, due to low rates of savings and investment. The difference between the two series is analogous to how we will measure GNKGs: whenever wealth increases without a corresponding increase in saving or investment, there is an aggregate capital gain.

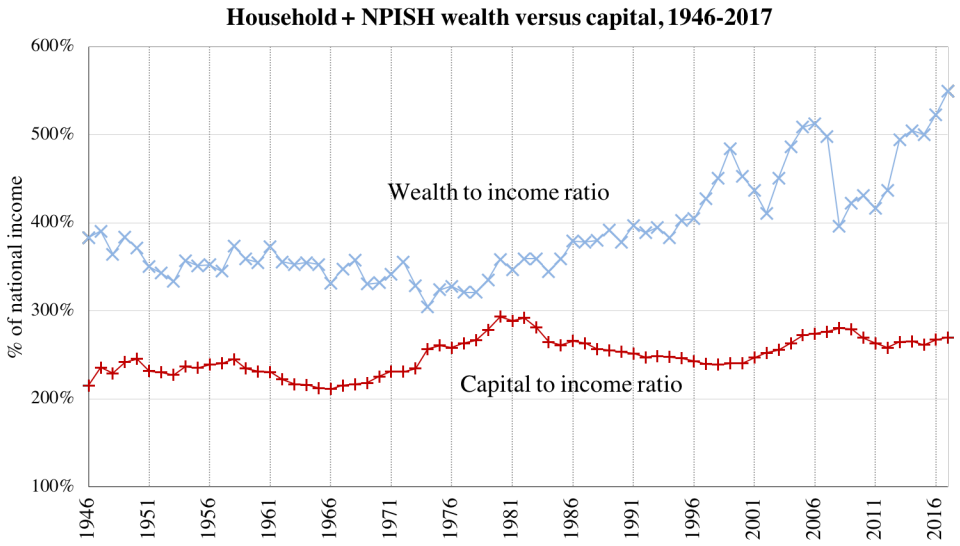

Figure 1: Trends in wealth and capital, 1946-2017. Wealth data is from the Financial Accounts of the Federal Reserve, and consists of the market value of stocks, bonds, housing, pensions, and business assets held by households and nonprofits (NPISH). Capital is the replacement value of the capital stock, computed by the Bureau of Economic Analysis (BEA). Income is net national income, from the BEA.

The economic literature contains two separate concepts of income, with each definition corresponding to a different purpose in economic theory and practice. The first school, 'income as production', defines income as equal to current output. The original national accounts were primarily created to measure production, either of consumption goods or stocks of capital. The national income concept was thus defined so as to equal production, with no place for capital gains.[6] As stated by Simon Kuznets (1947), "capital gains and losses are not increments to or drafts upon the heap of goods produced by the economic system for consumption or for stock destined for future use, and they should be excluded from measures of real income and output." There are other important drawbacks to including capital gains as income. Asset prices are highly volatile, and incorporating them would make income and savings volatile as well.

The second concept of income is 'income as well being', or Haig-Simons income. Haig-Simons income (see Haig (1921), Simons (1938), and Hicks (1946))

[6]See Landefeld (2000).

was well described by Hicks: "a person's income is what he can consume during the week and still expect to be as well off at the end of the week as he was at the beginning." In practical terms, this is measured as consumption plus change in wealth, or equivalently market income plus capital gains.[7] The contribution of changes in asset prices to welfare falls straight out of consumer theory:[8] to a first approximation, individuals are indifferent between receiving income as a dividend or as a capital gain. Importantly, as we will show below, capital gains have grown significantly as a share of national income. While there are still pros and cons to including capital gains in measures of income and savings, this change in economic reality suggests there are important things to be learned from looking at this alternative measure. To overcome the issue of volatility, we will focus our analysis on long run changes in capital gains, taking moving averages while eschewing discussion of individual years.

To measure GNKGs, we combine data on wealth from the Financial Accounts of the Federal Reserve with income and savings data from the Bureau of Economic Analysis (BEA) to create stock-flow consistent categories of assets and savings. As the calculation of capital gains necessitates valuations at market rather than book value, we make several key adjustments to the Financial Account data to move series from book to market value.

Our new data series for GNKGs shows that capital gains have grown to become a substantial and sustained component of capital income. GNKGs were small in magnitude from 1946-1980, with a mean of approximately zero. In contrast, from 1980-2017 GNKGs averaged 7% of net national income. On a yearly basis, GNKGs can be highly variable: as high as 50% of national income in the heyday of the dot-com boom, to as low as -115% of national income during the financial crisis of 2008. Over the past four decades, however, the gains have outpaced losses, making them a sustained source of income for US asset holders.

The first implication of the post-1980 upsurge of GNKGs is that standard stories about the rise of wealth in the US are missing a crucial element: the increase in asset prices. Typical models of increasing wealth focus on the declining growth rate of the economy combined with an increase in the savings rate. However, over the past forty years the wealth was not primarily accumulated by classical notions of savings and investment: it was accumulated by capital gains. And just as individuals can save out of dividends or wages, so they can save out of capital gains. We compute a new comprehensive savings rate, incorporating personal savings, corporate savings, and capital gains, and find that the traditional story of a decline in savings post-1980 is reversed. Savings *increased* post-1980; comprehensive savings averaged 11% from 1946-1982, then increasing to 16.2% from 1983-2017. It is precisely through this comprehensive

[7] Haig (1921) wrote that income is "the money value of the net accretion to one's economic power between two points of time", and Simons (1938) wrote that income is "the algebraic sum of (1) the market value of the rights exercised in consumption and (2) the change in the value of the store of property rights between the beginning and end of the period in question."

[8] See Shell, Sidrauski and Stiglitz (1969), for example, or section 2 below.

savings that the rise in wealth was accumulated.

The second direct implication of GNKGs is their effect on the capital share. GNGKs accrue to the owners of financial assets, i.e. to capital. We compute a new series for a comprehensive capital share, which includes capital gains as well as traditional capital income. GNKGs have a large effect on measured capital income, increasing the post-1980 capital share by 6 percentage points.

Finally, we study the impact of capital gains on the distribution of income. Most previous studies examine the contribution of capital gains *reported on income tax returns* to inequality. Importantly, the increase in aggregate capital gains that we document is not present in tax data on realized capital gains from the IRS. Capital gains reported on tax returns average around 3% of national income before 1980, but only increase modestly to 4% of national income from 1980 to the present. Aggregate capital gains are poorly measured in tax data for three reasons: (i) a growing share of realized capital gains are not subject to tax (ii) individuals can delay realizing capital gains, sometimes indefinitely (iii) capital gains reported to tax authorities are conceptually different than GNKGs, as taxable gains include nominal gains as well as real gains. Existing studies of income inequality that include only realized capital gains on tax returns have missed the surge of post-1980 capital gains.

To study the distributional effects of capital gains income beyond what is reported on income tax returns, we extend the Distributional National Accounts (DINAs), of Piketty, Saez and Zucman (2016) (henceforth PSZ). The DINAs contain data on the distribution of national income, which by definition does not include GNKGs.[9] To distribute aggregate capital gains, we use the same method used by PSZ to distribute capital income. For a given asset class, capital gains are distributed in proportion to an individual's holdings.[10]

We find that accounting for GNKGs significantly increases measured income inequality. The reason behind this is straightforward: since wealth and capital income are more concentrated than labor income, an increase in capital income will tend to increase top income shares. Our comprehensive income series show a large increase in top 10% and 1% shares from 1970 to the present. The top 10%'s share of income increases by 18 p.p. over the time period, compared with a 13 p.p. increase without GNKGs. The top 1%'s share increases by 14 p.p., while the share without capital gains increases by 8 p.p..

The measurement of GNKGs also contributes to the ongoing debate about whether top income shares since 2000 are being driven by capitalist rentiers (the view of Piketty) or whether they are being driven by the working rich (the view of Smith et al. (2017)).[11] Taking into account capital gains produces a story

[9] Although PSZ do not study the distribution of capital income directly, they do incorporate information from taxable capital gains in order to distribute national income.

[10] This method relies upon the assumption that, for a given asset class, individuals across the income distribution have the same expected return on assets. To the extent this is not true, and that the rich have a higher return on assets, our analysis will understate the concentration of capital gain income.

[11] Rognlie (2016) also discusses the impact of capital gains on the capital versus the labor

that contains elements of both of these views. The capital share of top income inclusive of GNKGs started increasing in the mid-1990s. By 2015, the top 10% received 55% of income from capital, while the top 1% received almost 70%.

1.1 Previous literature

Several previous papers study the magnitude of aggregate capital gains. Eisner (1989) compiles a 'Total Incomes System of Accounts', which includes revaluations in the price of tangible capital as income. Eisner (1980) estimates aggregate capital gains from the stock market. Bhatia (1970) computes capital gains on corporate stock, real estate, and livestock, and McElroy (1971) compiles capital gains for corporate equities. Piketty and Zucman (2014) and Roth (2016) provide a breakdown of savings versus capital gains for the 1970-2010 period. Rognlie (2016) emphasizes the important of housing capital gains for explaining the capital share.

This paper distinguishes itself from these prior studies in three aspects. The first is methodological. Our estimation of capital gains is part of a consistent framework that ensures no double counting of income, and embodies a stock-flow consistent relationship between wealth, national income, and savings. Second, our analysis accounts for a number of asset classes that previous work does not, such as fixed income and pension assets. In this aspect we can use a recent data source, the Integrated National Accounts, which was first published in 2006. Third, our data series extends much longer than previous work, from 1946-2017. This is important for two reasons. First, capital gains are quite volatile, and thus in order to correctly interpret their magnitude it is necessary to have many years of data. Second, with a long time series we are able to detect a change in trend for pre versus post 1980.

