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Stock Market Returns and Consumption

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Abstract

This paper employs Swedish data containing security level information on households' stock holdings to investigate how consumption responds to changes in stock market returns. We exploit households' portfolio weights in previous years as an instrument for actual capital gains and dividends payments. We find that unrealized capital gains lead to a marginal propensity to consume (MPC) of 13 percent for the bottom 50% of the wealth distribution but a flat 5 percent for the rest of the distribution. We also find that households' consumption is significantly more responsive to dividend payouts across all parts of the wealth distribution. Our findings are broadly consistent with near-rational behavior in which households optimize their consumption with respect to capital gains and dividends income as if they were separate sources of income.

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1. Introduction

In the U.S., stockholdings represent the largest share of financial assets on households' balance sheets reaching more than $32 trillion (with about $15 trillion in non-retirement accounts), which makes them comparable in importance to the stock of housing wealth. Given their prominence, movements in stock prices and dividend payments might significantly affect households' consumption and savings decisions. In fact, concerns about the consumption-wealth effects of stock market returns have been the main driver of US monetary policy sensitivity to stock prices movements above any other macroeconomic news (Cieslak and Vissing-Jorgensen, 2017). Furthermore, Survey of Consumer Finance data shows that more than 75 percent of the increase in households' financial wealth since 2010 comes from the increase in value of stock holdings. Thus, an important question one should ask is to what extent the post-crisis stock market rally affected aggregate consumption and consumption inequality. Conversely, how much decline in aggregate consumption should we expect if stock prices sharply decline as they did during past recessions?

Despite the central importance of these questions, there is no comprehensive study on the *causal* impact of changes in stock market wealth on households' consumption. This is due to several challenges: First, aggregate movements in stock prices are endogenous with respect to other macroeconomic shocks, such as expectations of future income growth and consumer confidence.[1] In other words, estimates of the relation between aggregate consumption and stock price movements are likely to be driven by common omitted factors. Second, due to the presence of home bias, exploiting regional cross-sectional variation that would control for macroeconomic fluctuations is also not ideal. One could potentially address these challenges by exploiting household-level data like the consumer expenditure survey. However, the accuracy of the reported measures of capital gains in household-level data like the consumer expenditure survey is highly questionable (Dynan and Maki, 2001).[2] Furthermore, households bias their investment towards their own companies and local firms, resulting in a correlation between capital gains and

[1] See Beaudry and Portier (2006) for evidence on aggregate stock price movements anticipating TFP growth by several years.

[2] There is no direct measure of capital gain in the CEX, and capital gains are imputed based on changes in total security holdings and the amount of sales and purchases during that year. Any such imputation requires strong assumptions on the timing and portfolio rebalancing of households. Moreover, many households reported zero capital gains in the years the stock market performed remarkably well.

other factors affecting their income directly and, therefore, it may even introduce a new source of endogeneity that is absent in the aggregate data.[3] Finally, given the skewness of the stockholdings, it is important to estimate the consumption behavior of the households at the top of the wealth distribution, which are usually underrepresented in these surveys. [4]

The ideal setting would require a dataset that is representative of the whole wealth distribution, which includes both detailed information on households' portfolio holdings, as well as on household consumption and income. With such data, one could compare the consumption response of households that are very similar along other dimensions except for their exposures to different stocks.

In this paper, we approximate this ideal setting by using very granular household-level data from Sweden. Due to the presence of a wealth tax, we are able to have a full picture of the households' balance sheets at the end of each year from 1999 to 2007 (when the tax was repealed). We have data on the universe of households' portfolio holdings at the security level, as well as information about their debt obligations and real estate transactions. To measure consumption, we follow the *residual* approach proposed by Koijen, Van Nieuwerburgh and Vestman (2014) that imputes consumption as a residual of households' disposable income net of other transactions and also validate this measure against survey information.[5]

Even with this data, households' portfolio choices are endogenous and might be driven by omitted factors that are also driving households' consumption behavior. For instance, households that have higher wealth might be less risk averse and invest in portfolios with a higher risk-higher return profile, and at the same time, they might tend to consume more than less wealthy households. We address this issue in several ways. First, we exploit the panel nature of our data and estimate all of our regressions using first differences. This allows us to capture any time-invariant difference across households that might be correlated with the level of their capital gains or dividend income. Second, we limit the heterogeneity across households' portfolios by estimating the MPC separately for different parts of the wealth distribution. Third, we also exclude stockholdings in the households' own industry of activity from their portfolios before

[3] See Mitchell and Utkus (2002), Meulbroek (2002) and Benartzi (2001) for evidence on households' portfolio bias toward their own companies, and Coval and Moskowitz (2001) for evidence on local bias.
[4] See Table A1 in the Appendix for the distribution of stock holdings in the US.
[5] We describe in detail the procedure we use to construct our measure of consumption and its advantages over other approaches in the data section.

computing the capital gains and dividends. This ensures that our results are driven by households' holdings in industries other than their own, whose fluctuations are less likely to be correlated with changes in households' income.

One might still be concerned that changes in capital gains and dividend income might be driven by *dynamic* changes in households' portfolios. In fact, changes in households' portfolios can be driven by factors such as the liquidation of stock holdings due to an expenditure shock or a large durable purchase, the very same factors that are likely responsible for household consumption. Therefore, we instrument the variations in capital gains and dividend income with the capital gains and dividend income that would have accrued, had the household kept its portfolio the same as the one observed in previous years. Intuitively, the portfolio weights in previous years should not be determined by future shocks that drive both stock returns and consumption choices. In theory, the portfolio weights might change significantly from year to year, which would make our computation noisy; however, we find that empirically this is not the case, and in fact, past portfolio weights significantly predict actual capital gains and dividends. In other words, our identification comes from the stickiness in the households' portfolios, for which we find strong evidence in our data.

The first main result is that the MPC out of (unrealized) capital gains for households in the top 50% of the financial wealth distribution is about 5% and, perhaps surprisingly, does not exhibit significant variation between, for instance, households in the 50%-70% bin and households in the top 5% of the wealth distribution. In contrast, the MPC for households in the bottom half of the distribution is significantly higher at about 13%. However, it is worth noting that these households own less than 7% of overall stockholdings.

Moreover, consistent with buffer-stock models of consumption, such as Zeldes (1989), Caroll (1997), Gourinchas and Parker (2002), and their extension to life-cycle portfolio choice model like Cocco, Gomes, and Maenhout (2005), we show that what determines the heterogeneity in MPC out of capital gain is not financial wealth per se, but the ratio of financial wealth and average income. The MPC out of capital gains of buffer-stock households -defined as households with financial wealth less than six months of their disposable income- is more than 20%, but conditional on not being a buffer-stock household, their MPC is invariant with respect to wealth, and is about 5%.

Consistent with the evidence in Baker, Nagel and Wurgler (2007), we find that households are significantly more responsive to changes in dividends. In fact, the MPC out of dividends, for all of our wealth groups, is around 35%, i.e. about seven times the MPC out of capital gains for the top 50th percentile of wealth distribution.

It is worth mentioning that this result is not driven by a potentially endogenous sorting of households with higher levels of consumption (relative to their income) into stocks that pay more dividends. This is because all of our estimates are based on within-household variation of consumption that is caused by changes in the same firms' dividend payments. Though it is hard to reconcile this result with a fully rational model without transaction costs, our result on MPC out of dividends and capital gains is consistent with near-rational behavior in which households separately optimize their consumption with respect to capital gains and dividend incomes as if they were independent from each other.[6] In particular, dividend income changes are significantly more persistent than changes in capital gains, and as long as households consider capital gains and dividend incomes as separate sources of income, this can rationalize an MPC out of dividend income that is significantly larger than MPC out of capital gains.

Finally, we distinguish between the consumption response to realized and unrealized capital gains. Using the observations in the last three years of our sample, for which we observe realized capital gains, we show that households' consumption responds to both; our estimates are robust to directly controlling for realized capital gains. Intuitively, households can freely respond to changes in unrealized capital gains by adjusting their savings decisions, e.g. they can reduce their savings rate when their portfolio yields higher returns; that is why changes in unrealized capital gains might have a significant effect on their consumption decisions.[7]

To provide further evidence on the mechanisms driving the results, we also examine whether, within each wealth group, households in different parts of their life-cycle exhibit heterogeneous responses to changes in capital gains and dividend income. We find that among households with enough financial wealth, MPC out of capital gain is significantly larger for older households. This finding is consistent with life cycle models such as Gourinchas and Parker (2002), where

[6] See Baker et al. (2007) for a comprehensive discussion on the inconsistency of this result with a fully rational model.

[7] Notice that this is also why transaction costs, related to the liquidation of the stock holdings, are unlikely to drive the difference between the MPC for capital gains and dividends.

older and unconstrained households have higher MPC to transitory income (or wealth) shocks, since they consume those capital gains over a shorter period of time and face significantly less uncertainty about their lifetime income and wealth.

In order to mitigate the concern that differences in income, age, and financial characteristics could drive *static* portfolio decisions, we construct narrowly defined bins based on financial wealth deciles, average income deciles within each wealth decile, different age groups, and quantiles of the share of directly held stocks in each wealth decile and allow for observations within each of these bins to have a different time trend and then estimate our regressions of MPC out of capital gains and dividend payments. This approach significantly limits potential sources of heterogeneity across households.

Finally, we also condition on households not only having similar financial characteristics but also sharing the same employer, which ensures that they share a similar income stream. In these specifications, our results are driven by variations in the consumption of households working for the same company, who belong to similar age categories, have similar income, wealth and total exposure to equities, but experienced different capital gains due to differences in their portfolios. We confirm our main results hold even in this more restrictive specification.

Taking stock of our results, both our main findings and their heterogeneity across age and access to liquid wealth, provide evidence consistent with buffer-stock models of consumption. They also suggest that a *representative* rational agent may provide a valid description for the aggregate consumption of stock market participants, since more than 95% of stocks are held by individuals in the top 50% of financial wealth.

1.1 Literature Review

There is an extensive consumption literature that attempts to measure households' MPC. For example, Johnson, Parker and Souleles (2006), Johnson et al. (2013), Agarwal and Qian (2014) and Jappelli and Pistaferri (2014) discuss estimates of MPC out of one-time transfers like tax rebates.[8] Most of this literature finds MPCs for non-durables of about 20% and for total consumption between 60-80%. These papers also find that the MPC for financially unconstrained households is lower. Our estimates of MPC out of dividend income is in line with

[8] See Baker (2017) and Kueng (2017) for estimates of MPC out of more regular income shocks.

these estimates, especially once one takes into account that the majority of stock owners are not financially constrained.

