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Tax Regimes and Capital Gains Realizations

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TAX REGIMES AND CAPITAL GAINS REALIZATIONS

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Abstract

This paper analyzes the effects of progressive versus proportional taxation on capital gains realization behavior. Using a comprehensive panel of over 230,000 individuals in Sweden for 1973-1996, this paper shows after progressive capital gains taxes were cut from over 80% in the 1980s to a proportional tax rate of 30% in 1991, especially high-income taxpayers increased capital gains realizations. The reaction to the introduction of the proportional capital gains tax rate is more pronounced among younger individuals. This paper also shows that under a progressive (proportional) tax regime, investors with excess income are less (more) likely to realize capital gains than individuals with liquidity constraints. Hence, proportional versus progressive taxation plays an important role in capital gains realizations of private investors.

Keywords: Capital Gains Tax, Proportional Tax, Progressive Tax, Top Incomes, Life-Cycle

JEL Classification: H20, H24, D14, D31,

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1 Introduction

The taxation of capital gains is one central feature of income tax systems around the world and offers one important potential channel of affecting the composition of income, distribution of realized capital gains and saving patterns over the life-cycle. Yet, tax authorities adapt a large variety of capital gains tax rules and tax capital gains either at the progressive marginal income tax rate (for example in Canada, Australia, and short-term gains in the U.S.) or at a proportional tax rate (Finland, Japan or long-term gains in the U.S.).¹ Along with numerous income tax reforms over the past two decades, many tax authorities substantially revised capital gains taxation for example by broadening tax bases or introducing proportional tax rates.

The empirical relevance of progressive and proportional capital gains taxation and the influence on capital gains realizations have not been well tested. Despite the general agreement that taxes affect individual portfolio decisions, little is known about the impact of different tax regimes on capital gains realizations over the life-cycle. As capital gains are taxed upon realization, individuals are able to lower their effective tax burden by postponing the realization. This “lock-in effect” and its effect on trading decisions has been addressed in theoretical (see, among others, Constantinides, 1983; Auerbach, 1989, 1991; Klein, 1999; Poterba, 2002; Shackelford and Verrecchia, 2002; Auerbach and Bradford, 2004) as well as empirical studies (for example Burman and Randolph, 1994; Lang and Shackelford, 2000; Seida and Wempe, 2000; Poterba and Weisbenner, 2001; Ivković, Poterba, and Weisbenner, 2005; Dai, Maydew, Shackelford, and Zhang, 2008 for the U.S. and Daunfeldt, Praski-Ståhlgren, and Rudholm, 2010 for Sweden). Most of the empirical studies on tax reforms focus on changes in marginal progressive tax rates (U.S. tax reforms of 1987, 1997 and 2003) and are based on aggregated time-series data or firm-data without information on individual characteristics of the supply side such as income, wealth or demographic factors.² However, despite extensive research on capital gains tax-

¹Capital gains tax rules additionally vary between countries with respect to the holding period (for example Australia, Denmark, and the U.S.) and share in equity (Austria, Germany, and Italy). That is, capital gains are taxed at higher rates if they are short-term and/or if they arise from disposal of substantial shareholdings.

²There are some studies based on micro data. For example, Ivković, Poterba, and Weisbenner (2005) use data on individual investments provided by a large discount broker house to analyze tax-motivated

ation, the effects of progressive versus proportional tax rates on capital gains realizations remain disputed because of the lack of tax regime variation within one country.

This paper uses the 1991 tax reform in Sweden to analyze the effect of progressive and proportional tax rates on capital gains realizations by individuals. In the early 1990s, the Scandinavian countries (Sweden in 1991, Norway in 1992, Finland in 1993) implemented dual income tax systems. The taxation of capital income at progressive income tax rates was reformed to a proportional capital tax for all individuals. The choice of Sweden and the 1991 tax reform offers a unique setting for three reasons: First, the most far-reaching tax reform in the 20th century with a volume of six percent of gross domestic product (Agell, Englund, and Södersten, 1996) introduced a separate, flat-taxed schedule for capital income. After the reform, interest, dividends, and capital gains are taxed at a rate of 30% irrespective of the overall income. Second, as top marginal tax rates on capital income in Sweden fell from over 80% in the 1980s to a proportional tax of 30%, especially top incomes experienced a substantial tax cut on capital gains. Third, this study uses a micro panel data set of over 230,000 individuals in the 1971-1996 period. The LINDA database (Longitudinal INdividual DAta) is a comprehensive panel with information on taxable income, wealth, and demographic characteristics of around 3.35% of the Swedish population. This data set allows analyzing how individuals react to this fundamental change in capital gains taxation and how progressive as opposed to proportional capital gains taxation affects the timing of capital gains. My empirical strategy is a before-and-after comparison of individual capital gains realization behavior. The main findings are as follows.