Two categories of papers have previously studied the distribution of capital gain income. First are studies of the distribution of *taxable realized* capital gains. In an early contribution, Liebenberg and Fitzwilliams (1961) examined the distribution of realized gains for 1958. Piketty and Saez (2003) study the distribution of income reported on tax returns, and in some specifications include capital gains. Piketty and Saez (2003) compute two capital gain series: one in which individuals are ranked using non capital gain income, but capital gains are included in the income shares, and a second series in which capital gain income is included in both ranking and income shares. Feenberg and Poterba (2000) also include capital gains in their study of top income inequality.

The second category of papers studies the distribution of capital gain income by imputing returns based on asset holdings. In an early work, Goldsmith et al. (1954) imputes retained earnings of different income groups. Bhatia (1974) examines income inequality inclusive of capital gains for 1955-1964. He estimates aggregate *nominal* capital gains for three categories of assets, corporate stock, non farm real estate, and farm assets. Then, he allocates capital gains to indi-

share.

viduals based on estimates of wealth derived from individual tax returns and the SCF. McElroy (1971) also studies the distribution of capital gains by imputing income based upon asset holdings. In a paper which is closest in scope to this current study, Armour, Burkhauser and Larrimore (2013) measure the distribution of capital income, inclusive of capital gains, using asset holding data from the Survey of Consumer Finances (SCF). For every asset class, they impute capital income using the average return of that asset class, allowing the return to differ by year.

Our paper distinguishes itself from Armour, Burkhauser and Larrimore (2013) in two aspects. The first is methodological. Our estimation of capital gains is part of a consistent framework that embodies a stock-flow consistent relationship between aggregate measures of wealth, national income, and savings. This method allows us to study the distribution of 100% of GNKGs. The second difference is the scope of our study. Our data stretches from 1946 to 2017, while Armour, Burkhauser and Larrimore (2013) have a more restricted sample of 1989-2007. We study capital gains on a wider variety of assets, including pension, retirement accounts, and fixed income assets. The greater scope and longer time period lead us to draw different conclusions from this earlier study. Our longer time series allows us to identify an important trend break in capital gains, beginning in the early 1980s. In addition, the longer data series shows that accounting for capital gains *increases* the trend in top-income inequality post-1980. This reverses the conclusion of Armour, Burkhauser and Larrimore (2013), which argued that capital gains would dampen the level and trend of income inequality. We will show that this conclusion is being driven by the endpoints of the sample. The year 1989 was a year of large capital gains, which tended to increase income inequality, while gains in 2007 were relatively modest. These two facts combine to flatten the profile of income inequality.

The paper will proceed as follows. Section 2 will introduce a simplified model of aggregate capital gains. Section 3 explains the measurement issues and data sources, and presents a time series of GNKGs. Section 4 defines aggregate Haig-Simons income and savings, and presents a data series for both of these variables. Section 5 studies the distribution of Haig-Simons income. Section **??** returns to the model to explain the empirical results.

2 A theory of capital gains

Before measuring aggregate capital gains in the data, we formally define them and explore how they relate to the income concept in the national accounts. We will show there is a close theoretical connection between capital gains, consumption, and welfare.

An agent born at time τ, with a lifespan of M years, optimizes lifetime utility $U(c_\tau, c_{\tau+1}, ..., c_{\tau+M-1})$, with $U(\cdot)$ concave and increasing. Her flow budget constraint is given by equation 1. At each time t, the agent chooses between consumption c_t and purchasing two types of assets. The first is a capital asset,

K_{t+1}, which is purchased at price q_t, depreciates at rate δ, and yields a rental rate ρ_t. The second asset is a financial asset, S_{t+1}, purchased at price X_t, which pays a dividend of d_t. The agent works, and receives labor income of $w_t l_t$. Initial asset holdings are zero, and the agent leaves no bequests.

$$c_t + q_t K_{t+1} + X_t S_{t+1} = q_t(1-\delta)K_t + S_t(X_t + d_t) + \rho_t K_t + w_t l_t \quad (1)$$

There are two distinct types of income implicit in this budget constraint.

Definition 1. *National income is equal to income from wages plus rental income from capital plus dividends from securities, minus depreciation.*

$$Y_t^n = w_t l_t + \rho_t K_t - \delta q_{t-1} K_t + d_t S_t. \quad (2)$$

National income is income received from production. If we sum equation 2 over all US residents, definition 1 is in line with the BEA definition of national income, which, absent measurement errors, equals the national production of output.[12]

Definition 2. *Capital gains for an asset class are equal to the change in the price of the un-depreciated portion of the asset. Then* $KG_t^S \equiv S_t(X_t - X_{t-1})$*, and* $KG_t^K \equiv (1-\delta)K_t(q_t - q_{t-1})$*,* $KG_t = KG_t^S + KG_t^K$*.*

Capital gains are not included in the BEA definition of national income. However, they enter in the budget constraint in the same way as other types of capital income. With no transaction costs of selling assets and perfect information, the agent is indifferent between a one dollar increase in the share price of their asset or a dollar in additional dividends.[13]

We now formally define Haig-Simons income, which includes both national income and capital gains.

Definition 3. *Haig-Simons income is equal to national income plus capital gains:*

$$HS_t \equiv Y_t^n + KG_t. \quad (3)$$

There is a close theoretical connection between Haig-Simons income and consumption:

Proposition 1. *If initial wealth is zero and there are no bequests, the average consumption of an agent over her lifetime is equal to her average Haig-Simons income:* $\sum_{t=\tau}^{\tau+M-1} c_t/M = \sum_{t=\tau}^{\tau+M-1} HS_t/M$*.*

Proof. See appendix **??** □

[12] See the BEA Handbook, Fox and McCully (2009).

[13] We formally show this in Appendix Proposition **??**.

Proposition 1 follows directly from the budget constraints. You can only spend on consumption what you make in income. It makes clear that in a standard optimization setting, the income which is mostly tied to consumption is Haig-Simons income, not national income. In fact, proposition 1 might be termed the 'ex-post exact permanent income hypothesis':[14] ex-post consumption must exactly equal ex-post income, where income in this case is inclusive of capital gains.

The dynamics of wealth accumulation are also closely tied to Haig-Simons income, which is inclusive of capital gains. We formally define wealth as follows.

Definition 4. *End of period financial wealth is equal to the market value of capital and securities:* $W_t \equiv q_t K_{t+1} + X_t S_{t+1}$.

Remark 1. *The change in wealth between two periods is equal to Haig-Simons income minus consumption:* $\Delta W_t = W_t - W_{t-1} = HS_t - c_t$.

As remark 1 shows, to understand the dynamics of wealth accumulation, it is necessary to take into account capital gains. A savings rate that excludes capital gains excludes a major determinant of wealth.

3 Measuring capital gains

In this section, we move from theory to measurement and estimate aggregate capital gains in the United States. We then compare our estimates with aggregate capital gains reported on tax returns.

We extend equation 1 to allow for multiple types of financial assets a^j, indexed by j— there is still a single type of capital asset held directly by households, as there will be in the data.

We also extend our theory to incorporate retained earnings. In equation 1 we made the simplifying assumption that all capital income is paid out to shareholders as dividends. We now remove this assumption, allowing some income to be held internal to the firm as *retained earnings*, RE_t. In the spirit of Miller and Modigliani (1961), we make the assumption that a dollar of retained earnings contributes a dollar to the market value of a firm: $p_t^j = p_t^{j,ER} + RE_t^j$, where $p_t^{j,ER}$ is the price of asset j ex-retained earning. Retained earnings are already measured as income in the BEA's definition of national income. In order to avoid double counting the income of retained earnings,[15] in our definition of capital gains we will attempt to net-out the effect of retained earnings on share prices.

With multiple types of assets and retained earnings, the budget constraint is given as

[14] See Friedman (1957).

[15] That is, once as corporate income, and once as a capital gain in the share price of the firm with the retained earnings.

$$c_t + q_t K_{t+1} + \sum_{j \in J} (p_t^{j,ER} + RE_t^j) a_{t+1}^j = \tag{4}$$
$$(1 - \delta + \rho_t/q_t) q_t K_t + \sum_{j \in J} \left(p_t^{j,ER} + RE_t^j + d_t^j \right) a_t^j + w_t l_t,$$

We modify our definition of national income to include multiple types of assets and retained earnings, $Y_t^n = w_t l_t + \rho_t K_t - \delta q_{t-1} K_t + \sum_{j \in J} a_t^j (d_t^j + RE_t^j)$, and similarly modify our definition of capital gains:

$$KG_t^j \equiv a_t^j ((p_t^j - RE_t^j) - p_{t-1}^j). \tag{5}$$

We can now proceed to our measurement equations.

Definition 5. *Gross National Capital Gains (GNKGs) equal the increase in the total value of all assets directly owned by US residents due to changes in the price of the assets, minus retained earnings from the financial assets:*

$$GNKG_t = \sum_{i \in USA} \left\{ \sum_{j \in J} KG_t^{i,j} + (1 - \delta) K_t^i (q_t - q_{t-1}) \right\} = \tag{6}$$
$$\sum_{j \in J} KG_t^j + (1 - \delta) KG_t^K. \tag{7}$$

To measure aggregate capital gains in a world of perfect data, we would have data on the individual asset holdings of all US residents along with data on the market prices of each of these assets. Often this data is not available, however there is a way to calculate capital gains indirectly, using data which is available. Rearranging the terms for capital gains from equation 5,

$$KG_t^j \equiv a_t^j ((p_t^j - RE_t^j) - p_{t-1}^j) = \tag{8}$$
$$\left[p_t^j a_{t+1}^j - p_{t-1}^j a_t^j \right] - (a_{t+1}^j - a_t^j) p_t^j - a_t^j RE_t^j =$$
$$W_t^j - W_{t-1}^j - FL_t^j - a_t^j RE_t^j.$$

Measuring capital gains boils down to measuring changes in aggregate household wealth, minus the "flows" F_t^j for the asset class, which are the net purchases during the time period.