More closely related to our paper, is the literature linking housing wealth and stock wealth with consumption expenditures. Davis and Palumbo (2001), Case, Quigley and Shiller (2005, 2011), Carroll, Otsuka, and Slacalek (2011) and Carroll and Zhou (2012) are examples of studies employing aggregate and regional variation in housing and stock wealth and consumption. On the other hand, Dynan and Maki (2001), Bostic et al. (2009), Guiso, Paiella, and Visco (2006) and Paiella and Pistaferri (2015) are among studies that use household-level variation but lack disaggregated data on households' portfolio holdings. The estimated MPCs out of capital gains in both categories of these papers range from as low as 0% to as high as 10%.[9,10]

While endogeneity concerns and the differences in the methods that are used to overcome those can be responsible for the wide range of estimates based on aggregate data, measurement errors in capital gain and different approaches to mitigate these errors seem to be the main reason for the wide range of estimates in the papers based on survey data.[11] Our paper improves on this previous literature in several ways. First, by using administrative data on the entire population of Sweden, we can be certain that the measurement error on the stockholdings of individuals is minimal, and households in the top quantile of wealth distribution are not underrepresented. Moreover, the data on households' holdings of each individual security helps us distinguish between exogenous changes in the capital gains of households due to market movements and the endogenous variation due to changes in household portfolio.

Our findings are most closely related to Baker, Nagel and Wurgler (2007). They exploit cross-sectional variation in households' consumption, capital gains and dividend income in CEX, in addition to using data from a large discount brokerage on households' net withdrawals, capital gains and dividend income. The authors document that households' consumption and their

[9] See Poterba (2000), Paiella (2009), and Table A2 in the Appendix for a more detailed review of the literature on stock market wealth and consumption.

[10] See Mian and Sufi (2011), Aladangady (2017), Campbell and Cocco (2007), Cloyne et al. (2017) for estimates of MPC out of housing wealth that are based on micro data.

[11] Dynan and Maki (2001) argue that the imputation of household-level capital gains based on the CEX responses might be problematic. For instance, they mention that in the 1995-1998 period –a period of very strong market growth- 30% of households with positive security holdings reported no change in their security holdings. Therefore, instead of using capital gains based on CEX, they imputed the level of stock holding of each individual in the beginning of each year and assumed each household experienced the aggregate market return on their portfolio.

withdrawal behavior is significantly more responsive to dividend income than to capital gains.[12] Our results confirm the main finding of Baker et al. (2007), and suggest that the significant difference between MPC out of capital gains and dividend income is not driven by measurement error in capital gains, endogeneity of households' portfolio choice or lack of data on household balance sheet outside a brokerage account. Moreover, by looking at the entire sample of the Swedish population, we show that households' differential treatment of capital gains and dividend income is present for households in all parts of the wealth distribution including those in the top 5 percent. Furthermore, our results are helpful in discerning between the different underlying theories. In fact, our estimate of a significantly positive MPC out of capital gains allows us to conclude that near-rational behavior, in which households treat capital gains and dividends as separate sources of income, might be a better description of households' behavior than a mental accounting model, where households consume out of dividend but not capital gains, which has been the leading explanation for the differential MPCs out of dividend and capital gains in Baker et al. (2007).

Our paper also fits within the growing set of papers that use administrative data to answer questions about household consumption. Leth-Petersen (2010) uses Danish data (albeit at the aggregate portfolio level) to study the relation between increase in credit supply and household expenditure. Sodini et al. (2016) use Swedish data to measure the effect of home ownership, utilizing Swedish housing market reform in the early 2000s, on household consumption and savings. Fagereng et al. (2016) use Norwegian data to calculate the MPC out of (lottery) income for households in different parts of the wealth and income distribution. More recently, Autor et al. (2017) and Kolsrud et al. (2017) use Norwegian and Swedish data to study the relation between disability insurance, unemployment insurance and household consumption.[13]

This paper is also related to the asset pricing literature that studies the relationship between asset prices and consumption. Julliard and Parker (2005), for instance, study the central insight of the

[12] Baker et al. (2017) proxy for consumption expenditures with net withdrawals from the brokerage accounts. In contrast to a zero MPC for capital gains when they use CEX, they estimate a 2% MPC when they analyze the brokerage account data.

[13] For a detailed discussion of the quality of imputed consumption based on administrative data and its comparison with survey data, see Koijen et al. (2014), Eika et al. (2017), and Kolrsud et al. (2017). These papers show that the quality of the consumption measure based on the residual method depends on the availability of data on detailed household level asset allocation as well as data on housing transactions.

consumption capital asset pricing model—that an asset's expected return is determined by its equilibrium risk to consumption—and find that ultimate consumption risk, defined as the covariance of an asset's return and consumption growth, explains between 44-73% of expected portfolio returns. Vissing-Jorgensen (2002) uses data from the CEX as well as Treasury bill returns and the NYSE stock market index to find that including non-asset holders when estimating the elasticity of intertemporal substitution (EIS) can significantly downward bias estimates. She finds that the EIS lies around 0.3-04 for stockholders, 0.8-1 for bondholders, and is not significantly different from 0 for non-asset holders.

Finally, the literature regarding monetary policy and the wealth-consumption channel is also quite relevant to this paper. Cieslak and Vissing-Jorgensen (2017) find that FOMC decisions on interest rates are significantly affected by movements in the stock market. More importantly, and related to this paper, using textual analysis of Federal Reserve announcements, they find evidence that stock market returns drive policy changes more than other economic factors, precisely because of the concerns of the FOMC members on the potential impact of changes in stock market wealth on households' consumption.[14] On the other hand, Lettau, Ludvigson, and Stiendel (2002) use a variety of models to test whether changes in monetary policy affect consumer spending through changes in asset prices. They find that, at most, the wealth channel plays a small role in transmitting monetary policy to consumption. This limited impact of asset price changes induced by monetary policy on households' consumption can be due to households perceiving those asset price changes as transitory shocks to asset prices.[15]

The rest of the paper is organized as follows. Section 2 describes the data and provides summary statistics. Section 3 lays out our empirical strategy. Section 4 presents the main results, Section 5 explores the potential mechanisms for our findings by investigating heterogeneous responses to capital gains, and Section 6 presents more robustness checks. Section 7 discusses the implications of these findings and concludes.

2. Data

To construct our sample of analysis, we begin with administrative data containing information on

[14] Also see Caballero and Simsek (2018) for a theoretical model that elaborates on amplifications of investors' negative sentiments through this consumption-stock market wealth channel when monetary policy is constrained.
[15] See Lettau and Ludvigson (2004) and Campbell, Pflueger and Viceira (2015) for further discussion of this point.

all Swedish residents, including information on income, municipality of residence, basic demographic information, and detailed wealth data.

For information on households' wealth, we mainly use the Swedish Wealth Register (Förmögenhetsregistret), collected by Statistics Sweden for tax purposes between 1999 and 2007, when the wealth tax was abolished. The data include all financial assets held outside of retirement accounts at the end of a tax year, December 31st, reported by different sources. Financial institutions provided information to the Swedish Tax Agency on their customers' security investments and dividends, interest paid, and deposits. Importantly, this information was reported even for individuals below the wealth tax threshold.[16]

Since this data was collected for tax purposes, we observe an end-of-the-year snapshot of each listed bond, stock or mutual fund held by individuals, reported by their International Securities Identification Number (ISIN).[17] Using each security's ISIN, we collect data on the prices, dividends, and returns for each stock, coupons for each bond, and net asset values per share for each mutual fund in the database from a number of sources, including Datastream, Bloomberg, SIX Financial Information, Swedish House of Finance, and the Swedish Investment Fund Association (FondBolagens Förening).[18] This additional information allows us to compute the total returns on each asset, as well as capital gains and dividends paid to each individual.

From this data, we also observe the aggregate value of bank accounts, mutual funds, stocks, options, bonds, debt, debt payment, and capital endowment insurance as well as total financial

[16] During this time period, the wealth tax was paid on all the assets of the household, including real estate and financial securities, with the exception of private businesses and shares in small public businesses (Calvet, Campbell, and Sodini, 2007). In 2000, the wealth tax was levied at a rate of 1.5 percent on net household wealth exceeding SEK 900,000. This threshold corresponds to $95,400 at the end of 2000. In 2001, the tax threshold was raised to SEK 1,500,000 for married couples and non-married cohabitating couples with common children and 1,000,000 for single taxpayers. In 2002, the threshold rose again to SEK 2,000,000 for married couples and non-married cohabitating couples and 1,500,000 for single taxpayers. In 2005, the threshold for married couples and cohabitating couples rose to SEK 3,000,000 (Black et al. 2016).

[17] Two exceptions to this are the holdings of financial assets within private pension accounts, for which we only observe total yearly contributions, and "capital insurance accounts", for which we observe the account balance but not the asset composition. The reason is that tax rates on those two types of accounts depend merely on the account balances and not on actual capital gains.

[18] For more in-depth description of this component of the data, see Calvet, Campbell, and Sodini (2007, 2009) who use the Swedish Wealth Register for the period 1999 to 2002.

assets and total assets.[19] As a result, we are able to obtain a close-to-complete picture of each household's wealth portfolio.

It should be noted that during the 1999 to 2005 period, banks were not required to report small bank accounts to the Swedish Tax Agency unless the account earned more than 100 SEK in interest during the year. From 2006 onwards, all bank accounts above 10,000 SEK were reported. Since almost everybody has a bank account in Sweden, in reality the people who are measured as having zero financial wealth probably in fact have some bank account balance.[20] We follow Calvet, Campbell, and Sodini (2007), Calvet and Sodini (2014), and Black et al. (2016) and impute bank account balances for households without a bank account using the subsample of individuals for whom we observe their bank account balance even though the earned interest is less than 100 SEK.

Since we are interested in the effect of capital gain on consumption, we limit our sample of analysis to households with a portfolio in the previous period. Furthermore, we restrict attention to households in which the head is younger than 65 years of age.

Additionally, we follow Koijen et al. (2014) and impose the restrictions they impose on the data in order to mitigate potential measurement errors in households' asset changes and consumption. In particular, we limit the sample to households with fixed number of household members between two consecutive periods, those who remain in the same municipality, and those where none of the household members are self-employed or own non-listed stocks, due to valuation problems. Using the real estate transaction register, we drop households who have cash flow from real estate transactions.[21] We also drop households where a household member owns any derivative product (e.g. options), since it is difficult to value those assets correctly, and households for which the calculated financial asset return on the portfolio of stocks and mutual funds is in the bottom 1% or the top 1% of the return distribution in each year.

Finally, to mitigate measurement error, we remove households with extreme changes in financial cash flow between two consecutive periods. This could happen for reasons such as bequests or

[19] We use data from the Income Register to measure disposable income for our sample.
[20] In surveys, the fraction of Swedes aged 15 and above that have a bank account has consistently been 99 percent (Riksbanken, 2014).
[21] As explained in Koijen et al. (2014), this is because any error in the recorded transaction price of houses can introduce a new source of measurement error. Moreover, we find that there is no statistical relationship between capital gains and being involved in a real estate transaction. This is available upon request.

inter-vivos transfers from family members, which we do not observe. We drop households for which the changes in financial cash flow are in the top or bottom 2.5% in the corresponding year-specific distribution.[22]

As mentioned before, when measuring capital gains and dividends, we distinguish between assets that belong to firms that are active in the same industries in which household members work versus firms in other industries and exclude those assets that belong to households' industry of activity from their portfolio. This ensures that our results are driven by households' holdings in industries other than their own, whose fluctuations are less likely to be correlated with changes in household income, and reduces the concern that the relation between capital gains and household consumption is driven by the household's expectation about its future income.