First, the sum of realized capital gains and the percentage of individuals realizing capital gains are highly correlated with the stock market development between 1973 and 1996. 1991 is an exception in this evolution: The share of individuals realizing capital gains as well as the sum of capital gains increase significantly despite the economic downturn and a negative stock market development with an average annual stock return of -18% in

trading decisions and the “lock-in effect”. However, this data set does not include information on individual income or demographic factors. Daunfeldt, Praski-Ståhlgren, and Rudholm (2010) use a comprehensive micro data set but lack identifying cross-sectional variation in capital gains tax rates between individuals during their sample period. Jacob (2010) uses two 10% random samples of all German income tax statements in 2001 and 2004 and shows that the propensity to realize capital losses (gains) increases (decreases) in the marginal (progressive) income tax rate on short-term capital gains.

1991. The aggregated time-series evaluation shows that the top percentile of the income distribution accounts for about 60% of the 1991 surge in aggregated capital gains. I further estimate differences in capital gains realization activity around the 1991 reform and add controls for income, wealth, demographic factors, and regional disparities for two samples of six and twelve years around the tax reform. The estimated magnitudes are large. After the reform, capital gains realization activity increased by 1.6 (2.9) percentage points in the six (twelve) year period around the reform. These effects equal 32% (62%) of the unconditional prereform average. In contrast, average capital gains fell by SEK 18,039 (SEK 46,163). Furthermore, the 1991 reform has a substantial impact on the distribution of realized capital gains among individuals. In the 1970s and 1980s, the top percentile (top decile) of the income distribution realizes about 13% (20%) of all capital gains without significant time trend. After the reform, the share of the top percentile (decile) surges by 22 percentage points (15 percentage points). As a result, the concentration of realized capital gains among high incomes is substantially larger under the proportional tax.

Second, to account for the economic situation in Sweden in the early 1990s, I explore the tax response by analyzing the heterogeneity of the effect across individuals. Individuals in the top marginal tax bracket had the strongest incentive to realize capital gains. I turn to parametric tests in the form of linear regressions which simultaneously estimate the response of different income percentiles to the tax reform. These regressions allow for more detailed controls and include county as well as individual fixed effects. As expected, higher income percentiles increase their postreform realization activity to a larger extent than investors in the lower income percentiles. Thanks to the panel structure and the large number of observations, I am able to estimate effects for each income percentile. The effect of the reform on the likelihood to realize capital gains increases in the income percentile. These effects are robust to several additional tests. To address concerns that the reaction to the reform is simply a one-time effect, I estimate the effects without 1991.³ After controlling for the immediate short-term reaction, results are very similar. Hence, the transition of a progressive to a proportional taxation appears to have long-term effects on capital gains realizations and consequently on tax revenues.

³For the twelve year sample, I additionally exclude 1994. In this year, all individuals faced a proportional capital gains tax rate of 12.5%. Results are very similar when excluding 1991 and 1994.

Third, I analyze how proportional versus progressive taxation affects capital gains realizations over the life-cycle. A simple life-cycle model of consumption and savings (see, for instance, Attanasio and Browning (1995), Carroll (1997), Gourinchas and Parker (2002), Gomes and Michaelides (2005) as well as Browning and Lusardi (1996) and Attanasio and Weber (2010) for literature overviews) integrates three different motives that have been empirically identified. First, younger individuals buffer stocks for precautionary reasons. Second, individuals save for their retirement to maintain their working-life labor income. Third, individuals dissave when they are old. Prior to the reform, individuals have an incentive to postpone capital gains until retirement when they face lower marginal tax rates. Under a proportional tax, the benefits from postponing realizations are much lower as investors face the same nominal tax rate over their life-cycle. The comprehensive panel data allows analyzing these effects. Before 1991, capital gains realizations increase in age and are in line with the simple life-cycle model. 26% of individuals aged 60 to 70 in the top percentile of the income distribution realize capital gains in the 1988-1990 sample. The fraction is 5.4 percentage points lower among 30 to 40-year-olds. After the reform, realization activity between old and young individuals converges. The estimated effects after controlling for income, wealth, and demographics are large. For the six (twelve) year period around 1991, the likelihood that 30 to 40-year-olds realize capital gains surges by 15.9 (23.3) percentage points – a 9.2 (8.9) percentage points higher increase than for the 60 to 70-year-olds. This suggests that the age of the average investor realizing capital gains is significantly lower when capital gains are taxed at proportional as opposed to progressive rates.