3.1 Gross National Capital Gains

We measure equation 8 using data from the Financial Accounts (formerly the Flow of Funds), which is compiled by the Federal Reserve, as well as data from the National Income and Product Accounts (NIPAs), compiled by the BEA. The level of aggregation we will use in this paper is the 'national' level, comprising

all US residents. Our measures of income and wealth will thus include totals that are earned or held abroad, although it may fail to capture income and wealth in tax havens.[16]

The Financial Accounts compiles a national balance sheet for US residents and non-profit institutions. The Financial Accounts often cannot distinguish between household holdings and non-profit holdings, thus for all of our results we will show combined results for the two sectors. Non-profit institutions held 8% of combined wealth in 2017. For simplicity, we will refer to the combined household and non-profit sector results as simply 'household' results. For more than thirty different asset classes, the Financial Accounts provides information on the market value of the assets held, i.e. wealth $W_t^j = p_t^j a_{t+1}^j$.

The coverage of assets we include in our calculation of household wealth is similar to the concept of household net worth from the Financial Accounts, and is also in line with the concept of household wealth used in Saez and Zucman (2016). Wealth is the market value of all assets owned by US households, net of their debts. Assets include all financial and non-financial assets over which ownership rights can be enforced. It includes all pension wealth, with the exception of Social Security benefits and unfunded defined benefit pensions.

The Financial Accounts also has data on "flows", net purchases of financial assets, by asset type, i.e. $FL_t^j = (a_{t+1}^j - a_t^j)p_t^i$. We make one modification to the 'flows' in order to harmonize the data with the NIPA data. In theory, across all asset types the sum of financial flows for households should equal 'personal saving' from the NIPAs,[17] however there is a statistical discrepancy between the two measures.[18] We will use the personal savings from the NIPAs as our baseline measure of net flows, and distribute the statistical discrepancy between the different asset classes in the Financial Accounts flows in proportion to their relative magnitudes.

We can therefore measure GNKGs as the aggregate increase in the market value of household wealth beyond what is saved:

$$GNKG_t = W_t - W_{t-1} - s_t^{personal} - RE_t = W_t - W_{t-1} - s_t^{private}. \quad (9)$$

The final equality follows from the definition of private savings. GNKGs are thus measured as a residual: they are what remain after subtracting savings from changes in wealth.

There are five main categories of assets: housing, equities, fixed-income, business, and pensions and life insurance. Liabilities consist of mortgage and non-mortgage debt. The calculation of GNKGs requires that assets are at market value, and thus we make several modifications to the Financial Accounts data. First, we convert bond wealth data from par value to market value.[19]

[16] See Zucman (2013).

[17] Total flows equal personal savings (NIPA variable A071RC1) minus capital transfers paid by households and nonprofits (NIPA W981RC1).

[18] Financial accounts variable FA157005005.

[19] For the exact method, see appendix **??**. The par value of a bond is the amount it pays at maturity, and is often the initial selling price of the bond.

This is important, because declining interest rates since 1980 have tended to increase bond prices and generate capital gains.[20] Without this modification, bonds show capital losses. Second, we convert non-corporate business valuations from book value to market value. This is important, because most other data sources show an increase in the market value of closely held businesses relative to book value since the mid-1990s, perhaps due to "sweat equity" in partnerships and sole-proprietorships (see Bhandari and McGrattan (2018)). Finally, we subtract durable good wealth and deferred life insurance payments.

Data on private savings comes from the NIPAs, and consists of personal savings plus corporate retained earnings[21], minus capital transfers.[22] Figure 2 shows trends in the private savings rate. From 1946 to 1980 the savings rate was relatively stable, however since 1980 NIPA savings have been trending downward, a period during which wealth has been rising (see figure 1).

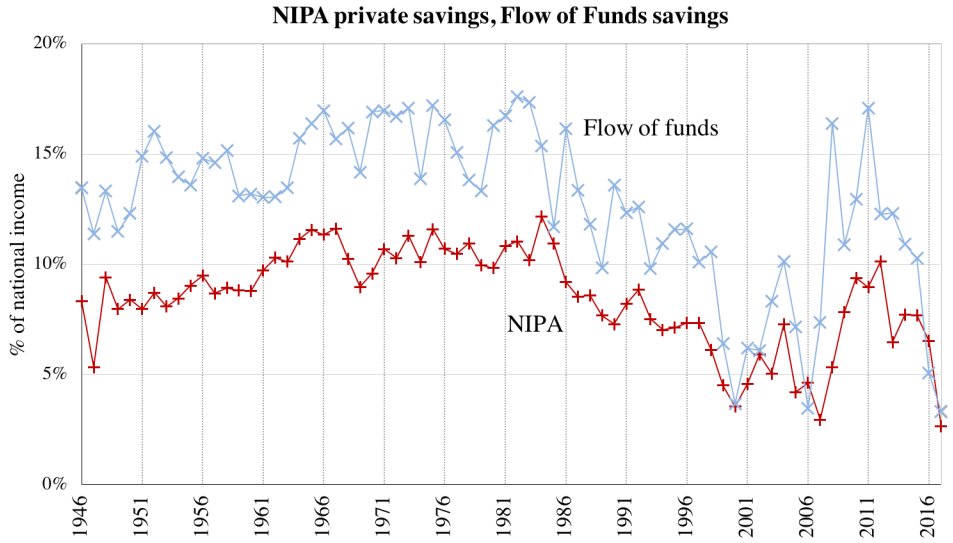

Figure 2: Trends in savings, 1946-2017. Data on NIPA savings is from the BEA, and consists of personal savings plus corporate retained earnings, minus capital transfers. Data on Flow of fund savings is from the Financial Accounts, and consists of capital expenditures plus net acquisition of financial assets plus retained earnings, less net increase in liabilities.

We calculate GNKGs using equation 9, with all nominal amounts converted to average 2010 dollars.[23] For the results in the section, we show five year moving averages of GNKGs.

[20] In fact, a large proportion of totals yield of bonds since 1980 have been due to capital gains, not yield to maturity. See Dobbs et al. (2016).

[21] NIPA varaible A127RC1.

[22] Including net transfers paid by corporations, W976RC1.

[23] We denote W_t as the end of period market value of wealth, thus we must convert these to mid year prices.

Figure 3 shows our main result for aggregate capital gains. The most striking result is a large increase in the mean and variance of capital gains starting around the year 1980. Looking at broad trends in the time series, figure 3 can roughly be divided into three eras. In the first era, from 1946-1968, there are moderate capital gains of 2% of national income per year. In the second era, from 1969-1982, there are moderate capital *losses* of 3% per year. In the final era, from 1983-2017, there are large capital gains averaging 8% per year.

Until the early 1980s, capital gains were small in magnitude, averaging less than 1% of national income per year. That is not to say there weren't individual years with moderate capital gains, however on the balance years of capital losses netted out the gains. Beginning in the early 1980s, capital gains increased in magnitude. During the 1990s internet boom capital gains boomed as well, and during the financial crisis of 2008 there were massive capital losses. Since 1980, however, capital losses have outpaced the gains. A stark representation of this is present in figure 1. Until 1980 the path of wealth followed the path of capital, but starting in 1980 wealth diverged and has not come back.

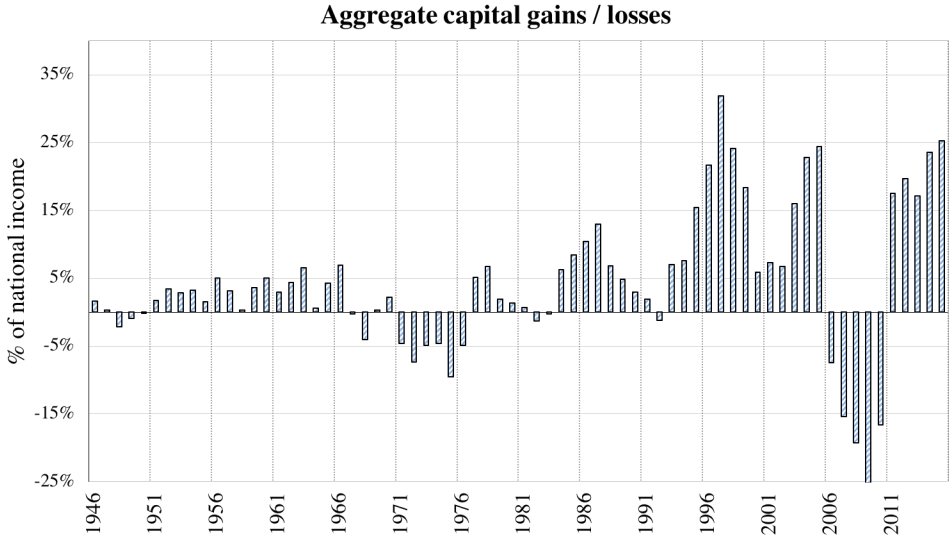

Figure 3: Aggregate capital gains, 1946-2015. GNKGs calculated as the real increase in the market value of wealth, minus net private savings. See equation 9. Data on wealth is from the Financial Accounts, data on savings is from the BEA.

3.2 Capital gains reported on tax returns

The long-run increase in measured capital gains using aggregate data (depicted in figure 3) *is not present* in individual level income-tax data on realized capital gains reported to the IRS. Realized capital gains reported on tax returns are only a fraction of GNKGs, and they show only a moderate change in trend post

1980. The absence of capital gains from tax returns has likely concealed their macroeconomic importance, as well as their contribution to income inequality.