Table 1 presents detailed summary statistics for the main variables of interest. The main takeaway is that there is significant heterogeneity across households in all dimensions. For instance, average consumption ranges from 235,000 SEK in the bottom 50 percent of the financial wealth distribution to 487,000 SEK for the top 5 percent. While the average value of stock wealth is around 20,000 SEK among the stock holders in the bottom 50 percent of the wealth distribution, it is worth around 1,113,000 SEK in the top 5 percent. Also, about 35% of the total financial wealth is stock wealth (including both direct holding of stocks and indirect holding of stocks through mutual funds) for the bottom 50 percent versus 50% for the top decile. Furthermore, there is also some heterogeneity within each financial wealth bin as the standard deviations of our main variables are still noticeable. Our research design aims to explain part of this heterogeneity as a function of the returns on the households' portfolios.

3. Research Design

This section describes our empirical strategy. First, we follow the approach proposed by Koijen, Van Nieuwerburgh, and Vestman (2014) to impute consumption expenses. Specifically, we impute consumption expenditure from the household budget constraint by combining information from the Swedish registry data on income, detailed asset holdings, and asset returns

[22] See Table 13 of Koijen et al. (2013) for the impact of each of these steps on their sample size. These restrictions' effects on our sample size are detailed in Table A3 in the Appendix.

that we collect from third-party sources. For each household *i,* we employ the following identity to compute consumption:

$$c_t = y_t - Debt\ Interest\ Payment_t + \Delta Debt_t - \Delta Bank\ Account_t \\ - Active\ Financial\ Saving_t\ - Active\ Housing\ Saving_t \\ - Pension\ Contribution_t \quad (1)$$

Intuitively, consumption is the difference between the households' after-tax labor and financial asset income (plus transfers plus rental income from renting out owned houses), y_t, and the payment on existing debt, financial and housing savings (which do not include capital gains) as well as pension contributions. We also take into account changes in the indebtedness level. The granularity of the Swedish tax records allows us to measure the right-hand side of equation (1).

This approach has the advantage of allowing us to build a panel of consumption measure for each household. However, there are some limitations. For instance, stock holdings are observed at an annual frequency; this means that we have to ignore stock price changes and active portfolio rebalancing within a year, as well as gifts and transfers.[23,24]

Having estimated consumption expenditures, we are interested in estimating the following specification relating consumption to capital gains and dividends:

$$c_{it} = \alpha_i + \gamma_t + \beta_1 Capital\ Gain_{it} + \beta_2 Dividend\ Income_{it} + \epsilon_{it} \quad (2)$$

where β_1 and β_2 are the main coefficients of interest, α_i is the household fixed effect and γ_t is time fixed effect. More formally we want to estimate:

$$c_{it} = \alpha_i + \gamma_t + \beta_1 (X_{it-1} \cdot r_{st}) + \beta_2 Dividend\ Income_{it} + \epsilon_{it}, \quad (3)$$

where X_{it} is a vector of stockholding weights of individual *i* at time *t*; r_{st} measures the return on portfolio held at time *t-1* between time *t-1* and *t*, and $Dividend\ Income_{it}$ measures dividend income in period *t.*

[23] As shown in Eika et al. (2017), conditional on having information on real estate transactions, taking into account stock transactions within each year does not add much to reducing measurement error.

[24] Here it should be mentioned that although, as in Koijen, et al. (2014), in our main analysis we exclude a few households with negative imputed consumption, our results are qualitatively and quantitatively the same without excluding those data points.

We run all our regressions by normalizing both consumption and the right hand side variables by a three-year (*t-1. t-2, and t-3*) household average disposable income. The main reason is that, in the absence of normalization, the estimated coefficients will be heavily biased towards households with large portfolios who experience significant variation in their capital gain and dividend changes. Moreover, while the level regression requires the assumption that households with different levels of income respond similarly to a dollar of capital gain, normalized regressions require the assumption that households with different levels of income respond similarly to a capital gain or dividend income shock as long as it is the same percentage of their average income. The latter is more consistent with the predictions of rationally optimizing households for which the household maximization problem is scalable in household lifetime income.

By exploiting the panel nature of our dataset and estimating a first difference, we control for time-invariant household characteristics that might affect both the consumption choices and capital gains. More specifically, we estimate:

$$\Delta c_{it} = \beta_1(X_{it-1} \cdot r_{st} - X_{it-2} \cdot r_{st-1}) + \beta_2(Dividend\ Income_{it} - Dividend\ Income_{it-1}) + \beta_3 \Delta Income_{it} + \beta_4 \Delta Wealth_{it-1} + \beta_5 ND_{it,t-1} + \delta_t + \epsilon_{it} \quad (4)$$

where we also control for change in disposable income (minus dividend payment) between time *t-1* and *t*, change in lagged financial wealth, time fixed effect, and a dummy for whether the household has received any dividend payments in either of the two periods.

However, even after excluding stockholding of households in their own industry (as explained before), both the change in capital gain and the change in dividend income in equation (4) contain not only an exogenous component that arises from the movements in market returns to each stock (r_{st}) or changes in the dividend payments per share (D_{st})[25] but also an endogenous component that comes from changes in household portfolio allocation X_{it}. In particular, the change in capital gains (or equivalently for dividends) can be rewritten as $X_{it-2}.(r_{st} - r_{st-1}) + (X_{it-1} - X_{it-2}).r_{st}$. While the variation in the first term is driven by the variations in the stock market returns, the variations in the second term are completely driven by the changes in the portfolio endogenously made by the household.

[25] We use Datastream to get data on dividend payments per share.

For instance, consider a household who receives a positive income shock and increases its consumption as a result. However, at the same time, the positive income shock can result in the expansion of the portfolio and therefore a positive change in capital gains - since $(X_{it-1} - X_{it-2})$ will be positive. Alternatively, we can think of a household who received an expenditure shock in period *t-1* and liquidated part of its portfolio to finance that expenditure shock. Since this was a one-time expenditure shock, everything else being fixed, Δc_{it} will be negative. However, because this household liquidated part of its portfolio in *t-1,* $(X_{it-1} - X_{it-2})$ will be negative, and therefore, the change in capital gains will be negative. These are just two examples of reasons why one could observe a positive correlation (assuming market return in that year was positive) between changes in consumption and capital gains without that correlation being driven by the causal impact of capital gains on household consumption.

Our main proposed solution to deal with the aforementioned endogeneity issue is to employ passive returns ($X_{it-2}.(r_{st} - r_{st-1})$) and passive dividends ($X_{it-2}.(D_{st} - D_{st-1})$) to instrument for total portfolio returns ($[(X_{it-1} \cdot r_{st}) - (X_{it-2} \cdot r_{st-1})]$) and total dividends ($[(X_{it-1} \cdot D_{st}) - (X_{it-2} \cdot D_{st-1})]$) in the first-difference regression. By doing that, we capture the effect of changes in actual returns from what would have been household *i*'s capital gain and dividend, assuming no changes in its portfolio.[26] Intuitively, in this setting, any variation in portfolio allocations cannot drive our results, limiting the endogeneity concerns. In theory, the weights can significantly change from year to year, but we show that households' portfolio choice is relatively stable and our instruments strongly predict the actual capital gains and dividends.

Our baseline specification is an IV estimation of equation (4) for different wealth groups. Specifically, we separately identify a coefficient for households between the 5th and the 50th percentile, 50th and 70th, 70th and 90th, 90th and 95th, and 95th to 100th percentiles of the financial wealth distribution. Coefficients β_1 and β_2 capture the marginal propensity to consume for every dollar of capital gains and dividends, normalized by the household's average income.

It is worth mentioning that, the only case in which the change in portfolio value mechanically affects our imputed measure of consumption is when there is an active change in the portfolio. In

[26] Calvet, Campbell and Sodini (2009) uses a similar strategy to calculate the share of risky assets in household portfolio in the absence of any rebalancing.

other words, if a household does not change its portfolio, there is no part of the imputed measure of consumption that is impacted mechanically by the changes in portfolio value. Since our IV approach excludes any variation in capital gain that originates from the change in the portfolio, any measurement error for consumption that comes from active portfolio rebalancing is uncorrelated to our measure of passive capital gains.

4. Main Results

This section presents the main results. We start our analysis by reporting the OLS results for specification (4), where the returns are driven by employing the actual portfolio weights. The results here are due to the changes in capital gains and dividend income that are generated from both the passive return due to market movements and also endogenous rebalancing of the portfolios by households between the two periods. Comparing these results with the IV estimates sheds light on the importance of the endogeneity concern.

Table 2 presents the results. We find that households in the bottom 50% of the wealth distribution consume about 33 cents for every dollar of capital gains. This MPC monotonically declines with the households' wealth to about 5 cents for the top 5% of the distribution. We also find a similar, but larger, reaction of consumption to dividend payments. Households in the bottom 50^{th} percentile of the wealth distribution consume about 50 cents for every dollar of change in dividend income, and this reduces monotonically to about 9 cents per dollar for households in the top decile of wealth distribution. Although these estimates correct for the endogeneity concern arising from households' portfolio exposure to their own industry, they do not address the concern about the endogeneity in capital gain or dividend income changes due to the changes in households' portfolio. Therefore, we now turn to our main empirical strategy.

We next focus on the IV estimates of specification (4), where households' capital gain and their dividend income are instrumented by their passive capital gain and passive dividend income. First stage results for this exercise have been presented in Panel A of appendix tables A4.1 and A4.2. Table A4.1 shows that passive capital gain strongly predicts the actual capital gain, which is consistent with the evidence on the persistence of households' portfolio allocations. Interestingly, the explanatory power of passive capital gains for total capital gains increases with household wealth; this can be seen from an increase in the R-squared values of the regressions in

the first stage. While for the bottom 50th percentile of the wealth distribution changes in passive capital gains explain 47% of variation in total capital gains, the same number is 75% for the top 5% of the wealth distribution. This also suggests that the endogeneity concern is a more important problem for households in the lower part of the wealth distribution. Table A4.2 shows similar facts for dividend payments and confirms that passive dividend income is a strong predictor of total dividend income. It is worth noting that our data on dividend income (from Datastream) has lower coverage than our data on stock returns (coming from 6 different sources including Datastream), and therefore, our estimated coefficients for the impact of passive dividend income on actual dividend income are smaller than the analogous coefficient for the capital gain regression. This fact is also reflected in the lower R-squared values of the regressions reported in Table A4.2.

Moreover, disposable income and lagged financial wealth are only very weakly related to capital gains and dividend income and the first stage regression coefficients remain the same in the absence of these control variables. We also report the first stage estimates for capital gains and dividend income without including the controls in Panel B of appendix tables A4.1 and A4.2. These results confirm that our instruments are not correlated with observable controls and also that adding controls does not change the explanatory power of our instruments for the actual capital gains and dividend income.

As with Table 2, each column in Table 3 presents the average MPC out of capital gains and dividends for a specific wealth group. All specifications include disposable income (net of dividend payments) and a lagged measure of financial wealth as controls, as well as, year fixed effects and a dummy for whether the household has received any dividend payments in the two periods. Moreover, our specification in first differences captures time-invariant household characteristics that might be correlated with the consumption decision.