Finally, I examine the role of liquidity constraints at the individual level around the 1991 tax reform. In general, the likelihood that individuals realize accrued capital gains is higher when current income is below average income. Apart from compensating such liquidity constraints by selling assets, temporary lower capital gains additionally incentivize individuals to realize capital gains. In contrast, if current income exceeds the average income, temporary higher tax rates can “lock-in” accrued capital gains. However, both tax effects are irrelevant under a proportional tax. The longitudinal character of the data set allows the identification of these effects. When sorting by the deviation of current

income from the average income of the three preceding years I find that individuals with liquidity constraints (current income < average income) are more likely to realize capital gains than individuals with excess income (current income > average income) under progressive taxation. The estimated effects are again large. For the top percentile (top decile) of the income distribution, the likelihood of realizing capital gains increases by 22.6 (25.3) percentage points if the individual has lower current income as opposed to excess income. This relation changes after 1991. In fact, individuals with excess income are now *more* likely to realize capital gains than individuals with temporary lower income. The difference estimate between both groups with control variables is 18.7 (13.5) percentage points. The reasons for this result are twofold. First, individuals with excess income increase capital gains realization activity as they are not locked-in by temporary higher tax rates. Second, individuals with liquidity constraints cut capital gains realizations by about 13% of the prereform average. This test shows that the motive behind capital gains realizations appears to differ substantially between proportional and progressive taxation.

The results have major implications for policy makers. Apart from finding evidence of the “lock-in” effect of capital gains taxation, this paper shows that a fundamental change in capital gains taxation and the introduction of a proportional capital gains tax rate significantly affects the distribution of realized capital gains. Progressive taxation locks-in capital gains of tax sensitive, rich individuals. In contrast, a proportional tax increases concentration of realized capital gains among top incomes. Second, the transition of a progressive to proportional capital gains taxation substantially affects capital gains realizations over the life-cycle and the timing of capital gains. Individuals’ capital gains tax planning activities become less important under proportional taxation. Consequently, motives behind capital market transactions, for example the importance of liquidity constraints, differ between proportional and progressive taxation. The remainder of this paper is in five sections. In Section 2, I briefly discuss the 1991 tax reform and the data. Section 3 provides descriptive statistics of the evolution of capital gains in Sweden. Section 4 analyzes the impact of the 1991 tax reform on selling activity and timing of capital gains realizations. Section 5 finally concludes.

2 The Swedish Tax Reform and Data

2.1 The 1991 Tax Reform

In 1991, Sweden thoroughly revised the income tax system and moved away from a *global* income system to a *dual* income tax. The latter taxes earned income such as labor or pensions separately from capital income (see Sørensen, 1994, for an overview). The reform was heavily discussed in the late 1980s and finally signed in 1990. The old tax system encouraged tax avoidance and tax planning, for example by shifting income among family members.⁴ For many years, net revenue from capital taxes was negative as especially individuals in the top marginal income tax bracket deducted interest expenses against highly taxed labor income (Agell, Englund, and Södersten, 1996). In contrast, income from capital assets, particularly owner-occupied housing, was tax-preferred with low imputed rents and generous indexation schemes. The 1991 tax reform reduced (global) marginal income tax rates from 36-72% to a progressive tax rate of 31-51% on earned income and to a proportional tax rate of 30% on capital income. Furthermore, the corporate tax rate was lowered from 52% to 30%. The Swedish tax authority further substantially broadened tax bases and eliminated various tax shelters and loopholes in the income as well as the corporate tax code.

The introduction of the proportional tax of 30% implied dramatic changes in the taxation of capital gains. Prior to the reform, the individual's marginal income tax rate and the holding period determined the capital gains tax burden on listed shares. Individuals were allowed to exclude 60% (50% in 1990) of long-term capital gains from their taxable income. Shareholdings qualified for long-term gains after a holding period of two years. As of 1991, nominal capital gains were taxed at 30% regardless of the individual income and the holding period. The capital gains tax rate was further lowered in 1992 to 25% and to 12.5% in 1994. From 1995, the capital gains tax rate was increased again to the 1991 level of 30%. For an individual in the top marginal income tax bracket, the marginal tax rate on long-term gains on shares slightly increased from 28.8% in 1989

⁴For a comprehensive overview on the implications of the 1991 tax reform in Sweden see Agell, Englund, and Södersten (1998).

to 30% while the marginal tax rate on short-term gains decreased by 42 percentage points to 30%. Exemptions for long-term capital gains and indexations schemes for gains on the sale of private real estate have been eliminated and nominal gains are taxed at rate of 30%. However, certain provisions for real estate such as an alternative tax of 9% of the sales price of permanent residences or the possibility to postpone the tax liability were maintained. In sum, the introduction of the dual income tax and the proportional capital gains tax led to a substantial drop in the marginal tax burden of short-term shareholdings for individuals in the top income tax bracket. Individuals in lower tax brackets faced higher tax rates on long-term capital gains.