There are two strands of literature that measure the distribution of capital gains on tax returns. The first strand studies the distribution of capital gain income that is a part of adjusted gross income (AGI) (see, for example, Feenberg and Poterba (2000) or CBO (1992)). Measuring capital gains using this method is straightforward but theoretically problematic, because in the past the tax code allowed for a significant portion of realized capital gains to be 'excluded' from AGI. When a capital gain is excluded from AGI, the individual does not pay tax on the gain. From 1942-1978, 50% of capital gains were excluded, and from 1979-1986 60% were excluded. For example, in 1978, an individual with a realized capital gain of $100 will report the $100 on Schedule D, line 6. However, only $50 will be reported as AGI on form 1040. In recent years excluded gains are less of a problem: from 1987 to the present, 100% of capital gains are in AGI.

Figure 4, red '+' series, displays realized capital gains in AGI on individual tax returns. All series in the figure are mid-point moving averages, to better serve as comparison to the GNKG series. This series does display an upward trend, but a significant portion of the trend is due to changes in tax laws that changed the amount of capital gains excluded from AGI in 1987.

The second strand of the literature studies the distribution of capital gains reported on Schedule D of individual tax returns (this includes Piketty and Saez (2003)). Schedule D includes capital gains that are included in AGI, as well as those that are excluded but are still reported on the tax return. Figure 4, blue 'X' series, shows capital gains reported on Schedule D of individual income taxes. Schedule D capital gains averaged about 3% of national income before 1980, and increase modestly to 4% of national income from 1980 to the present.

In order to compare these tax based measures to our aggregate measure, we make one adjustment to the schedule D series. There are several categories of capital gains that realized by individuals but are excluded even from schedule D. This includes, for example, a significant portion of capital gains on the sale of primary residences. Since 1997, up to $500,000 of capital gains on the sale of a primary residence are exempt from tax. Individuals that don't owe any tax on the sale of their home do not need to report the sale to the IRS. We estimate these further excluded capital gains using the following method:

1. The size of the 'tax expenditure' for each category (e.g., exemption for the sale of primary residences) of excluded gains is taken from the Joint Committee on Taxation's yearly estimate (see on Taxation (2008)). This yields the estimated tax revenue that capital gain category would have yielded in the absence of the exemption.

2. We use the average tax rates, in combination with the tax expenditure, to back out the size of the capital gains not reported on Schedule D.

Figure 4, teal circles, shows the sum of Schedule D capital gains plus these

Schedule D exclusions. This modification is important for the post 1997 period, when housing capital gains increase substantially. 'Schedule D + Exclusion' capital gains average 3% of national income for the 1954-1979 period, increasing to 4.6% of national income from 1980-2012.

Figure 5 compares GNKGs with the 'Schedule D + exclusions' series. Aside from the differences in trend noted above, there are also stark differences in the magnitude of capital gains reported on tax returns and the level of GNKGs computed from aggregate data. For example, in 2012, total GNKGs calculated using aggregate data were $2.5 trillion, while on individual tax returns ('Schedule D +') only $871 billion in capital gains were reported.

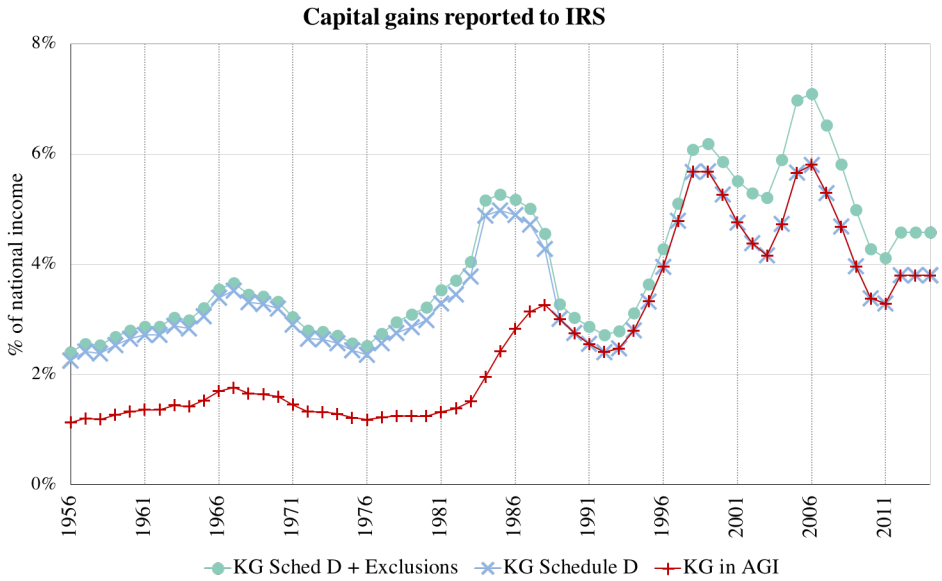

Figure 4: Capital gains included in adjusted gross income (AGI) of form 1040 of individual tax returns, capital gains reported on Schedule D of form 1040, and capital gains reported on Schedule D plus estimates of excludable capital gains. All series are five year mid-point moving averages.

There are three reasons why the patterns for GNKGs are not mirrored in the tax data. First, tax return capital gains are conceptually different than aggregate capital gains, as they include nominal gains and retained earnings. Individuals pay taxes on nominal capital gains, while purely nominal gains are excluded from the definition of GNKGs. In addition, GNKGs are calculated net of retained earnings, while taxable capital gains will include gains from any increase in the market value of equities that is due to retained corporate earnings. Thus in eras of high inflation and high retained earnings there will be high taxable capital gains, but not necessarily high GNKGs. Figure 5, red '+' series, shows aggregate nominal capital gains, defined as simply the yearly change in the market value of household wealth minus personal savings, without adjustment for retained earnings or inflation. Due to the presence of inflation nominal capital gains are large in value, trend upwards until 1980, and have no trend from 1980

to the present.

Second, a growing share of realized capital gains are not subject to the individual income tax, and thus do not show up on tax returns. Pension and IRA capital gains are not reported on tax returns. In addition, a growing proportion of total wealth are held by non-profits, and thus are not subject to tax. Figure 5, purple triangle series, estimates the flow of nominal capital gains that are subject to tax. While before the 1960s most capital gains were subject to tax, since then a gap has appeared between taxable and non-taxable capital gains. Overall nominal taxable capital gains do not display a trend over the time period.

Third, individuals can delay realizing capital gains, sometimes indefinitely. Capital gains are only taxed when they are realized, and thus the time path of realized capital gains does not necessarily match the path of accrued capital gains. Even upon death capital gains are not taxed. Instead, the tax basis of the deceased's assets is stepped up to the market value at the time of death. When heirs eventually sell the inherited asset, they only pay capital gains tax on the difference between the value when inherited and the sale price. Of the capital gains that were realized in 2012, the majority were for long term transactions, those with a holding period of more than one year. And of the long-term transactions, over 50% had a holding period of more than five years.

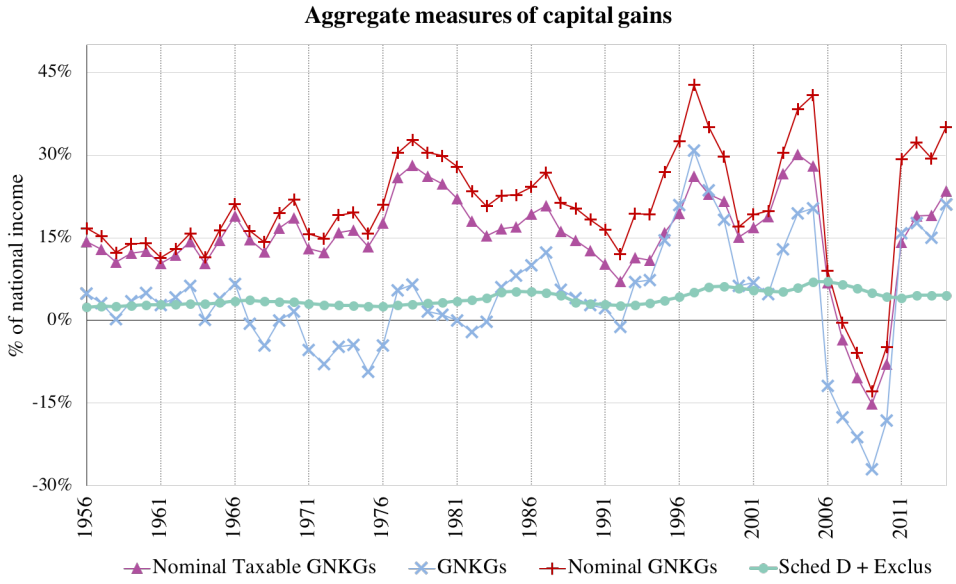

Figure 5: GNKGs, nominal KGs , nominal taxable KGs, and Schedule D based measures of capital gains. GNKGs calculated as the real increase in the market value of wealth, minus net private savings. See equation 9. Nominal capital gains are the nominal increase in household wealth. Taxable capital gains equal nominal capital gains minus gains that are not subject to capital gains tax. 'Schedule D + exclusion' capital gains equal the total amount of capital gains reported on Schedule D of individual tax returns plus estimated exclusions. All series a five year mid-point moving averages.

Prior research consistently shows that capital gains reported on tax returns captures only a small fraction of total capital gains. Bourne et al. (2018) link federal estate tax returns from decedents in 2007 to panel data on income tax returns prior from 2002-2006. Although this was a period of very high returns in the stock and housing markets, the majority of wealth individuals reported *nominal* returns on capital to the IRS of less than 2%. Steuerle (1985) and Steuerle (1982) also provide evidence that realized capital gains bear little relation to actual returns.

The above analysis explains why taxable capital gains are not a good measure of GNKGs, and lend support to our method of studying the distribution of capital gains in section 5.