We find that the highest MPC is for the bottom 50th percentile of the wealth distribution and is about 14 cents for every dollar increase in capital gains. From there, it decreases significantly to about 5 to 6 cents for households in the top 50th percentile of the wealth distribution. The second

row of Table 3 shows that the MPC out of changes in dividends is significantly larger than the estimated MPCs for capital gains and is about 30-40 cents for all wealth groups.[27, 28]

These results are consistent with models of buffer-stock households, such as those proposed by Zeldes (1989), Caroll (1997), Gourinchas and Parker (2002) and, more recently, Kaplan and Violante (2014) that predict households with low liquid wealth exhibit higher MPC from temporary income or wealth shocks.

What can explain the difference in the MPC out of capital gains and MPC out of dividends? Baker et al. (2007) discuss in detail why this is inconsistent with fully rational behavior but is in line with mental accounting by households.[29] At the root of the inconsistency with a fully rational model is the fact that, to the extent that stock prices reflect the value of all future dividends, any change in dividend payouts should not have any additional impact on household consumption. While it is difficult to reconcile our result with a fully rational model, our result on MPC out of dividends and capital gains can be consistent with a near rational behavior in which households optimize their consumption with respect to capital gains and dividend incomes as if they were independent from each other. In particular, in our data, dividend income changes are significantly more persistent than changes in capital gains (as shown in Figure 1) and as long as households consider capital gains and dividend incomes as separate sources of income, this can rationalize an MPC out of dividend income that is significantly larger than MPC out of capital gains.[30]

4.1 Capital Gains, Dividend Incomes, and Components of Household Saving

A concern about the effect of dividend income on consumption presented in Table 3 is that dividend income is part of the household income that goes directly into the imputation of our

[27] In Table A5, we report the result of the same regression without any controls. This is to ensure that our results are not contaminated by the fact that we do not use exogenous variations in the income of the households.
[28] Table A6 reports the results when we do not exclude observations with negative imputed consumption. As one can see, this does not change any of our results.
[29] See Sherfin and Thaler (1988).
[30] For example, think about the extreme case in which any change in dividend payments is permanent. Then the "optimal" response of households in this near-rational framework is to increase their consumption by one dollar for each dollar of increase in their dividend income. Alternatively, let us assume that the price of a security follows a random walk. Therefore, a one-dollar increase in a stock price today does not have any predictive power about future movements in the stock price. In that case, the optimal response of household consumption to this one time wealth shock is the same as the consumption response of the household to a one-time temporary income shock – since households can always transfer a dollar of transitory income shock to a dollar of wealth and vice versa- and is equal to the annuity income of one dollar –which is significantly less than one.

consumption measure. Therefore, our MPC out of dividend income may be biased towards one. In order to address this concern, we report the results when we regress cash flow (financial saving) of households and its components on households' capital gain and their dividend income. Since dividend income does not affect any component of household financial saving in a mechanical way, this will provide an upper bound on the MPC out of dividend income. Moreover, analyzing the components of household cash-flow provides us with a better understanding of how household consumption and savings behavior respond to capital gains.

The results are shown in Table 4.[31] Panel A reports the impact of capital gains on household active financial saving and its components. Note that each cell is related to a separate regression. For example, the first row reports the impact of capital gains on total cash flow of households when estimated separately for each wealth group. These coefficients, by construction, are equal to the MPC estimates of capital gains times minus one. The first row in Panel B reports the impact of dividend income on households' active financial saving. Again, these coefficients by construction are equal to one minus the estimated MPC out of dividend income (reported in Table 3). The estimated coefficients for dividend income show that on average, households save 60-70% of their dividend income and therefore their MPC out of dividend payments cannot be more than 30-40%.

We also investigate the response of different components of households' balance sheets to capital gains and dividend incomes. Row (a) in Panel A of Table 4 shows that households in the top 50th percentile of the wealth distribution reduce their savings in stocks by about 10 cents with respect to a dollar increase in their portfolio value (i.e. 90 cents net increase in the value of their portfolio in response to a dollar of capital gain). This comes both from selling some of their existing stocks and, more importantly, by adjusting their savings and purchase of new stocks which will not incur any transaction cost. Rows (b) and (c) of Panel A show that households use part of this additional cash flow (either from liquidating stocks or reducing their savings in stocks) to pay down their debt and increase their holdings in their bank accounts. Row (a) of Panel B shows that indeed households in the top 50th percentile of wealth distribution reinvest about half of the income from dividends in stocks. Rows (b) and (c) show that they also keep 6 to

[31] Note that our imputed consumption is equal to household disposable income minus household active financial saving.

10 cents of the dividend income in their bank account and use another 10 cents to pay down their debt.

4.2 Realized vs. Unrealized Capital Gains

So far, we have focused on the effects of capital gains on households' consumption, regardless of whether the gain is realized or not. This is partly driven by data limitations; since we are unable to observe stock transactions, for most of the sample we cannot cleanly identify the price at which households bought the stocks, which makes it impossible to compute realized capital gains.

However, for the 2005-2007 period, households' realized capital gains for different asset categories were reported in the Capital Income Registry. We exploit this additional piece of information to try to disentangle the effects of realized and unrealized capital gains on households' consumption. Since we have this additional information only for three years, we first estimate our baseline IV regression of equation (4) for that subsample and report the result in Table A8. The table shows that the coefficients on both capital gains and dividends are very similar to the ones found for the entire sample (Table 3).

We can then augment specification (4) by including the realized gains as an additional control. The hypothesis is that if the realized capital gains are the main driver of the changes in households' consumption we should observe the coefficient on our measure of capital gain decrease. However, Table 5 shows that this is not the case. In fact, we find that although, expectedly, an increase in the realized capital gains is positively correlated with an increase in consumption, the coefficient on our measure of total capital gain (including both the realized and unrealized capital gain) is almost unaffected.

Here it should be noted that while our estimated coefficient for the total capital gain relies on the passive variations in capital gain that are not affected by household choices, realized capital gain is affected by the endogenous decision of households to rebalance their portfolio (e.g. a household receives an expenditure shock and liquidates part of its stock holding in order to smooth that shock), and therefore, the estimated coefficient can be biased upward.

The fact that households' consumption is responsive to unrealized capital gains suggests that in response to a positive capital gain, households do not necessarily need to liquidate their stocks in

order to increase their consumption. Rather, they can reduce (increase) their savings rate, which in turn affects their expenditures. Adjustment through the change in the saving rate is also tax advantageous, because it will allow households to avoid paying capital gain tax. In sum, it seems that adjustment in saving rate is an important channel through which households' consumption respond to their capital gain portfolio.

5. Heterogeneity

To provide further evidence on the mechanisms behind the results, we examine whether households with different access to liquid wealth and those in different parts of their life-cycle exhibit heterogeneous consumption responses to changes in their portfolio returns.

To investigate the effect of access to liquid wealth, we define "buffer-stock" households as those whose level of liquid wealth (cash, stocks, funds, bonds, and endowment insurance) is less than 6 months of disposable income and ask whether the response to capital gain differs with being liquidity- constrained.[32] For each wealth group, we interact capital gain and dividend income with a dummy indicating whether a household is a "buffer-stock" household and employ the corresponding instrumental variables. Note that hardly any households in the top 10 percent of the distribution qualify as "buffer-stock", and as a result, we do not have any reliable interaction estimates for households in those two groups.

Table 6 reports the results. We find that the interaction coefficients for capital gain are statistically and economically significant. The results indicate that when households have access to "high enough" liquidity, response to capital gain shocks is quite uniform across different wealth groups. The result on the interaction term with capital gain also shows that the buffer-stock households have significantly higher MPC out of capital gain and they consume about 15 cents more out of each dollar of capital gain. While this result is consistent with the prediction of life-cycle consumption models with financial frictions like Carrol (1997) and Gourinchas and Parker (2002), it can also be consistent with a model in which both lower financial wealth and higher MPCs are caused by the households being less patient.

[32] 6 months of income used here is somewhat arbitrary, but the results are also consistent with using 3 or 9 months of income as the threshold.

The interaction terms with dividends are positive but not statistically significant. This can be partly rationalized by the fact that, even in models with financial frictions and precautionary saving motivation, households' consumption response to permanent changes is not a function of how financially constrained the household is and is close to one. To the extent that changes in dividend payments are perceived by households as a relatively stable change, we should expect less heterogeneity in MPC out of dividend income between buffer-stock households and other households. The second reason for the insignificant coefficient is that shocks to dividend income (especially for households in the bottom 90^{th} percentile of wealth distribution) account for less than 1% of households' annual income. This can make the standard errors in our estimates of the MPC out of dividend income larger, which makes it even more difficult to find a significant difference between MPC out of dividends for buffer-stock households compared to other households.

We also examine whether households in different parts of their life-cycle exhibit heterogeneous consumption responses to changes in their portfolio returns. To do so, we report the estimates separately for three age groups: less than 40, between 40 and 55, and between 55 and 65 in Table 7. What seems to be clear here, especially in the case of heterogeneous response to portfolio return, is that households consume more out of capital gain as they get older. This is consistent with the predictions of life cycle models with less than complete bequest motive, in which older unconstrained households have higher MPC out of transitory income or wealth shocks, since they consume those gains over a shorter period of time and face significantly less uncertainty about their lifetime income and wealth.

6. Robustness Analysis

So far, we have abstracted from the potential role of other types of wealth in our regressions. One could imagine that passive capital gain could be correlated with changes in housing wealth or financial wealth net of portfolio. To investigate this, we add these controls and instrument changes in housing wealth with the average changes at the municipality level. The results are presented in Table 8. The coefficient estimates for capital gain and dividend income are not significantly affected. This suggests that our coefficients of interest are not driven by changes in the value of other types of wealth.

Additionally, although in our analysis all the variation in capital gains comes from passive movements in individual stock prices, one may be concerned about the potential determinants of the static portfolio choice of households, such as the riskiness of household income or the co-movement of household income with the aggregate economy, and how those affect household consumption. In order to alleviate these concerns, we go further by directly matching households based on several characteristics, such as their financial wealth, age, income, portfolio's dividend yield, portfolio's value, and share of directly-held holdings (i.e. not held through mutual funds).

Specifically, we define bins based on: ten wealth deciles, nine age groups between 18 and 65, ten income deciles within each wealth group, and five groups based on the share of directly held stocks within each wealth group. This results in 4500 finely defined groups. We then re-estimate our baseline regression in Table 3 but let observations in each of these 4500 bins to have a different time trend. In other words, we only exploit the variation in capital gains and consumption within these very narrowly defined groups in order to estimate the MPC out of capital gain and dividend income. The results are presented in Table 9 and overall confirm our previous findings.

Finally, in our most restrictive specification, we use the variation for households who share the same employer (for the head of the household) and also have similar wealth, income, age and share of stocks in portfolio. The same employer requirement ensures that our results are not driven by any differential exposure of households' income to the business cycle. In particular, we define new bins based on each employer (firm) in our data, five wealth groups, four income quartiles within each wealth group, three age groups (less than 35, 35-50, and older than 50) and two groups based on the share of stocks within each wealth group. Then we allow for workers within each bin to have a different time trend. The result of this restrictive specification is reported in Table 10 and confirm our baseline estimates.[33]

[33] Note that the number of observations within each wealth category that we use to present results is reduced to less than half of the number of observations in Table 3. This is because for this specification we require at least two workers with the same employer and the same bin based on wealth, income, age and stocks share. Also, the reason that we have fewer wealth/income/age/share of directly held stock groups than the previous exercise is to have enough number of final bins containing at least two households.