2.2 Data

This study is based on a comprehensive panel data set (Longitudinal INdividual DATA - LINDA) that covers 1971 through 1996.⁵ This unique data set is provided by Statistics Sweden and represents about 3.35 percent of the Swedish population in each year. It contains information on income, wealth, employment status, education, housing, and demographic characteristics such as age, gender, marital status, and household size.⁶ The principle data sources are income registers as well as the population and housing census. Edin and Fredriksson (2000) provide a detailed description of LINDA, its sources, and variables. Data on average annual stock returns of the Swedish market are based on the *Affärsvärldens General Index*. This index is a broad market index including all listed firms on Stockholm's main market. Until 1979, average annual stock returns are based on monthly stock prices and on daily prices thereafter.

From the original data set, I restrict my analysis to individuals with information on income and demographic characteristics for at least five consecutive years. Furthermore, I exclude all observations where the individual's age is below 18. To prevent extreme values and outliers from distorting the results, I further eliminate observations of income

⁵I restrict my sample to the 1971-1996 period to avoid overlapping effects with changing stock market activity in Sweden. In 1997, the first online bank opened and transaction costs declined substantially in the following years.

⁶Information on wealth is only available if the total wealth exceeds a certain threshold which for example amounted to 900,000 Swedish Kronor (SEK) in 2000. This converts into 98,127 USD using the 2000 average exchange rate of 9.1718 SEK/USD.

and income volatility that are not within the 0.01st and the 99.9th percentile of observations. As there were major changes in the tax legislation from 1980 to 1985 (see among others Södersten, 1993), I restrict regression analyses to the 1985-1996 period. 1985 is a reasonable choice for the start of the prereform period to ensure an almost constant capital gains tax regime for the analyses in Section 3 and 4.

2.3 Dependent and Independent Variables

Table 1, Panel A presents summary statistics for the capital gains variables for the 1985-1996 period around the tax reform. The unbalanced panel consists of 258,382 individuals and 2,564,277 observations. The main capital gains measure is $CG_Realized_t$. It is an indicator variable equal to 100 for individuals realizing capital gains in year t and 0 otherwise. Second, CG_Init_t is an indicator variable equal to 100 if an individual realizes a capital gain in t without having realized a capital gain in the prior year $t - 1$, and zero otherwise. CG is the Swedish Kronor (SEK) amount of realized capital gain in year t in thousands. I translate capital gains into real terms (base year 2000) by using the Swedish GNP deflator provided by Statistics Sweden. In the sample, 7.7% of all individual-year observations contains capital gains. This corresponds with an initiations rate (CG_Init_t) of 5.2%. The average realized capital gain amounts to SEK 2,728.

Panel B in Table 1 presents summary statistics for income, wealth, and demographic control variables. $Income_t$ is the individual's taxable income in year t without capital gains. $AvIncome_{t-2,t}$ is the average income from $t - 2$ to t without capital gains. $Delta_Inc_{t-2,t}$ is the difference between current income ($Income_t$) and average income ($AvIncome_{t-2,t}$). $Taxable\ Wealth_t$ is the reported wealth for tax purposes. All values for these control variables are reported in SEK 1,000 and are converted into real terms (base year 2000). On average, income between 1985-1996 amounts to SEK 145,730. The range of values of income and wealth measures is considerable - from SEK 42,510 (10th percentile) to 243,890 (90th percentile) ($Income_t$), SEK 44,310 to 237,220 ($AvIncome_{t-2,t}$), or SEK -23,560 to SEK 32,630 ($Delta_Inc_{t-2,t}$).

Demographic controls include eleven variables (see also Calvet, Campbell, and Sodini 2009a, 2009b; Daunfeldt, Praski-Ståhlgren, and Rudholm 2010). $Town_t$ is an indicator