3.3 Capital gains by asset class

GNKGs can also be computed by asset class. The Financial Accounts breaks down wealth and saving into stock-flow consistent groups, and we combine them into five main categories of assets. Using equation 9, we calculate capital gains by asset class. For housing, we subtract mortgage capital gains from gross housing, and for fixed income, we subtract capital gains on debt. Figures **??** displays GNKGs by asset class. By far the largest component of GNKGs are capital gains on equities and housing, while pensions are a growing source of capital gains post 1980.

4 Measuring Haig-Simons income

In this section, we compute our estimates of Haig-Simons income, Haig-Simons savings, and the Haig-Simons capital share.

We define our aggregate measure of Haig-Simons income using equation 3.

Definition 6. *National Haig-Simons Income (NHSI) is the sum of National Income and Gross National Capital Gains:* $NHSI_t = Y_t^n + GNKG_t$.

The first component of this is 'national income'. In our theoretical model, national income to equal the sum of labor income, dividends, and retained earnings. We call this 'national income' because it aligns well with how the BEA measures aggregate national income in the data.

National income is a concept very closely tied to production. We briefly describe this measurement process, in the context of the national accounting system. Gross national product (GNP), Y_t is the amount of output produced by US citizens. Gross national income (GNI) is the amount of income from production received by US citizens, and is measured as the sum of payments to labor, $w_t L_t$, net operating surplus, $Y_t - w_t L_t - \delta K_t$, and consumption of fixed capital, δK_t. As their definitions make clear, GNP is equal to GNI, although they are computed using different data sources so there is sometimes a discrepancy. Net operating surplus consists of the sum of two types of capital income: dividends

d_t, and retained earnings, RE_t. Net national income, which we will refer to as national income, equals gross national income minus depreciation.

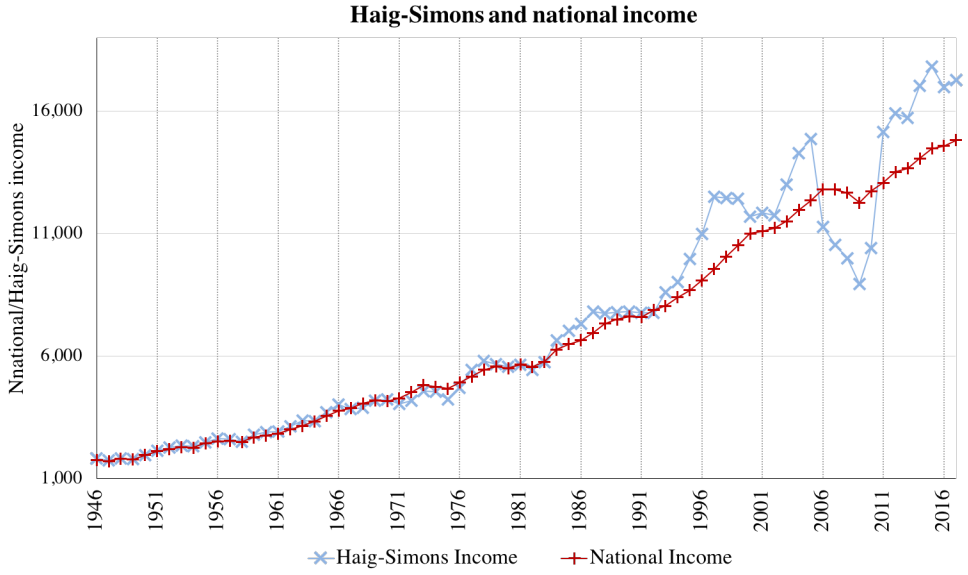

Figure 6: Haig-Simons and national income. Haig-Simons income equals national income plus gross national capital gains (GNKGs). Data on national income is from the BEA. For the construction of GNKGs, see section 3.

We use NIPA data on national income[24] along with GNKGs calculated in section 3 to measure NHSI. Figure 6 presents the time series from 1946-2017, in constant 2010 dollars, and compares the series to national income. Haig-Simons income tracks national income until the early 1990s, when it begins to diverge. From 1990-2017 Haig-Simons income is mainly above national income, with the exception of the years of the financial crisis around 2008.

4.1 Haig-Simons savings

Definition 7. *Haig-Simons Savings (HSS) is the sum of net private savings and GNKGs:* $s_t^{HS} = s_t^{private} + GNKG_t$. [25]

We calculate HSS using data on private savings from the NIPA. Figure 7 presents the time series of Haig-Simons savings from 1946 to the present, and shows as a comparison group net private savings from the NIPAs. The pattern for HSS is at odds with the traditional story of a post-1980 decline in savings. The HSS rate does not decline post 1980s, as NIPA savings does, but *increases* in magnitude. When individuals accrue capital gains in the stock and housing markets, they hold on to them, serving as an engine of wealth accumulation.

[24] Series A032RC1.

[25] In previous literature, capital gains are sometimes referred to as "passive savings". See also the "comprehensive savings" of Eisner (1980).

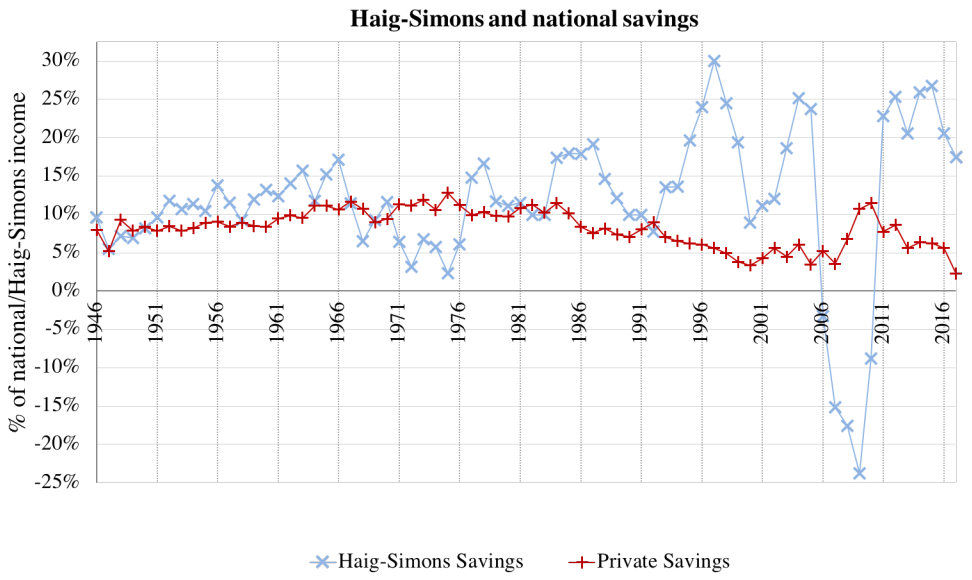

Figure 7: Haig-Simons saving and net private saving. Haig-Simons saving is the sum of net private savings and GNKGs. Data on net private savings is from the BEA. For the construction of GNKGs, see section 3.

Figure 8 compares the magnitudes of the two vehicles of wealth accumulation, savings and capital gains, throughout the three eras. In the first two eras, savings drove the increase in wealth. However, in the third era, wealth was accumulated on the back of GNKGs.

Our finding of a post-1980 rise in GNKGs dovetails nicely with the strand of literature that tries to understand the post-1980 decline of the personal savings rate in the United States. Juster et al. (2006), using panel data from the PSID, finds that the decline in personal saving is largely due to capital gains from corporate equities. This is consistent with other studies, such as Bostic, Gabriel and Painter (2009), that find moderate effects of a rise in wealth on consumption.

4.2 Haig-Simons capital share

GNKGs accrue to the owners of financial assets, i.e. to capital. If a firm's market value increases, this is income to a firm's owners and not to its workers. The rise of GNKGs since the 1980 shown in figure 3 thus has immediate implications for the level and trend of the capital share of income. A growing literature (see, for example, Karabarbounis and Neiman (2014) and Elsby, Hobijn and Şahin (2013)) documents a declining labor share of income in the US, and a corresponding rise in the capital share. This literature measures capital income using NIPA income, and does not account for capital gains.

Definition 8. *The Haig-Simons capital share of income equals NIPA capital income plus GNKGs, divided by Haig-Simons income.*

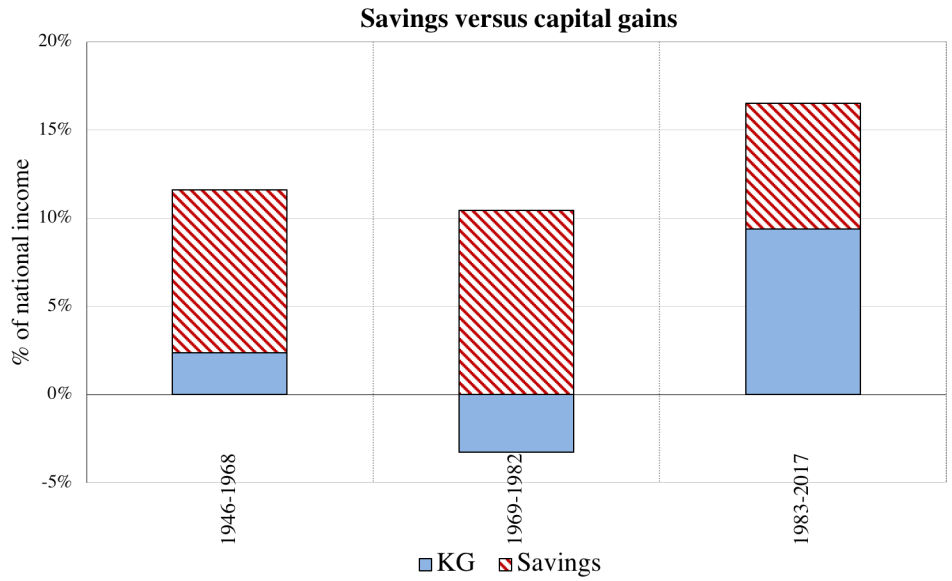

Figure 8: Capital gains: three eras. Savings is net private savings is from the BEA. For the construction of GNKGs, see section 3.