7. Conclusion

This paper takes advantage of a unique administrative dataset containing household-level information on stock holdings and imputed consumption for the entire Swedish population to analyze households' consumption decisions in response to changes in capital gains and dividends.

Two main advantages of our approach set this paper apart from the existing literature. First, we are able to address the endogeneity issues arising from the fact that a change in portfolio value could be the result of passive changes in asset prices as well as active (endogenous) rebalancing of portfolio and that factors, such as income shocks or bonus payments, might increase both household consumption and household stockholdings by fixing the portfolio weights of the households when computing the capital gains and the dividends to the ones observed in previous years. Second, the scope of our data allows us to investigate the heterogeneity in households' response depending on the level of household wealth.

We uncover three main findings. First, we show that the MPC out of capital gains for the households in the top 50% of financial wealth distribution is relatively uniform and around 5%. On the other hand, it is significantly higher and more than 10% for the bottom 50% of the distribution. Importantly, we show that in the absence of limited access to liquid wealth, there is no more heterogeneity in MPC out of stock wealth among households in different parts of the wealth distribution. This is consistent with models of buffer-stock consumption in which households with high enough liquid wealth behave according to the predictions of permanent income hypothesis.

We also find that the MPC out of dividends, for all of our wealth groups, is much larger than the MPC out of capital gain. Higher MPC out of dividend payments is consistent with a near-rational behavior in which households optimize their consumption with respect to capital gains and dividends income as if they were separate sources of income.

Finally, we distinguish between the consumption response to realized and unrealized capital gains and show that household consumption is responsive to unrealized capital gains as well as realized capital gains and controlling for realized capital gains hardly changes our estimates of MPC out of capital gain.

To provide further evidence on the mechanisms driving the results, and in addition to investigating the role of having access to *enough* liquid wealth compared to monthly disposable income, we also examine whether within each wealth group, households in different parts of their life-cycle exhibit heterogeneous responses to changes in capital gains and dividend income. We find that among households with enough financial wealth, MPC out of capital gain is significantly larger for older households. This finding is consistent with life cycle models such as Gourinchas and Parker (2002) and Cocco, Gomes and Maenhout (2005) where older unconstrained households have higher MPC to transitory income (or wealth) shocks, since they consume those gains over a shorter period of time and they face significantly less uncertainty about their lifetime income and wealth.

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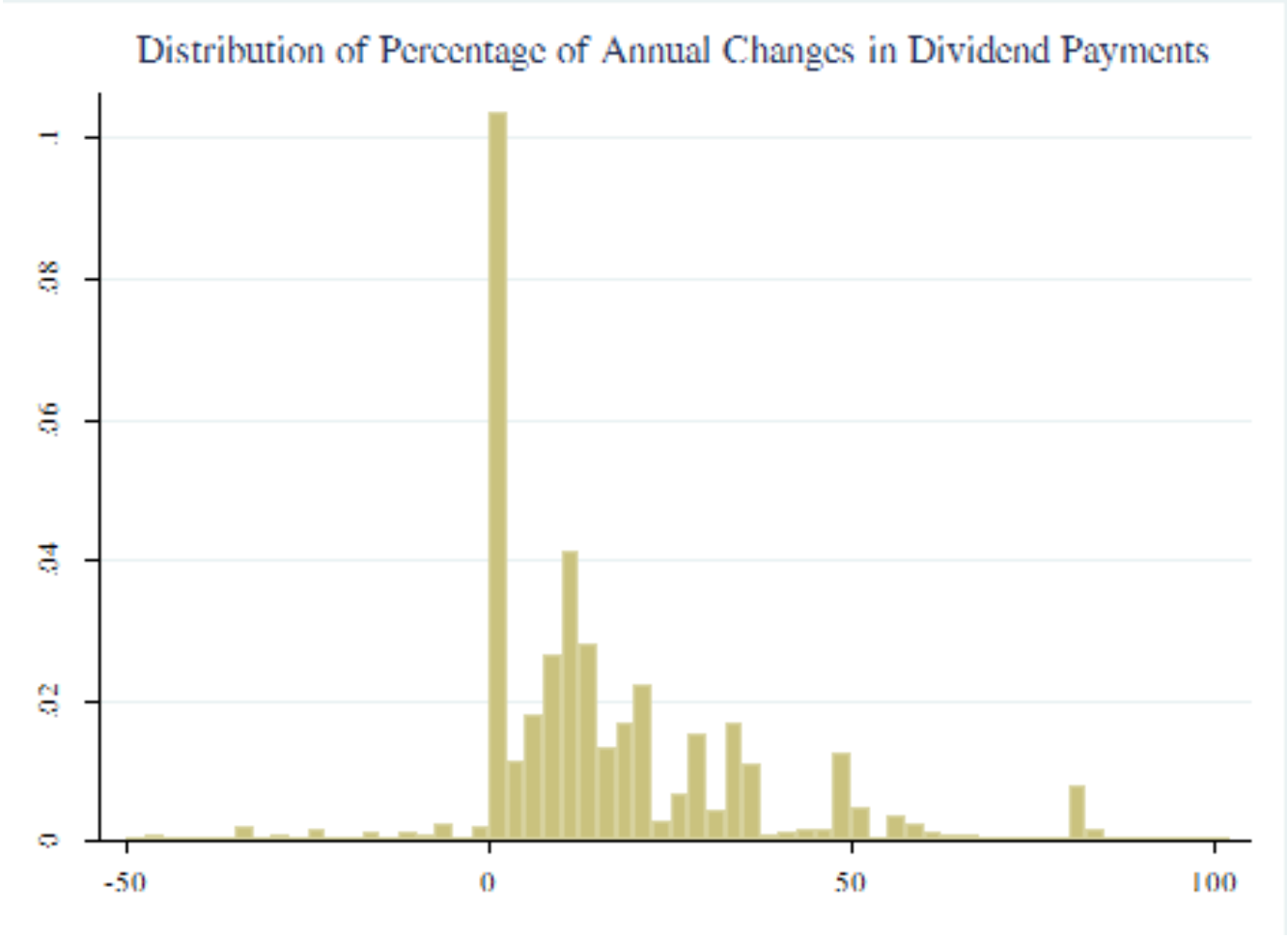

Figure 1 Distribution of Percentage of Annual Changes in Dividend Payouts

Table 1: Summary Statistics

	p1	p10	p25	p50	p75	p90	p99	mean	sd
Panel A: Entire Sample (6.33 m observations)									
Financial Wealth	0.727	16.31	46.45	127.5	322.7	702.5	2169	281.2	459.2
Stock Wealth	0.000	2.639	13.38	51.42	157.7	385.4	1407	150.0	292.9
Income	46.55	119.6	168.7	256.5	379.5	482.5	742.4	285.7	319.9
Consumption	36.65	115.1	164.8	261.2	400.0	550.7	995.1	306.9	254.3
Capital Gain	-158.6	-17.52	-1.019	1.025	9.429	35.58	200.5	5.827	57.43
Normalized Capital Gain	-0.619	-0.073	-0.004	0.0044	0.037	0.130	0.654	0.0165	0.186
Dividend	0.000	0.001	0.079	0.461	1.660	4.612	20.81	1.845	4.553
Normalized Dividend Income	0.000	2.89E-6	3.44E-4	0.0018	0.006	0.017	0.0682	6.47E-3	0.014
Panel B: 0 - 50th percentile of financial wealth (2.28 m observations)									
Financial Wealth	0.057	5.910	15.67	35.15	64.06	103.0	241.3	48.41	51.59
Stock Wealth	0	0.547	3.077	11.26	27.01	49.23	124.9	20.13	28.49
Income	38.71	96.76	140.7	188.9	285.5	375.3	520.5	216.3	109.9
Consumption	35.15	104.6	141.3	195.3	299.5	414.0	714.1	234.9	140.4
Capital Gain	-15.37	-2.691	-0.179	0.231	1.782	5.290	19.61	0.869	6.479
Normalized Capital Gain	-0.106	-0.014	-0.001	0.001	0.009	0.030	0.146	0.005	0.045
Dividend	0	0.000	0.010	0.085	0.271	0.543	1.421	0.207	0.446
Normalized Dividend Income	0	0.000	4.90E-5	4.22E-4	0.001	0.003	0.012	0.00125	0.003
Panel C: 50th - 70th percentile of financial wealth (1.86 m observations)									
Financial Wealth	11.74	53.55	85.33	129.70	190.2	263.2	471.3	148.7	96.38
Stock Wealth	0.145	9.403	27.48	58.30	100.9	152.8	294.1	73.24	65.53
Income	47.83	128.0	182.6	288.9	393.7	477.9	662.8	296.7	141.1
Consumption	40.71	122.2	179.6	287.7	412.6	540.7	900.8	315.6	181.5
Capital Gain	-45.41	-12.88	-1.462	2.152	9.208	20.35	57.71	3.469	17.83
Normalized Capital Gain	-0.282	-0.055	-0.005	0.008	0.034	0.086	0.342	0.014	0.102
Dividend	0	0.013	0.185	0.566	1.134	1.853	4.030	0.820	1.228
Normalized Dividend Income	0	4.35E-5	0.00062	0.00198	0.005	0.009	0.029	0.00379	0.006
Panel D: 70th - 90th percentile of financial wealth (1.66 m observations)									
Financial Wealth	54.57	171.0	250.9	369.1	536.5	728.4	1126	416.4	234.3
Stock Wealth	0.959	34.32	91.71	181.1	304.5	458.1	825.1	221.9	181.6
Income	70.26	148.8	208.0	321.5	432.7	544.6	810.9	336.5	179.4
Consumption	37.25	131.0	201.9	322.7	465.7	624.7	1073	358.6	305.6
Capital Gain	-88.99	-30.57	-5.182	5.292	21.80	44.91	109.7	7.196	35.52
Normalized Capital Gain	-0.659	-0.164	-0.027	0.021	0.093	0.215	0.695	0.027	0.215
Dividend	0	0.146	0.722	1.885	3.646	5.999	12.84	2.672	3.191
Normalized Dividend Income	0	0.00048	0.00222	0.00589	0.012	0.023	0.064	0.00988	0.013
Panel E: 90th - 95th percentile of financial wealth (323 k observations)									
Financial Wealth	250.5	553.9	735.3	960.6	1213	1459	1986	990.2	369.7
Stock Wealth	5.643	111.2	273.0	494.1	752.5	1024	1562	541.9	358.2
Income	93.54	170.3	236.6	346.6	467.1	598.3	929.9	371.2	183.3
Consumption	31.38	135.7	223.7	356.8	523.6	721.1	1252	403.1	256.7
Capital Gain	-287.0	-119.8	-34.23	15.70	78.84	156.5	335.9	19.99	117.1
Normalized Capital Gain	-1.135	-0.411	-0.103	0.046	0.222	0.459	1.158	0.044	0.395
Dividend	0	0.679	2.438	5.689	9.884	14.67	27.31	7.002	6.372
Normalized Dividend Income	0	0.00202	0.00689	0.0161	0.030	0.049	0.109	0.0222	0.023