Table 1: Summary Statistics 1985-1996

This table reports summary statistics for capital gains variables (Panel A), and it presents the basic distribution parameters for income, wealth, and demographic controls (Panel B). *CG_Realized* is an indicator variable equal to 100 for individuals realizing capital gains and 0 otherwise. *CG_Init* is an indicator variable equal to 100 if an individual realizes a capital gain in t without having reported a capital gain in the prior year $t - 1$, and zero otherwise. *CG* is the Swedish Kronor amount of realized capital gain in year t . *Income* is the individual's income in year t without capital gains. *AvIncome_{t-2,t}* is the average income from $t - 2$ to t without capital gains. *Delta_Inc_{t-2,t}* is the difference between current income (*Income*) and average income (*AvIncome_{t-2,t}*). *Std.Dev.inc_{t-4,t}* is the standard deviation of income of individual i in year $t - 4$ to t . *Taxable Wealth* is the reported wealth for tax purposes. All monetary values are reported in real thousand SEK with the base year 2000. *Town* is an indicator variable equal to 100 for individuals residing in towns (usually) with less than 10,000 inhabitants and equal to 0 otherwise. *City* is an indicator variable equal to 100 for individuals residing in cities with more than 10,000 inhabitants and equal to 0 otherwise. *Capital* is an indicator variable equal to 100 for individuals residing in the county's capital and equal to 0 otherwise. *Age* is the individual's age in years. *Married* is an indicator variable equal to 100 if the individual is married and equal to 0 otherwise. *Household Size* represents the number of family members in the household. *HS Inc (HS Dec)* is an indicator variable equal to 100 if the household size increases (decreases) from $t - 1$ to t and 0 otherwise. *BusInc* is an indicator variable equal to 100 if the individual generates income from business activity and 0 otherwise. *SocAss (Pension)* is an indicator variable equal to 100 if the individual receives social assistance (pension) and 0 otherwise.

Panel A: Capital Gains Variables						
Variable	N	Mean	Standard Deviation	10th Percentile	Median	90th Percentile
CG_Realized	2,714,798	7.696	26.653	0	0	0
CG_Init	2,714,798	5.238	22.280	0	0	0
CG	2,714,798	2.728	44.206	0	0	0

Panel B: Income, Wealth, and Demographic Controls						
Variable	N	Mean	Std. Dev.	P10	Median	P90
Income	2,714,798	145.73	107.94	42.51	138.43	243.89
AvIncome _{t-2,t}	2,714,798	142.22	99.15	44.31	135.57	237.22
Delta_Inc _{t-2,t}	2,714,798	2.64	45.90	-23.56	0.39	32.63
Taxable Wealth	2,714,798	98.83	913.02	0	0	0
Town	2,714,798	11.805	32.266	0	0	100
City	2,714,798	73.315	44.231	0	100	100
Capital	2,714,798	35.411	47.824	0	0	100
Age	2,714,798	48.007	19.104	23.00	46.00	75.00
Married	2,714,798	48.485	49.977	0	0	100
Household Size	2,714,798	2.012	1.187	1	2	4
HS Inc	2,714,798	4.715	21.196	0	0	0
HS Dec	2,714,798	6.042	23.826	0	0	0
BusInc	2,714,798	4.978	21.750	0	0	0
SocAss	2,714,798	19.259	39.433	0	0	100
Pension	2,714,798	33.347	47.145	0	0	100

variable equal to 100 for individuals residing in towns and equal to 0 otherwise. Those are all municipalities in Sweden with municipality codes ending in 60 to 79 (“köping”). *City_t* is an indicator variable equal to 100 for individuals residing in cities (municipality codes ending in 80 to 99 – “stad”) and equal to 0 otherwise. *Capital_t* is an indicator variable equal to 100 for individuals residing in the county's capital and equal to 0 otherwise.⁷

⁷The counties (“län”) are the current 21 first level administrative regions in Sweden.

In the sample, 11.8% of individuals reside in smaller towns, 73.3% live in cities and over one third are inhabitants of the respective county capital. Age_t is the individual's age in years. $Married_t$ is an indicator variable equal to 100 if the individual is married and equal to 0 otherwise. $Household\ Size_t$ represents the number of family members in the household. In the sample, around 50% of individuals are married. Average household size is approximately 2 with a standard deviation of 1.2. $HS\ Inc_t$ ($HS\ Dec_t$) is an indicator variable equal to 100 if the household size increases (decreases) from $t - 1$ to t and 0 otherwise. $BusInc_t$ is an indicator variable equal to 100 if the individual generates income from business activity and 0 otherwise. $SocAss_t$ ($Pension_t$) is an indicator variable equal to 100 if the individual receives social assistance (pension) and 0 otherwise.

3 Effect of the 1991 Tax Reform on Capital Gains Realizations

3.1 The Evolution of Capital Gains in Sweden 1973-1996

Figure 1 plots aggregated realized capital gains for the full sample and for the top percentile of the average income distribution between 1973 and 1996.⁸ Total realized capital gains rose from SEK 0.6 billion in 1973 to SEK 9.3 billion in 1996. The trend is similar for the top percentile. Aggregated capital gains increased from SEK 0.1 billion to SEK 2.9 billion. Figure 1 also plots the development of the stock market index in Sweden. The development of the stock market index is very similar to the development of aggregated capital gains except for 1991 and 1994. In fact, the correlation between stock market development and aggregated capital gains is 0.84 for the 1973-1996 sample (see also Roine and Waldenström, 2008).