Figure 9 shows two measure of the capital share for the US. The first is a traditional measure, without capital gains, derived from national account data on capital income. Capital income is the sum of corporate profits, income from owner and tenant occupied housing, and the capital component of non-corporate income.[26] We divide capital income by factor-price national income to yield the capital share.[27] This measure, in line with the literature, shows an increasing trend, from 21% in 1980 to 26% in 2017.

The second measure of the capital share incorporates capital gains. We add GNKGs to NIPA capital income, and take as the denominator factor-price Haig-Simons income.[28] This measure shows an even larger increase post-1980, from 22% in 1980 to 38% in 2017. The large GNKGs post-1980 ensure that in the absence of a deep recession the capital share of Haig-Simons is above the NIPA capital share. Figure 10 compares the two measures of the capital share for the post 1983 period. Capital gains in the stock and housing markets push up the Haig-Simons capital share to 28% of national income, a quarter of which originates from GNKGs.

[26] We assume that 30% of mixed income is labor. Our analysis in this section is robust to other assumptions about income shares.

[27] Factor price income equals national income, minus production taxes, plus subsidies, minus net government profits.

[28] Equal to factor-price national income plus GNKGs.

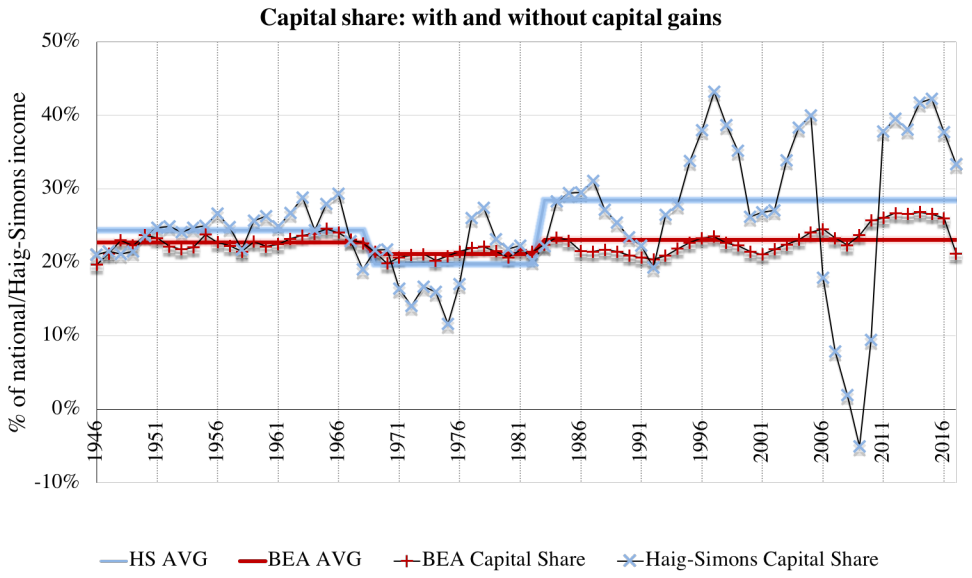

Figure 9: Capital share, with and without capital gains. BEA capital share is the sum of corporate profits, income from owner and tenant occupied housing, and the capital component of non-corporate income, divided by national income. Data is from the BEA. Haig-Simons capital share is BEA capital income plus GNKGs, divided by Haig-Simons income. For the construction of GNKGs, see section 3. For the construction of Haig-Simons income, see section 4.

5 The distribution of Haig-Simons income

We now turn to the question of the distribution of capital gain income. Section 3 documents substantial capital gains for the post-1980 period, capital income which has the potential to influence the measurement of income inequality.

While there is disagreement about whether capital gains should be included in income for the purpose of measuring aggregate output, theoretically there are good reasons for including capital gains when measuring income inequality. When restricted to annual measures of income, the Haig-Simons concept is widely agreed to be the ideal measure of income (see JCT (2012)); it is the embodiment of the Hicksian notion that income is what you can spend while keeping capital intact.[29] Section 2 shows the close theoretical connection between Haig-Simons income and individual utility.

While Haig-Simons may possess theoretical merits, it has several practical drawbacks. Aggregate capital gains are extremely volatile, an embodiment of

[29]When not restricted to annual measures, in theory the ideal income concept is the lifetime, or permanent, income (see, for example, Auerbach, Gokhale and Kotlikoff (1991) and Fullerton and Rogers (1993)). Measuring lifetime income inequality is quite difficult, however, due to the lack of long time series on individual income (exceptions include Guvenen et al. (2017) and Gustman and Steinmeier (2001)). Due to these limitations economists and tax policy have generally taken an annual approach to measuring income.

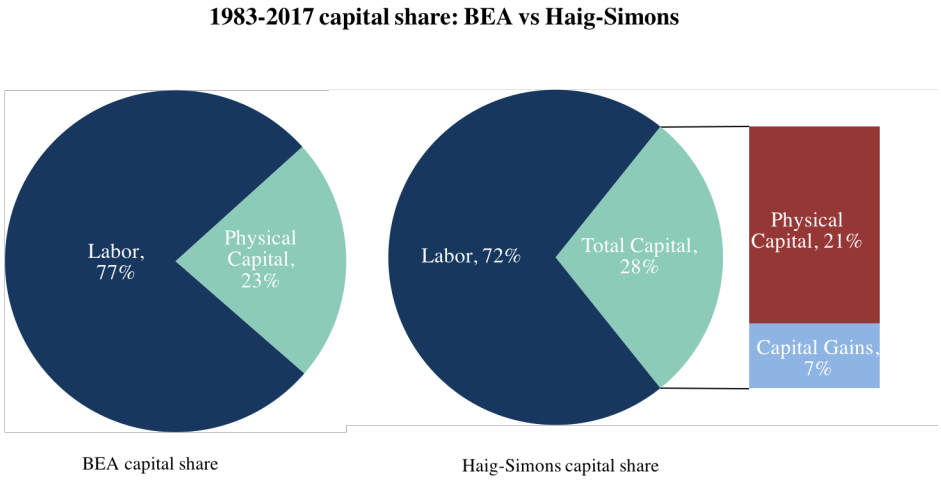

Figure 10: Post-1983 capital share comparison. BEA capital share is the sum of corporate profits, income from owner and tenant occupied housing, and the capital component of non-corporate income, divided by national income. Data is from the BEA. Haig-Simons capital share is BEA capital income plus GNKGs, divided by Haig-Simons income. For the construction of GNKGs, see section 3. For the construction of Haig-Simons income, see section 4.

the stock and housing markets which drive them. This volatility poses a challenge for measuring and interpreting trends in Haig-Simons income inequality. In years when the stock and housing markets boom, top-income shares increase, as capital gains are very concentrated. In turn, during stock market crashes, top-income shares drop. Volatility of measured inequality in and of itself is not a problem, as long it accurately reflects the volatility of individual wellbeing. It might be argued that in years in which the stock markets declines, the top of the distribution do in fact suffer welfare losses in proportion to the market. During the financial crisis of 2008, the wealth of the richest individuals in the US was almost cut in half.[30]

In another sense, however, single year movements in asset market prices are not a good measure of individual well-being. Most individuals have an investment horizon that is significantly longer than one year. The 2016 Survey of Consumer Finance (SCF) asks individuals for the reasons why they save and invest. The 5 top choices for savings all point towards a longer term investment horizon: for retirement (33% of individuals), precautionary savings for emergencies (24%), in order to make a bequest for children (7%), for children's education (6%), "for the future" (5%). The SCF also asks individuals directly what their saving and investment horizon is: 69% have a horizon greater than one year,

[30]For example, Warren Buffet's fortune fell from $62 billion to $37 billion, and likewise Bill Gates's net worth dropped from $58 billion to $40.

while 42% have a horizon more than 5 years. For the purposes of achieving these long term goals, it is the returns over the holding period that matter, not returns in individual years. For this reason, we will focus our analysis on longer run changes in capital gains, by using a five year moving average of capital gains.

5.1 Distributing GNKGs

The starting point of our analysis is data from the Distributional National Accounts (DINAs), a micro data source with information on the distribution of national income and wealth from 1946-2016. The DINAs encompass data on the distribution of national income,[31] but not GNKGs. To compute the distribution of Haig-Simons income, we need to estimate the distribution of GNKGs.[32]

The advantage of the DINAs over previous studies is they capture the total distribution of aggregate national income, not only the income reported on tax-returns or reported to surveys. A large percentage of national income doesn't show up on individual tax returns, including implicit rents on housing, the retained earnings of corporations, and employer fringe benefits. Figure 11 shows the relationship between the micro-data of the DINAs and the macroeconomic aggregates from the national accounts. Total income in the DINAs sums to national income from the NIPAs, and total wealth sums to aggregate wealth from the financial accounts.

The advantage of Haig-Simons income over the DINA's pre-tax income concept is it captures capital gains not included in the NIPA concept of national income. The red portion of figure 12 reproduces a figure from Piketty, Saez and Zucman (2016), and shows that only a third of capital income is reported on personal tax returns. The blue area of 12 shows the DINAs are still missing a key component of capital income, GNKGs.

In an ideal world, GNKGs could be measured through individual level data on specific asset holdings.[33] Since this data is not available for the United States, we distribute capital gains using the same method Piketty, Saez and Zucman (2016) use to study the distribution of (non capital gain) capital income. The method works as follows. First, for each asset class, we compute the macroeconomic yield of GNKGs by dividing the flow of aggregate capital gains by the total value of the corresponding asset. For example, for equities we will divide total capital gains on stocks for a given year by the total value of the stock market (see equation 10). We then multiply individual wealth holdings by the macroeconomic yield to compute individual capital gain income (see equation 11). This procedure ensures that individual capital gains sum to aggregate GNKGs.

$$Yield_t^j = GNKG_t^j / W_t^j \tag{10}$$

[31] For a overview of the DINA data, see appendix **??**.