Panel F: 95th - 100th percentile of financial wealth (201 k observations)									
Financial Wealth	535.2	1017	1342	1768	2349	3150	5822	1989	1129
Stock Wealth	12.10	236.6	540.9	953.6	1484	2127	3989	1113	844.4
Income	111.8	200.3	285.0	400.4	535.5	688.5	1220	439.3	1585
Consumption	27.37	145.5	256.1	417.5	629.2	895.9	1640	487.4	719.3
Capital Gain	-587.6	-243.0	-80.43	24.18	148.7	302.1	689.8	32.86	237.5
Normalized Capital Gain	-1.570	-0.713	-0.217	0.063	0.364	0.724	1.503	0.048	0.592
Dividend	0	1.720	5.457	11.90	20.88	32.84	70.12	15.49	14.87
Normalized Dividend Income	0	0.0046	0.0135	0.0302	0.054	0.085	0.158	0.039	0.034

Note: This table reports summary statistics of financial characteristics as well as imputed consumption of households in different wealth groups. Each observation refers to a household-year. The sample includes observations for years 2001-2007 and is restricted to households (1) who participate in the stock market in two consecutive periods, (2) in which the head is younger than 65 years of age, (3) with fixed number of members in two consecutive periods, (4) who remain in the same municipality, (5) where none of the members are self-employed, owns non-listed stocks, or any derivative products, and (6) who have neither moved nor received any cash flow from the sale of a real estate. We also drop households for which we observe non-identified dividend payments. Finally, we drop households for which the calculated financial asset return on their portfolio of stocks and mutual funds is in the bottom 1% or the top 1% of the return distribution in each year, the change in financial cash flow for them are in the top or bottom 2.5% the corresponding year-specific distribution, dividend over 3-year average income is in the top 0.5 percent of the distribution, capital gain over 3-year average income is in the top or bottom 0.5 percent of the distribution, or consumption over 3-year average income is in the top or bottom 0.5 percent of the distribution. Financial wealth includes bank accounts, bond holdings as well as stock holdings. Stock wealth includes both direct holding of stocks as well as holding of mutual funds. Income includes both labor income and financial income minus dividend income plus transfers. Portfolio gain is the passive return on the portfolio of the household as of the year before. Dividend income is based on the dividend of identified assets. Consumption is imputed according to Eq (1).

Table 2: Stock Returns and Consumption: Endogenous Regressions

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.335	0.146	0.103	0.065	0.053
	(0.013)***	(0.006)***	(0.004)***	(0.006)***	(0.006)***
Dividend	0.513	0.348	0.156	0.088	0.091
	(0.092)***	(0.058)***	(0.046)***	(0.052)*	(0.041)**
Disposable income	0.716	0.590	0.590	0.570	0.580
	(0.002)***	(0.004)***	(0.005)***	(0.010)***	(0.010)***
Lag wealth	0.026	0.036	0.035	0.025	0.004
	(0.000)***	(0.000)***	(0.001)***	(0.001)***	(0.002)**
Observations	2,495,037	1,647,177	1,620,781	361,389	226,328
R-squared	0.132	0.068	0.048	0.040	0.037

Notes: The table reports the OLS regression of change in households' consumption as a function of change in their capital gain and dividend income:

$$\Delta c_{it} = \beta_1 \, \Delta Capital\ Gain_{it} + \beta_2 \, \Delta Dividend\ Income_{it} + \beta_3 \Delta Income_{it} + \beta_4 \Delta Wealth_{it-1} + \beta_5 ND_{it,t-1} + \delta_t + \epsilon_{it}$$

Both consumption and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. The table reports five separate regressions for each wealth group and controls include income (net of dividend payment), one year lagged financial wealth of the household as well as, $ND_{it,t-1}$, a dummy equal to one if the household did not receive any dividend in both periods t and $t-1$. Standard errors are clustered at the household level. See notes of Table 1 for description of variables and the restrictions on the sample.

Table 3: Stock Returns and Consumption: IV Regressions

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.137	0.059	0.055	0.059	0.056
	(0.015)***	(0.006)***	(0.005)***	(0.008)***	(0.008)***
Dividend	0.368	0.444	0.340	0.381	0.280
	(0.081)***	(0.058)***	(0.047)***	(0.051)***	(0.043)***
Disposable income	0.715	0.588	0.588	0.570	0.579
	(0.002)***	(0.004)***	(0.005)***	(0.010)***	(0.010)***
Lag Wealth	0.025	0.035	0.034	0.024	0.004
	(0.000)***	(0.000)***	(0.001)***	(0.001)***	(0.002)**
Observations	2,495,037	1,647,177	1,620,781	361,389	226,328
R-squared	0.127	0.063	0.045	0.039	0.036

Notes: The table reports the IV regression of change in households' consumption as a function of change in capital gain and dividend income when change in capital gain and dividend income is instrumented by their passive capital gain and passive dividend income: $X_{it-2}.\left(r_{st}^{inst} - r_{st-1}^{inst}\right)$ and $X_{it-2}.\left(div_{st}^{inst} - div_{st-1}^{inst}\right)$ where X_{it} is the vector of stockholdings weights of individual *i* at time *t*; while r_{st}^{inst} and div_{st}^{inst} are vectors of stock returns and dividends, as defined in section 3 of the paper. Both consumption and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. Standard errors are clustered at the household level. See notes of Table 1 for description of variables and the restrictions on the sample.

Table 4: Stock Returns and Active Financial Saving: IV Regressions

Dependent Variable: Active Financial Saving					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Panel A: Capital Gain and Components of Household Cash Flow					
1.Portfolio Return	-0.137	-0.059	-0.055	-0.059	-0.056
	(0.015)***	(0.006)***	(0.005)***	(0.008)***	(0.008)***
(a) Portfolio	-0.196	-0.102	-0.109	-0.091	-0.095
	(0.012)***	(0.006)***	(0.005)***	(0.009)***	(0.010)***
(b) Bank Accounts	0.014	0.012	0.028	0.035	0.051
	(0.008)*	(0.005)**	(0.004)***	(0.008)***	(0.010)***
(c) Debt	0.041	0.031	0.035	0.010	0.022
	(0.009)***	(0.004)***	(0.003)***	(0.004)**	(0.005)***
(d) Private Pension	0.000	0.000	0.004	0.003	0.002
	(0.001)	(0.000)	(0.000)***	(0.000)***	(0.000)***
(e) Bonds	0.001	0.001	0.008	0.012	0.008
	(0.003)	(0.002)	(0.002)***	(0.004)***	(0.005)
(f) Capital Insurance	-0.001	-0.002	-0.023	-0.028	-0.045
	(0.002)	(0.002)	(0.002)***	(0.004)***	(0.005)***
(g) Debt Service	0.005	0.002	0.002	-0.000	0.000
	(0.000)***	(0.000)***	(0.000)***	(0.000)	(0.000)
Panel B: Dividend Income and Components of Household Cash Flow					
1.Dividend	0.632	0.556	0.660	0.619	0.720
	(0.083)***	(0.059)	(0.048)***	(0.052)***	(0.040)***
(a) Portfolio	0.255	0.411	0.477	0.452	0.518
	(0.028)***	(0.038)***	(0.032)***	(0.107)***	(0.042)***
(b) Bank Accounts	0.202	0.094	0.066	0.064	0.084
	(0.040)***	(0.041)**	(0.043)	(0.073)	(0.057)
(c) Debt	0.161	0.047	0.106	0.095	0.107
	(0.072)**	(0.056)	(0.035)**	(0.034)***	(0.040)***
(d) Private Pension	0.000	0.000	0.001	0.001	0.004
	(0.011)	(0.011)	(0.013)	(0.017)	(0.011)
(e) Bonds	0.000	0.005	0.005	0.004	0.003
	(0.021)	(0.012)	(0.014)	(0.022)	(0.015)
(f) Capital Insurance	0.002	0.003	0.005	0.003	0.004
	(0.004)	(0.005)	(0.012)	(0.080)	(0.037)
(g) Debt Service	0.012	0.000	0.000	0.000	0.000
	(0.004)***	(0.002)	(0.002)	(0.002)	(0.002)

Notes: The table reports the IV regression of change in one year active financial saving as a function of change in capital gain and dividend income for each wealth group. Portfolio gain and dividend income are instrumented by the passive capital gain and passive dividend income. Both active financial saving and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. Standard errors are clustered at the household level.

Table 5: Realized vs. Unrealized Capital Gain: IV Regression

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.141	0.057	0.065	0.065	0.063
	(0.030)***	(0.013)***	(0.011)***	(0.017)***	(0.014)***
Dividend	0.463	0.334	0.351	0.397	0.393
	(0.109)**	(0.072)***	(0.095)***	(0.099)***	(0.049)***
Realized Capital Gain	0.700	0.425	0.320	0.316	0.290
	(0.064)***	(0.021)***	(0.018)***	(0.027)***	(0.025)***
Disposable income	0.724	0.597	0.585	0.580	0.593
	(0.003)***	(0.006)***	(0.009)***	(0.017)***	(0.016)***
Lag Wealth	0.023	0.025	0.035	0.032	0.023
	(0.001)***	(0.001)***	(0.002)***	(0.001)***	(0.001)***
Observations	771,036	501,804	420,437	121,349	91,315
R-squared	0.168	0.096	0.056	0.047	0.047

Notes: The table reports the result of IV regression of change in consumption, controlling for the realized capital gains. The sample is restricted to years 2005-2007 (i.e. 2006 and 2007 in the difference regressions) when the realized capital gains of households are reported. Portfolio gain and dividend income are instrumented by the passive capital gain and passive dividend income. Both consumption and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. Standard errors are clustered at the household level.

Table 6: Heterogeneity in Liquid Wealth Over Income and Stock Market MPC

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.066	0.045	0.058	0.056	0.048
	(0.017)***	(0.006)***	(0.005)***	(0.008)***	(0.008)***
Return*Buffer-Stock	0.199	0.121	0.167		
	(0.029)***	(0.024)***	(0.032)***		
Dividend	0.396	0.416	0.373	0.304	0.223
	(0.266)	(0.072)***	(0.053)***	(0.053)***	(0.044)***
Div.* Buffer-Stock	0.146	0.133	0.173		
	(0.278)	(0.124)	(0.107)		
Controls	Y	Y	Y	Y	Y
Controls * Buffer-Stock	Y	Y	Y	Y	Y
Observations	2,495,037	1,647,177	1,620,781	361,389	226,328
R-squared	0.130	0.065	0.049	0.041	0.037

Notes: The table reports the IV regression of change in households' consumption as a function of change in capital gain, change in dividend income, as well as those changes interacted with whether the household is a buffer-stock household (i.e. has financial saving less than 6 months of its disposable income). Changes in capital gain and dividend income are instrumented by their passive capital gain and passive dividend income. Both consumption and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. Standard errors are clustered at the household level. See notes of Table 1 for description of variables and the restrictions on the sample.