The 1991 reform led to a surge in aggregated capital gains of 60.5% from SEK 7.4 billion to SEK 11.9 billion despite a 18% decline in the Swedish stock market index. The effect of the 1991 reform is stronger for the top percentile of the income distribution. Aggregated capital gains more than tripled from SEK 0.82 billion to SEK 3.56 billion.

⁸Throughout the paper, percentiles of income distribution are based on three-year average income excluding capital gains.

Figure 1: Income from Capital Gains, 1973-1996

This Figure plots aggregated income from capital gains in billion SEK (2000 prices) for full sample and for the top percentile of the three-year average income distribution (primary x-axis) and the development of the stock market index (secondary x-axis) for the 1973-1996 sample. The sample consists of 5,292,383 observations and 309,486 individuals. The vertical line separates years 1990 and 1991.

The top 1% of the income distribution accounts for over 61% of the total increase in capital gains from 1990 to 1991. The 1991 reform further led to the largest increase in aggregated capital gains within the top percentile during the sample period although it was the year with the third lowest stock market return between 1973 and 1996.

Figure 2: Distribution of Income from Capital Gains, 1973-1996

This Figure plots the fraction of capital gains realized by individuals in the top percentile, the top decile and remaining taxpayers (P0-P90) as percentage of total realized capital gains. The sample consists of 5,292,383 observations and 309,486 individuals. The vertical line separates years 1990 and 1991.

On average, the top 1% of the income distribution realizes almost one quarter of total capital gains over the 1973-1996 period. But, the role of top percentile and top decile

in capital gains realizations changes after the tax reform as shown in Figure 2. Under the progressive tax regime, both, the top percentile and the top decile have a constant share of around 13.4% and 20% respectively without significant trend. The share of total realized capital gains increases significantly after the reform. The surge amounts to 15 percentage points for the top decile and to 22 percentage points for the top percentile to reach a constant level after the reform.⁹ As of 1996, the top percentile, the top decile and the remaining 90% of the population contribute almost similar shares to total capital gains realizations.

However, the trend in aggregated realized capital gains can result from the increasing number of people accessing stock and housing markets. When a larger fraction of individuals sell shares and real estate, the total sum of income from capital gains is expected to increase because more individuals will realize capital gains. Figure 3 addresses this issue and plots the percentage of individuals realizing capital gains in the full sample and the top percentile of the income distribution.

Figure 3: Percentage of Individuals Realizing Capital Gains, 1973-1996

This Figure plots the percentage of individuals with income from capital gains for the full sample and for the top percentile of the three-year average income distribution (primary x-axis) and the development of the stock market index (secondary x-axis) for the 1973-1996 sample. The sample consists of 5,292,383 observations and 309,486 individuals. The vertical line separates years 1990 and 1991.

The percentage of individuals realizing capital gains steadily increased from 1973 to 1996. In early 1970s, only 1.1% of all taxpayers and 7.7% of the top percentile realized

⁹A simple OLS regression with the share of realized gains as dependent variable and year and on a post reform dummy as independent variables yields a significant constant, a significant coefficient for the postreform dummy and an insignificant effect of the year variable.

capital gains. Until 1996, the overall fraction of taxpayers with income from capital gains rose to 18% for the entire sample. In the mid 1990s, three out of five individuals in the top percentile of the income distribution realize capital gains. As observed for aggregated capital gains, the trend in realization activity is positively related to the stock market development. The correlation between stock returns and the change in realization activity is 0.54 for the full sample and 0.41 for the top percentile. From 1990 to 1991, the share of individuals realizing capital gains increased by 2.7 percentage points. As expected, the surge was stronger for the top percentile. The share of individuals with capital gains almost doubled from 20.7% in 1990 to 40.3% in 1991.

Figure 4: Average Income from Capital Gains, 1973-1996

This Figure plots the average income from capital gains for individuals realizing capital gains in thousand SEK (2000 Prices) for the full sample and for the top percentile of the three-year average income distribution (primary x-axis) and the development of the stock market index (secondary x-axis) for the 1973-1996 sample. The sample consists of 5,292,383 observations and 309,486 individuals. The vertical line separates years 1990 and 1991.