[32] We will use the original DINA results as the main comparison data for our Haig-Simons series.

[33] In addition, data would be needed on the retained earnings of the underlying securities for equity holdings.

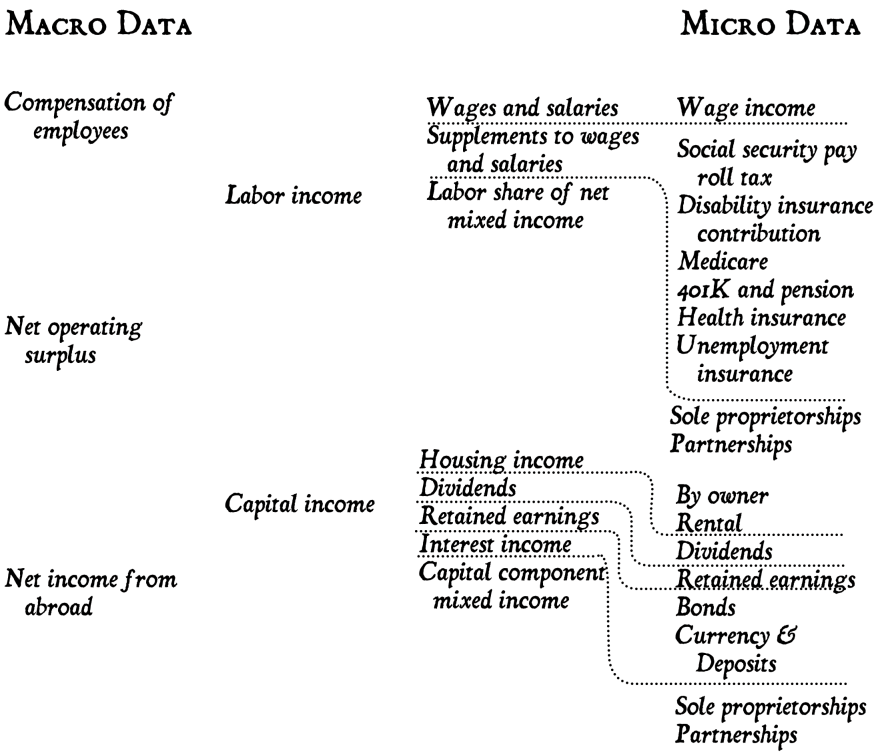

Figure 11: DINAs: National Income from macro to micro data.

$$\widehat{GNKG}_t^{i,j} = Yield_t^j \cdot W_t^{i,j} \tag{11}$$

Our method of distributing capital gains relies upon the crucial assumption that for a given asset class, individuals across the income distribution have the same expected total return on assets. To the extent that this is false, and richer individuals have higher returns, we will tend to understate the amount of capital gains inequality. To the extent that richer individuals have lower returns, we will tend to overstate the amount of capital gains inequality.

5.2 Top income shares

Figure 13 shows two series for the top 10% share of income. The first, the red '+' series, is the DINA baseline. It shows, first, a decline in the top 10% income share from 1946-1970 from 37% to 34%, and then a subsequently rise until a present share of 46%. The decline and subsequent rise in income shares is fairly smooth, and there is fairly little pro-cyclicality in top income shares.

The blue 'X' series shows the distribution of Haig-Simons income. For our baseline series, we rank individuals on Haig-Simons income, and compute shares of Haig-Simons income. There is a larger increase in the top 10% share

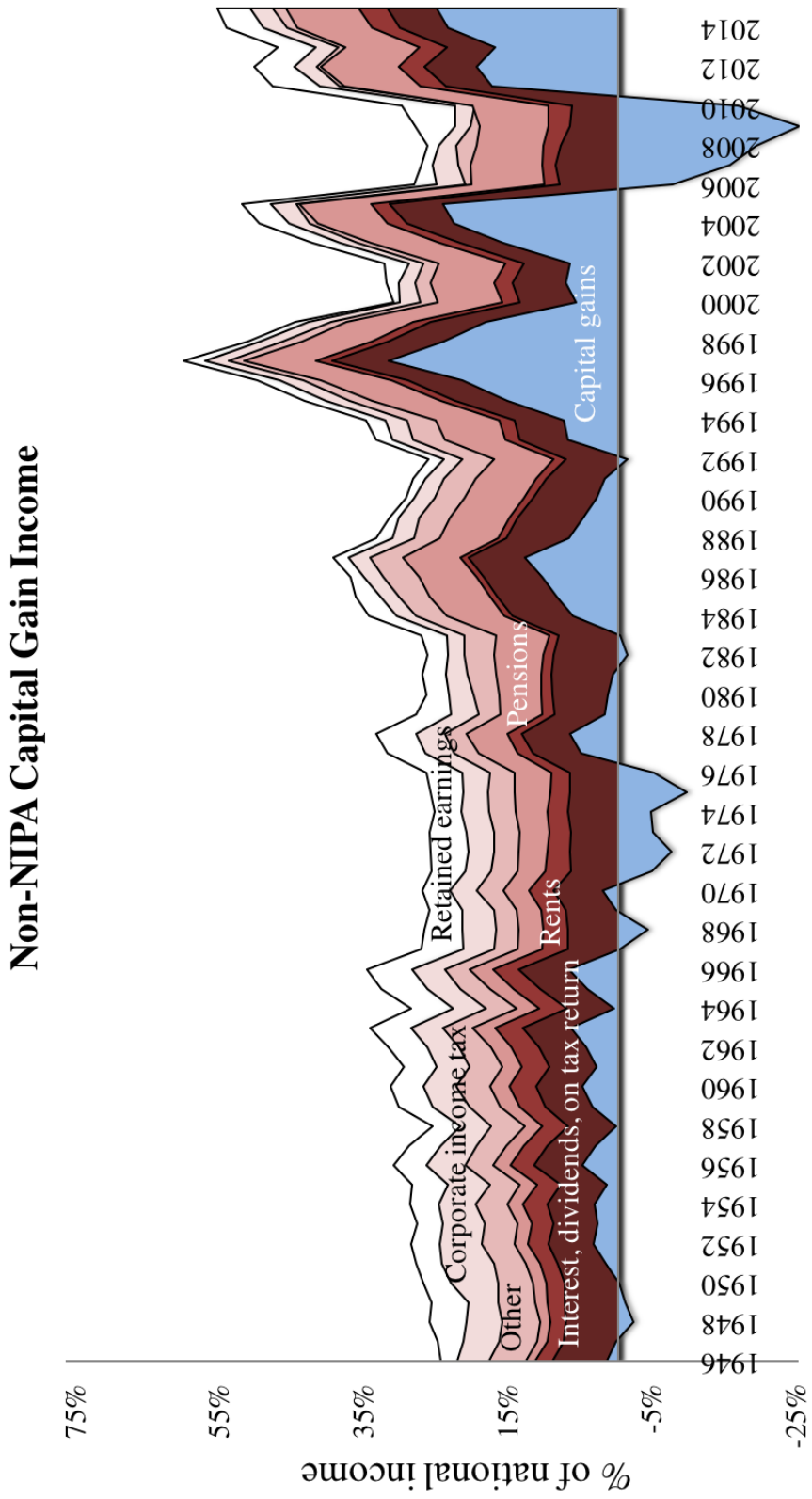

Figure 12: Capital income: taxable income, national income, Haig-Simons income. Red and white parts of the figure adopted from Piketty, Saez and Zucman (2016). The blue area is GNKGs. For the construction of GNKGs, see section 3.

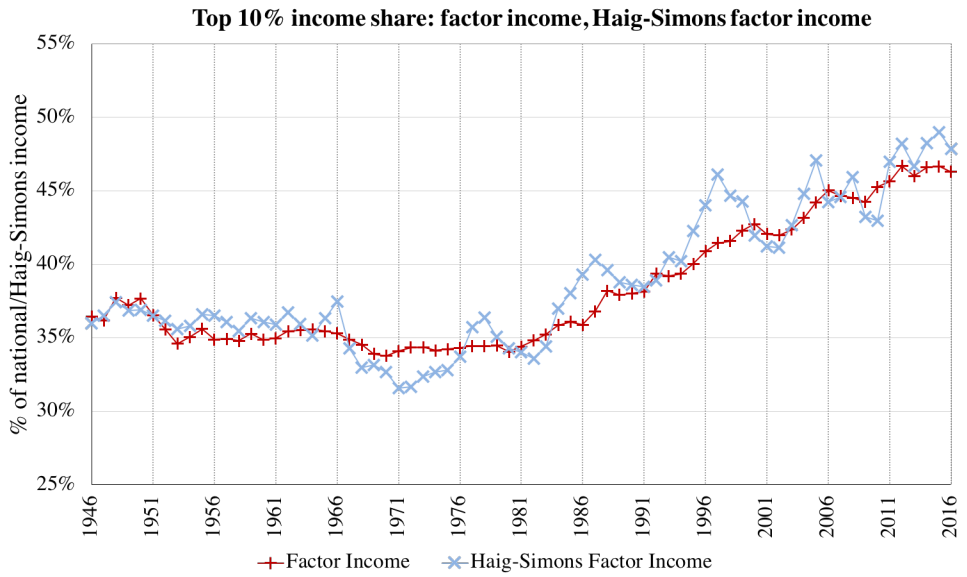

Figure 13: The top 10% share of income. Factor income series is from Piketty, Saez and Zucman (2016), and is the percentage of factor national income received by individuals in the top 10% of the income distribution. Haig-Simons factor income series is the percentage of Haig-Simons income received by individuals in the top 10% of the income distribution.

post-1970, from 31% of income to 48%. In addition, Haig-Simons top income shares are more pro-cyclical than national income. This is unsurprising, since as figure 3 shows, Haig-Simons income inherits some of the pro-cyclicality of stock and housing market prices. In periods of recession, the top 10% share drops precipitously. The overall picture is, however, that Haig-Simons income is even more unequally distributed than National Income, and there has been a larger increase over the time period.