Table 7: Life Cycle and MPC out of Stock Market Capital Gain

Dependent Variable: Consumption				
	Financial Wealth Percentile	(1) Age<40	(2) 40<Age<55	(3) 55<Age<65
Portfolio Return	5-50	0.073	0.129	0.144
		(0.016)***	(0.046)***	(0.036)***
	50-90	0.018	0.065	0.101
		(0.007)***	(0.007)***	(0.006)***
	90-100	0.010	0.039	0.076
		(0.017)	(0.009)***	(0.008)***
Dividend	5-50	0.255	0.636	0.552
		(0.124)***	(0.131)***	(0.151)***
	50-90	0.270	0.449	0.393
		(0.083)***	(0.044)***	(0.079)***
	90-100	0.249	0.391	0.298
		(0.110)***	(0.047)***	(0.053)***

Notes: The table reports the result of IV regression of change in one year consumption of households as a function of capital gains and dividend income for each age and wealth group. Each cell is related to a separate regression. Portfolio gain and dividend income are instrumented by the passive capital gain and passive dividend income. Both consumption and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. Standard errors are clustered at the household level.

Table 8: Robustness Check I - Controlling for Other Types of Wealth

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.186	0.065	0.067	0.064	0.056
	(0.020)***	(0.007)***	(0.005)***	(0.008)***	(0.008)***
Dividend	0.388	0.476	0.395	0.465	0.334
	(0.083)***	(0.056)***	(0.045)***	(0.051)***	(0.039)***
Home value	0.102	0.044	0.024	0.008	0.030
	(0.879)	(0.020)**	(0.005)***	(0.006)	(0.005)***
Fin. Wealth net	0.310	0.233	0.220	0.169	0.129
of portfolio	(0.020)***	(0.008)***	(0.004)***	(0.016)***	(0.013)***
Disposable income	0.739	0.620	0.608	0.575	0.588
	(0.004)***	(0.004)***	(0.005)***	(0.010)***	(0.010)***
Lag Fin. Wealth	0.036	0.036	0.033	0.024	0.004
	(0.003)***	(0.001)***	(0.001)***	(0.001)***	(0.002)**
Observations	2,495,037	1,647,177	1,620,781	361,389	226,328
R-squared	0.169	0.045	0.072	0.068	0.057

Notes: The table reports the IV regression of change in households' consumption as a function of change in capital gain and dividend income when change in capital gain and dividend income is instrumented by their passive capital gain and passive dividend income. The change in Home value has been instrumented by the change in the average home value at the municipality. Both consumption and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. Standard errors are clustered at the household level. See notes of Table 1 for description of variables and the restrictions on the sample.

Table 9: Robustness Check II – Non-Parametric Controls for Income, Age, Financial Characteristics

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.154	0.091	0.051	0.058	0.043
	(0.033)***	(0.015)***	(0.007)***	(0.009)***	(0.009)**
Dividend	0.206	0.342	0.499	0.355	0.328
	(0.087)***	(0.058)***	(0.043)***	(0.047)***	(0.039)***
Disposable income	0.757	0.681	0.616	0.574	0.586
	(0.002)***	(0.003)***	(0.004)***	(0.010)***	(0.012)***
Lag Wealth	0.034	0.027	0.022	0.018	0.008
	(0.003)***	(0.001)***	(0.001)***	(0.001)***	(0.002)**
Observations	2,340,428	1,647,177	1,620,781	313,740	189,920
R-squared	0.172	0.157	0.156	0.151	0.110

Notes: To get these estimates, we first define 4500 bins based on: ten wealth deciles, nine age groups between 18 and 65, ten income deciles within each wealth group, and five groups based on the share of directly held stocks within each wealth group. Then we repeat the exercise in Table 3 replacing year fixed effects with 4500*6 (27,000) bin-year fixed effects.

Table 10: Robustness Check III – Exploiting Variations between Similar Workers Sharing the Same Employer

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.158	0.097	0.050	0.061	0.046
	(0.049)***	(0.026)***	(0.014)***	(0.024)**	(0.021)**
Dividend	0.659	0.378	0.616	0.164	0.155
	(0.287)**	(0.118)***	(0.059)***	(0.105)	(0.173)
Disposable income	0.728	0.678	0.638	0.563	0.640
	(0.004)***	(0.006)***	(0.009)***	(0.024)***	(0.032)***
Lag Wealth	0.031	0.031	0.023	0.019	0.010
	(0.004)***	(0.002)***	(0.002)***	(0.001)***	(0.002)***
Observations	933,673	705,632	612,663	67,932	37,161
R-squared	0.414	0.408	0.395	0.437	0.428

Notes: To get these estimates, we first define bins based on: each employer (firm) in our sample of households, five wealth quintiles, three age groups between 18 and 65, four income quartiles within each wealth group, and two groups based on the share of directly held stocks within each wealth group. Then we repeat the exercise in Table 3 replacing year fixed effects with bin-year fixed effects.

Table A1: Summary Statistics of Stock Wealth (Survey of Consumer Finances)

	p1	p10	p25	p50	p75	p90	p99	mean	sd	Total ($ Tr)	Share
Panel A: Entire Sample (31240 observations, 126.0m weighted)											
Financial Wealth	0	290	1870	22030	155000	598000	5483600	334212	2470046		
Stock Wealth	0	0	0	3500	91000	420000	3485000	217799	1558938	27.44	45.33
Directly Held Stocks	0	0	0	0	0	7000	800000	45577	1068106	5.74	
Quasi-liquid Retirement	0	0	0	1100	67000	310000	1712000	119074	413807	15.00	
Stock Mutual Funds	0	0	0	0	0	0	1000000	47141	647061	5.94	
Combination and Other	0	0	0	0	0	0	25000	6007	282337	0.76	
Panel B: 0 – 50th percentile of financial wealth (12723 observations, 63.0m weighted)											
Financial Wealth	0	70	415	1870	7000	14000	20900	4600	5689		
Stock Wealth	0	0	0	0	0	5000	17200	1358	3588	0.09	7.26
Directly Held Stocks	0	0	0	0	0	0	1700	71	753	0.00	
Quasi-liquid Retirement	0	0	0	0	0	5000	16300	1259	3426	0.08	
Stock Mutual Funds	0	0	0	0	0	0	0	27	452	0.00	
Combination and Other	0	0	0	0	0	0	0	0	0	0.00	
Panel C: 50th – 70th percentile of financial wealth (5086 observations, 25.2m weighted)											
Financial Wealth	22405	26000	33100	51050	72700	89700	102500	54238	23403		
Stock Wealth	0	0	7000	25000	48000	70000	100000	30233	26302	0.76	8.92
Directly Held Stocks	0	0	0	0	0	2000	30000	1471	6122	0.04	
Quasi-liquid Retirement	0	0	1300	22500	45000	66000	100000	27536	26046	0.69	
Stock Mutual Funds	0	0	0	0	0	0	32000	1207	6493	0.03	
Combination and Other	0	0	0	0	0	0	0	19	486	0.00	
Panel D: 70th – 90th percentile of financial wealth (6153 observations, 25.2m weighted)											
Financial Wealth	10500	121790	155000	221000	348000	473000	583100	261042	130628		
Stock Wealth	0	10000	90000	152000	251000	3800000	530000	178361	131877	4.49	15.22
Directly Held Stocks	0	0	0	0	0	30000	200000	11716	41764	0.30	
Quasi-liquid Retirement	0	0	50000	1240000	220000	348000	502000	151216	127929	3.81	
Stock Mutual Funds	0	0	0	0	0	45000	240000	13982	46628	0.35	
Combination and Other	0	0	0	0	0	0	50000	1447	13750	0.04	

Panel E: 90th – 95th percentile of financial wealth (2032 observations, 6.3m weighted)											
Financial Wealth	601300	628800	687700	818520	1007200	1174000	1279600	860926	199193		
Stock Wealth	0	258000	466000	632000	810000	990100	1180000	628396	275100	3.96	26.04
Directly Held Stocks	0	0	0	0	60000	250000	700000	70909	148823	0.45	
Quasi-liquid Retirement	0	1700	200000	483000	687000	888000	1140000	46474310	311287	2.93	
Stock Mutual Funds	0	0	0	0	75000	366000	700000	81845	166307	0.52	
Combination and Other	0	0	0	0	0	0	800000	10897	82580	0.07	
Panel F: 95th – 100th percentile of financial wealth (5246 observations, 6.3m weighted)											
Financial Wealth	1318620	1444000	1687000	2321200	4471000	8783706	31747800	4514836	10135079		
Stock Wealth	3400	718000	1228000	1654000	3000000	5780000	18860000	2878748	6370769	18.14	58.71
Directly Held Stocks	0	0	0	70000	554000	1600000	7620000	786965	4711884	4.96	
Quasi-liquid Retirement	0	109800	450000	935000	1558000	2357000	5300000	1188709	1344288	7.49	
Stock Mutual Funds	0	0	0	100000	800000	2000000	9120000	799722	2780943	5.04	
Combination and Other	0	0	0	0	0	50000	1810000	103353	1255571	0.65	

Note: This table reports summary statistics of household stock wealth and its components, as reported by the Survey of Consumer Finance (SCF). Each observation refers to a household-year. The sample includes observations for the year 2016. Because the SCF is not an equal-probability design (some types of households are overrepresented, particularly those with higher financial wealth), the Federal Reserve assigns analysis weights to each household in the sample. These weights were used in calculating the summary statistics reported above, and each panel reports the number of actual observations used as well as the equivalent number of observations in the weighted sample. Stock wealth is the sum of directly held stocks, quasi-liquid retirement accounts, stock mutual funds, and combination(/other) mutual funds. Share is the share of stock wealth for each group that is outside the retirement accounts.

Table A2: Summary of Literature Review

Panel A: Wealth Effects in Aggregate Data				
	Country/Data	Sample Period	MPC	Elasticity
Davis and Palumbo (2001)				
Financial Wealth	US/FFA and NIPA	1960-2000	0.057	0.07
Nonfinancial Wealth			0.08	0.36
Case et al. (2011)				
Financial Wealth	USA States/FFA, SCF, CPH	USA : 1978-2009	0-0.06	-
Housing Wealth			0.04-0.15	-
Carroll et al. (2010)				
Financial Wealth	USA/FFA and NIPA	1960-2007	0.06	-
Housing Wealth			0.09	-
Carroll and Zhou (2012)				
Financial Wealth	USA/Various	2001-2005	0.00*	-0.02*
Housing Wealth			0.05	0.24

Panel B: Wealth Effects in Survey Data				
	Country/Data	Sample Period	MPC	Elasticity
Dynan and Maki (2001)				
Equity	USA/CEX	1983-1999	0.05-0.15	-
Guido et al. (2006)				
Financial Wealth	Italy/SHIW	1991-2002	0.04	-
Housing Wealth			0.02	0
Baker et al. (2007)				
Total Stock Returns	USA/CEX	1988-2001	-0.01*	0.004*
Dividends			0.75	0.23
Grant, Peltonen (2008)				
Equity	Italy/SHIW	1989-2002	0.004	-
Housing Wealth			0.08	-
Bostic et al. (2009)				
Financial Wealth	USA/FFA and CEX	1989-2001	-	0.02
Housing Wealth			-	0.06
Paiella, Pistaferri (2015)				
Financial Wealth	Italy/SHIW	2008-2010	-	-0.07*
Housing Wealth			-	0.03