Figure 4 plots the average income from capital gains for all taxpayers selling taxable capital gains assets. From 1973 to 1991, the average income from capital gains rose from SEK 26,665 to a peak of SEK 109,185 in 1991. Between 1992 and 1996 average capital gains fell to SEK 30,054. A similar trend can only be observed for the top percentile of the income distribution for the 1973-1990 period. The trend after the reform differs in two ways. First, the top percentile nearly tripled average capital gains from SEK 176,529 in 1990 to SEK 515,574 in 1991. Second and in contrast to all individuals, taxpayers in

the top percentile realized higher average capital gains in the postreform period than in any year of the prereform period.

Figure 5: Capital Gains Initiations and Terminations

This Figure plots the percentage of individuals initiating and terminating capital gains realizations for the full sample and for the top percentile of the three-year average income distribution (primary x-axis) and the development of the stock market index (secondary x-axis) for the 1973-1996 sample. The sample consists of 5,292,383 observations and 309,486 individuals. The vertical line separates years 1990 and 1991.

Finally, Figure 5, Panel A plots the fractions of capital gains initiations and terminations for the full sample. Panel B plots the fractions for the top percentile of the income distribution. Initiations among all individuals (top percentile) rose from 1990 to 1991 by 2.63 (15.8) percentage points. This surge in initiations was the highest increase for the full sample and especially for the top percentile in 1971-1996. Top income individuals more than doubled capital gains initiations in 1991. In both panels, the highest initiation rate is observed in 1994 – the year with a flat capital gains tax of 12.5% and the second consecutive year with positive stock market returns (+22%) after the economic crisis in the early 1990s. Capital gains terminations trends follow the patterns of initiations with a time lag of one year. This finding indicates that capital gains are a transitory component of income. Individuals realize gains in one year but not in the subsequent year.

3.2 Effects of the 1991 Reform

Interpreting time series of aggregated and average capital gains as well as capital gains realization cannot provide precise estimates of tax effects when relevant controls such as wealth, income volatility, family size, financial expertise, and age are excluded. Furthermore, capital gains are very concentrated (see Figure 2 and Roine and Waldenström (2011)). The top percentile accounts for about one quarter of all realized capital gains

from 1973 through 1996. I therefore additionally examine a six-year as well as a twelve-year period around the 1991 reform and integrate relevant control variables to ensure robust estimates of changes in capital gains realizations.

Table 2: Changes in Capital Gains Before and After the 1991 Reform

This table reports the average capital gain realizations, initiations, terminations and realized values prereform (column 1) and postreform (column 2), as well as estimates of the change between the two periods without (column 3) and with controls (column 4). Panel A covers six years around the 1991 tax reform (1988-1993). The sample consists of 234,406 individuals and 1,281,819 observations. Panel B covers the twelve-year period around the tax reform (1985-1996). The second sample consists of 258,382 individuals and 2,564,277 observations. Standard errors of the differences with and without controls (reported in parentheses) allow for heteroskedasticity and are clustered by county-years. ***, **, * indicate statistical significance of the difference at 1%, 5%, and 10% level, respectively.

Panel A: 1988-1993				
	Prereform 1988-1990 (1)	Postreform 1991-1993 (2)	Difference (post- minus prereform) (3)	Difference with controls (4)
Capital Gains	4.934	7.249	2.315	1.577
Realizations (in %)			(0.327)***	(0.190)***
Capital Gains	3.639	5.435	1.796	1.713
Initiations (in %)			(0.246)***	(0.179)***
Average Realized	67.573	41.384	-26.189	-18.039
Capital Gain			(6.873)***	(5.718)***
Panel B: 1985-1996				
	Prereform 1985-1990	Postreform 1991-1996	Difference (post- minus prereform)	Difference with controls
Capital Gains	4.103	11.707	7.604	2.851
Realizations (in %)			(0.638)***	(0.395)***
Capital Gains	3.048	7.774	4.726	2.637
Initiations (in %)			(0.395)***	(0.296)***
Average Realized	55.538	25.355	-30.183	-46.163
Capital Gain			(4.444)***	(4.067)***

Table 2 summarizes the magnitude of the effects on capital gains realizations around the reform. First, Panel A covers three years prior to the reform (1988-1990) and three years after the reform (1991-1993). This sample consists of 234,406 individuals and 1,281,819 observations. Second, an extended period (Panel B) covers twelve years around the reform (1985-1996). Panel B consists of 258,382 individuals and 2,564,277 observations. The first row of Table 2, Panel A shows that the average percentage of capital gains realizations increased by 2.2 percentage points. For the twelve-year period around the tax reform, the surge in capital gains realizations amounts to 7.28 percentage points.

Meanwhile, average realized capital gains decreased by SEK 25,351 for Panel A and by SEK 28,533 for the 1985-1996 period.