Figure 14 shows a similar story for the top 1% share of income as for the top 10%. For national income, there is an increase from 11% in 1970 to 19% in 2016. For Haig-Simons the increase is larger, from 8% to 20%. In addition, the top 1% share of Haig-Simons income is much more pro-cyclical, dropping precipitously during the dot-com crash and the great recession.

5.3 Capital share of top income groups

Top income shares can be decomposed into a labor income share and a capital income share, just as total national income and Haig-Simons income was analyzed in section 4.2. For NIPA income, labor income consists of compensation of employees, and the labor component of mixed income. Capital income is the sum of corporate profits, income from owner and tenant occupied housing, and the capital component of non-corporate income. For Haig-Simons income, we add capital gains to the numerator and the denominator of the capital share.

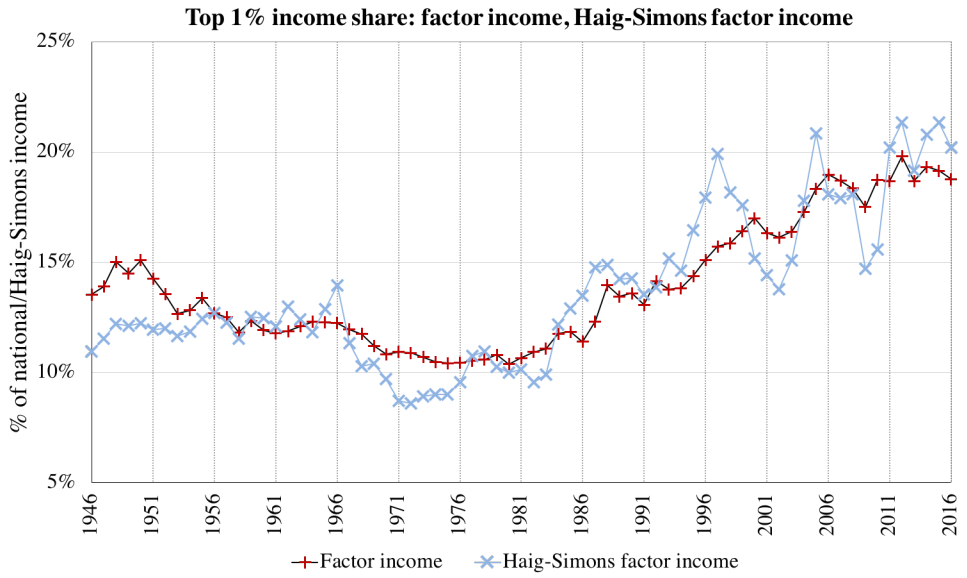

Figure 14: The top 1% share of income. Factor income series is from Piketty, Saez and Zucman (2016), and is the percentage of factor national income received by individuals in the top 1% of the income distribution. Haig-Simons factor income series is the percentage of Haig-Simons income received by individuals in the top 1% of the income distribution.

Figures 15 and 16 shows the capital share of the top 10% and top 1%, respectively, of the income distribution. The Haig-Simons capital share is depicted by blue 'X' series, while the national income capital share is the red '+' series. The red series show, in line with Piketty, Saez and Zucman (2016), that until 2001 the rise of top income shares was mostly a labor-income phenomena. After 2001 capital shares increased, and henceforth drove the large increase in income inequality.

The blue series shows the capital share for top income groups. Rather than a gradual decline in the capital share seen in the DINA series, there is a sharp decline in the late 1960s and early 1970s. In the 1980s and 1990s the capital share recovers. During the dot-com bust and great recession, the capital share dropped precipitously, as asset market prices crashed during these recessions.

6 Conclusion

Our analysis shows that prior to 1980, increases in household wealth were largely driven by the forces of accumulation, through savings and investment. After 1980, the role of savings diminished, and the increase in wealth was largely generated through the appreciation of asset prices. We quantify the increase in asset prices through an aggregate measure of capital gains, Gross National Capital Gains. Our theoretical analysis shows a close connection between capital gains, consumption, and welfare, which motivates us to explore the implications

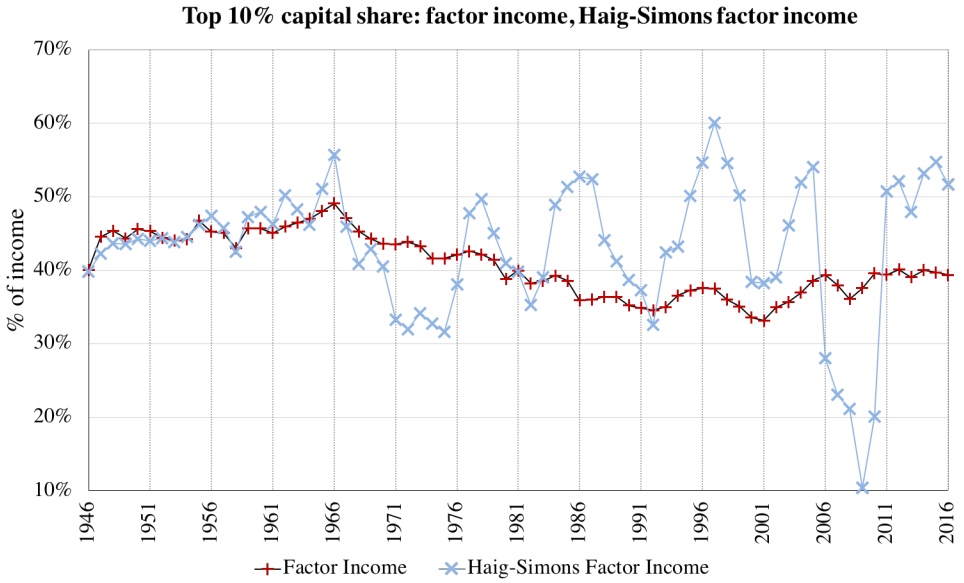

Figure 15: Capital share, top 10%. Factor capital income series is from Piketty, Saez and Zucman (2016), and equals the total factor capital income received by individuals in the top 10% of the income distribution divided by total factor income. Haig-Simons factor capital income series equals the total Haig-Simons capital income received by individuals in the top 10% of the income distribution divided by total Haig-Simons income.

of this source of income on measures of aggregate savings and the distribution of income. We find that measures of savings inclusive of capital gains increased post-1980, compared to the traditional finding that savings has decreased. We also find that including capital gains as income increases the measured capital share of income, and increases the share of income received by the top percentiles of the income distribution.

The analysis of section **??** shows capital gains in the post-1980 were primarily driven by changes in market power and interest rates. This raises the question of whether the large capital gains seen in the data are a temporary force, or will be a sustained source of capital income in the future. Our theoretical model shows that there can be capital gains on a balanced growth path with positive productivity growth. For example, if the ratio of the market value of securities to GDP is 200%, and growth is 2%, there can be capital gains of 4% of GDP in a steady state.

In order to draw welfare and policy conclusions, it is necessary to study in more detail the reasons underlying the increase in capital gains. Capital gains driven by unmeasured intangible investment will contribute positively to output welfare. Capital gains driven by an increase in monopoly power may be either "malignant" or "benign", depending on whether this change is due to benign technological change or lax antitrust enforcement. Changes driven by bargaining power have important distributional consequences, but potentially limited

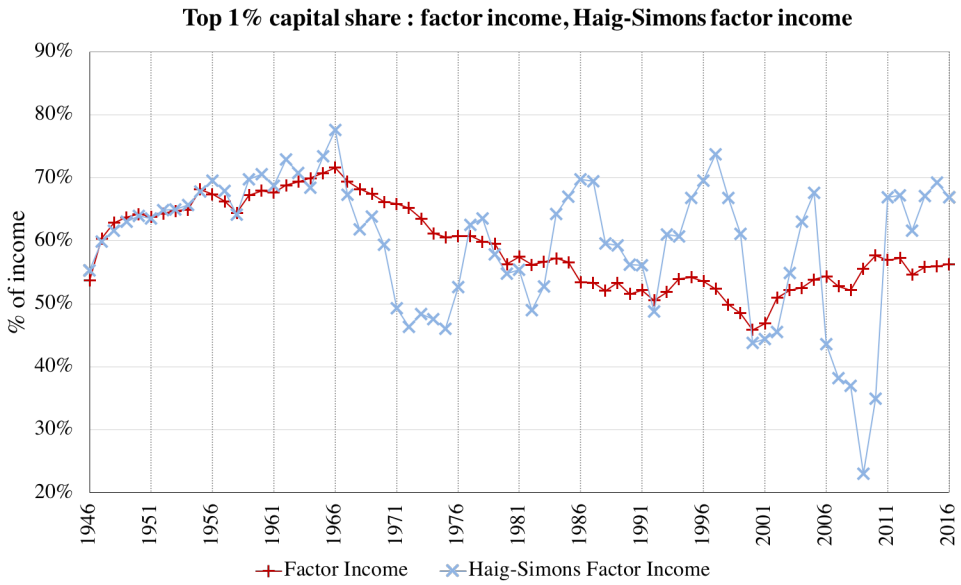

Figure 16: Capital share, top 1%. Factor capital income series is from Piketty, Saez and Zucman (2016), and equals the total factor capital income received by individuals in the top 1% of the income distribution divided by total factor income. Haig-Simons factor capital income series equals the total Haig-Simons capital income received by individuals in the top 1% of the income distribution divided by total Haig-Simons income.

aggregate effects.

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Online Appendix for
Capital gains and Inequality

Jacob A. Robbins