Notes: * Not statistically significant

Table A3: Sample Selection

Criteria Applied	Number of Observations Remaining
Households whose head is between the ages of 18 and 65	20,406,435
Participated in the stock market in two consecutive periods	12,813,758
Fixed number of family members across the two periods	10,895,293
No entrepreneurs in household in two consecutive periods	9,911,965
Did not move across municipalities and did not have real estate cash flow in two consecutive periods	8,643,639
Did not own derivatives	8,460,112
No unidentified dividend	7,156,787
Drop households for which financial asset return is in the top or bottom 1% of the distribution in each year	7,029,328
Drop households for which change in financial cash flow is in the top or bottom 2.5% of the distribution in each year	6,789,877
Drop households for which dividend over 3-year average income is in the top 0.5 percent of the distribution	6,751,108
Drop households for which capital gain or consumption over 3-year average income is in the top or bottom 0.5 percent of the distribution	6,624,248
Drop households with negative consumption	6,350,712

Table A4.1: First Stage for the Capital Gain

Panel A: First Stage with Controls					
	Dependent Variable: Capital Gain				
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Passive Capital Gain	0.776	0.783	0.830	0.831	0.856
	(0.005)***	(0.002)***	(0.002)***	(0.003)***	(0.004)***
Passive Dividend	0.396	-0.535	-0.670	-0.773	-0.703
	(0.053)***	(0.039)***	(0.038)***	(0.091)***	(0.078)***
Income	-0.001	-0.004	-0.005	-0.015	-0.026
	(0.000)***	(0.001)***	(0.001)***	(0.002)***	(0.003)***
Lag Financial Wealth	-0.001	-0.001	-0.001	-0.000	-0.000
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)
Observations	2,495,037	1,647,177	1,620,781	361,389	226,328
R-squared	0.466	0.625	0.660	0.713	0.752

Panel B: First Stage without Controls					
	Dependent Variable: Capital Gain				
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Passive Capital Gain	0.777	0.783	0.831	0.832	0.856
	(0.005)***	(0.002)***	(0.002)***	(0.003)***	(0.004)***
Passive Dividend	0.387	-0.548	-0.687	-0.773	-0.695
	(0.053)***	(0.039)***	(0.038)***	(0.090)***	(0.077)***
Observations	2,495,037	1,647,177	1,620,781	361,389	226,328
R-squared	0.465	0.624	0.660	0.713	0.752

Table A4.2: First Stage for the Dividend Income

Panel A: First Stage with Controls					
	Dependent Variable: Dividend Income				
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Passive Capital Gain	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Passive Dividend	0.357	0.341	0.315	0.272	0.318
	(0.008)***	(0.003)***	(0.003)***	(0.012)***	(0.005)***
Income	-0.000	-0.000	-0.000	-0.000	-0.001
	(0.000)***	(0.000)***	(0.000)***	(0.000)	(0.000)***
Lag Financial Wealth	0.000	0.000	0.000	0.000	0.000
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)**
Observations	2,495,037	1,647,177	1,620,781	361,389	226,328
R-squared	0.059	0.088	0.117	0.133	0.155

Panel B: First Stage without Controls					
	Dependent Variable: Dividend Income				
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Passive Capital Gain	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Passive Dividend	0.357	0.341	0.316	0.273	0.319
	(0.008)***	(0.003)***	(0.003)***	(0.012)***	(0.005)***
Observations	2,495,037	1,647,177	1,620,781	361,389	226,328
R-squared	0.058	0.087	0.115	0.132	0.155

Table A5: Stock Returns and Consumption: IV Regressions without Controls

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.116	0.046	0.040	0.041	0.042
	(0.016)***	(0.006)***	(0.005)***	(0.008)***	(0.008)***
Dividend	0.227	0.275	0.357	0.431	0.248
	(0.092)***	(0.074)***	(0.050)***	(0.053)***	(0.051)***
Observations	2,495,037	1,647,177	1,620,781	361,389	226,328
R-squared	0.015	0.013	0.007	0.005	0.005

Notes: The table reports the IV regression of change in one year consumption of households as a function of change in capital gain and change in dividend income when change in capital gain and dividend income is instrumented by their passive capital gain and passive dividend income: $X_{it-2}.\left(r_{st}^{inst} - r_{st-1}^{inst}\right)$ and $X_{it-2}.\left(div_{st}^{inst} - div_{st-1}^{inst}\right)$ where X_{it} is the vector of stockholdings weights of individual *i* at time *t*; while r_{st}^{inst} and div_{st}^{inst} are vectors of stock returns and dividends, as defined in section 3 of the paper. Both consumption and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. Standard errors are clustered at the household level.

Table A6: Stock Returns and Consumption: IV Regressions (Including Negative Consumption Values)

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.137	0.057	0.052	0.059	0.055
	(0.015)***	(0.006)***	(0.005)***	(0.008)***	(0.008)***
Dividend	0.365	0.451	0.341	0.381	0.282
	(0.081)***	(0.058)***	(0.047)***	(0.051)***	(0.043)***
Disposable income	0.719	0.591	0.591	0.573	0.583
	(0.002)***	(0.004)***	(0.005)***	(0.010)***	(0.010)***
Lag Wealth	0.026	0.035	0.034	0.024	0.004
	(0.000)***	(0.000)***	(0.001)***	(0.001)***	(0.002)**
Observations	2,499,168	1,650,726	1,622,821	361,719	226,485
R-squared	0.127	0.063	0.045	0.039	0.036

Notes: The table reports the IV regression of change in households' consumption as a function of change in capital gain and dividend income when change in capital gain and dividend income is instrumented by their passive capital gain and passive dividend income: $X_{it-2}.\left(r_{st}^{inst} - r_{st-1}^{inst}\right)$ and $X_{it-2}.\left(div_{st}^{inst} - div_{st-1}^{inst}\right)$ where X_{it} is the vector of stockholdings weights of individual *i* at time *t*; while r_{st}^{inst} and div_{st}^{inst} are vectors of stock returns and dividends, as defined in section 3 of the paper. Both consumption and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. Standard errors are clustered at the household level. See notes of Table 1 for description of variables and the restrictions on the sample.

Table A7: Summary Statistics for Realized and Total Capital Gain for 2005-07

	p1	p10	p25	p50	p75	p90	p99	mean	sd
Panel A: Entire Sample (2.95 m observations)									
Capital Gain	-57.66	-1.64	0.092	2.788	15.74	52.19	262.0	17.79	58.16
Normalized Capital Gain	-0.178	-0.00589	0.0004	0.011	0.0579	0.183	0.834	0.0604	0.170
Realized Gain	-10.48	0	0	0	1.672	12.09	104.2	5.282	26.36
Normalized Realized Gain	-0.034	0	0	0	0.0057	0.0401	0.337	0.0175	0.0829
Panel B: 0 - 50th percentile of financial wealth (1.03 m observations)									
Capital Gain	-5.393	-0.215	0.0265	0.512	2.825	7.087	19.92	2.146	4.989
Normalized Capital Gain	-0.0288	-0.00103	0.00013	0.00255	0.0141	0.0394	0.164	0.0135	0.0395
Realized Gain	-2.932	0	0	0	0.145	1.485	11.39	0.512	4.660
Normalized Realized Gain	-0.0156	0	0	0	0.0007	0.0072	0.0738	0.0032	0.0247
Panel C: 50th - 70th percentile of financial wealth (871 k observations)									
Capital Gain	-20.96	-1.427	0.357	3.99	13.35	25.83	59.4	8.414	14.95
Normalized Capital Gain	-0.0864	-0.00464	0.0011	0.0134	0.0475	0.109	0.392	0.038	0.0888
Realized Gain	-8.275	0	0	0	1.343	6.840	33.66	2.049	10.16
Normalized Realized Gain	-0.0292	0	0	0	0.0043	0.0244	0.171	0.0093	0.0462
Panel D: 70th - 90th percentile of financial wealth (786 k observations)									
Capital Gain	-47.00	-4.415	0.906	10.35	31.74	57.13	118.1	18.78	30.84
Normalized Capital Gain	-0.227	-0.0191	0.00311	0.0401	0.130	0.280	0.832	0.0926	0.185
Realized Gain	-15.04	0	0	0	4.122	16.17	67.81	4.809	17.76
Normalized Realized Gain	-0.0518	0	0	1.63E-5	0.0174	0.0716	0.387	0.0251	0.091
Panel E: 90th - 95th percentile of financial wealth (156 k observations)									
Capital Gain	-160.4	-23.38	1.266	37.02	116.3	201.2	379.4	64.35	103.4
Normalized Capital Gain	-0.477	-0.0612	0.00364	0.101	0.315	0.601	1.329	0.192	0.326
Realized Gain	-31.43	0	0	1.631	20.86	62.68	219.5	19.37	49.74
Normalized Realized Gain	-0.0781	0	0	0.00409	0.0539	0.174	0.743	0.0587	0.161
Panel F: 95th - 100th percentile of financial wealth (104 k observations)									
Capital Gain	-339.3	-62.64	-1.923	61.10	213.9	381.2	788.7	115.5	211.7
Normalized Capital Gain	-0.759	-0.145	-0.00462	0.150	0.511	0.917	1.632	0.273	0.467
Realized Gain	-41.61	0	0	6.905	46.00	123.5	398.8	39.72	88.18
Normalized Realized Gain	-0.0864	0	0	0.0153	0.104	0.292	1.062	0.0975	0.225

Table A8: Stock Returns and Consumption: 2006-7

Dependent Variable: Consumption					
	(1)	(2)	(3)	(4)	(5)
Wealth Group	5_50	50_70	70_90	90_95	95-100
Portfolio Return	0.095	0.049	0.067	0.069	0.070
	(0.030)***	(0.013)***	(0.011)***	(0.017)***	(0.014)***
Dividend	0.467	0.387	0.392	0.443	0.424
	(0.109)***	(0.071)***	(0.096)***	(0.093)***	(0.047)***
Disposable income	0.716	0.561	0.521	0.493	0.512
	(0.003)***	(0.006)***	(0.008)***	(0.016)***	(0.015)***
Lag Wealth	0.023	0.025	0.035	0.032	0.023
	(0.000)***	(0.000)***	(0.001)***	(0.001)***	(0.001)***
Observations	771,036	501,804	420,437	121,349	91,315
R-squared	0.165	0.091	0.052	0.043	0.042

Notes: The table reports the IV regression of change in households' consumption as a function of change in capital gain and dividend income when change in capital gain and dividend income is instrumented by their passive capital gain and passive dividend income: $X_{it-2}.\left(r_{st}^{inst} - r_{st-1}^{inst}\right)$ and $X_{it-2}.\left(div_{st}^{inst} - div_{st-1}^{inst}\right)$ where X_{it} is the vector of stockholdings weights of individual *i* at time *t*; while r_{st}^{inst} and div_{st}^{inst} are vectors of stock returns and dividends, as defined in section 3 of the paper. The sample is restricted to the 2005-2007 period (2006-2007 difference) for which we have data on realized capital gains Both consumption and the right hand side variables have been normalized by a three-year (*t-1. t-2, and t-3*) average disposable income. Standard errors are clustered at the household level. See notes of Table 1 for description of variables and the restrictions on the sample.