The numbers are based on the assumption that no other unobservable determinants of capital gains realization activity changed during the respective time horizon. However, this assumption does not hold given the economic crisis and the fundamental tax reform in 1991 that effectively lowered capital gains tax rates for individuals in the top tax bracket. To ensure robustness of differences between post- and prereform capital gains realizations, I control for a rich set of variables using the comprehensive longitudinal panel data set. I run the following regression for the capital gains variables:

$$CG_{i,t} = \alpha_0 + \beta \cdot Post_t + \sum_{a=1}^3 \gamma_a \cdot I_{i,t-a} + \chi \cdot X_{i,t} + \alpha \cdot County + \epsilon_{i,t} \quad (1)$$

where $CG_{i,t}$ is the respective capital gains measure of individual i in year t . $Post_t$ is a dummy variable for the post reform period taking the value 1 after the enactment of the reform and 0 for years prior to 1991. The first set of control variables are three lags of income and taxable wealth denoted by the vector I .¹⁰ The second set of control variables (vector X) consists of lagged income deviation defined as current income minus three-year average income, marital status, household size, indicator variables for pension, social assistance, business income, and increase as well as decrease in household size. I further include a dummy variable taking the value 1 if the individual resides in a small town, a large city or the county capital. Third, I control for disparities between 21 counties in Sweden and include county fixed-effects ($County$). Throughout the paper, standard errors allow for heteroskedasticity and are clustered by county-years.

The fourth column of Table 2 shows that results for the difference after controls (β) between postreform and prereform differences in capital gains realizations and initiations in Panel A are similar. Adding controls, the estimate of before-and-after difference is 1.6 percentage points – 32% of the unconditional prereform average. In Panel B, the difference with controls is smaller than without controls but still economically significant.

¹⁰As mentioned above, taxable wealth is only available above a certain threshold. The results for $Post_t$ are very similar when excluding wealth from the regression.

In the six years following the reform, the likelihood of realizing capital gains increases by 2.85 percentage points or 69.5% of the unconditional prereform average.

Table 3: Change in Capital Gains Realizations – Robustness Tests

This table reports estimates of the change between the pre- and postreform realizations with controls for the 1988-1993 and the 1985-1996 sample. Column (1) presents results where the sample is restricted to individuals aged between 30 and 60. In Column (1), observations from 1991 and 1994 have been excluded from the regressions. In Column (2), the sample is restricted to individuals with constant income. Observations where income changes by more than 15% are excluded. Column (3) combines restrictions from Column (1) and (2). Results in Column (4) are based on the sample of individuals with constant income, excluding the years 1991 and 1994, and all individuals younger than 30 or older than 60. Column (5) includes control variables for relevance of interest deduction. In Column (6), the sample is restricted to Swedish regions of Småland and the Islands and Northern Central Sweden where the house price index is least volatile. Standard errors (reported in parentheses) allow for heteroskedasticity and are clustered by county-years. NOBS is the number of observations.

	Without 91/94	Constant Income	Const. Inc. w/o 91/94	Const. Inc. w/o 91/94 30≤age≤60	Control for Interest Deduction	Regions with least volatility
	(1)	(2)	(3)	(4)	(5)	(6)
1988	1.534	1.047	1.154	1.188	1.331	1.423
-1993	(0.280)***	(0.159)***	(0.202)***	(0.271)***	(0.166)***	(0.235)***
NOBS	1,070,323	912,621	761,929	397,304	1,281,819	364,842
1985	4.810	3.857	3.857	4.478	4.138	5.149
-1996	(0.454)***	(0.390)***	(0.390)***	(0.473)***	(0.416)***	(0.993)***
NOBS	2,136,257	1,836,217	1,530,181	807,556	1,941,501	729,856

I next turn to several important additional robustness tests for the difference estimates.¹¹ The first concern pertains the long-run responsiveness to a cut in capital gains tax rates. The existing literature on capital gains reaches consensus that short-run elasticity to capital gains tax rates is substantially larger than the long-run elasticity (see, among others, Eichner and Sinai, 2000). One might expect that the reaction to the reform is substantially lower when observations from 1991 and 1994 are excluded. The results in Column 1, however, show that the estimate for the 1988-1993 sample is very similar. For the 1985-1996 sample, the effect (after controls) is even stronger when 1991 and 1994 are excluded. It appears that the significant long-run effect of lower capital gains tax rates largely stems from transition of a progressive capital gains tax to a proportional tax.

Another central concern about the results is the large heterogeneity within groups with respect to income composition, demographic characteristics, and asset allocation. Individuals and households respond differently to economic downturn and tax reforms. So far, the error term picks up some of this heterogeneity. Therefore, I restrict my sample to more homogeneous subpopulations. Column 2 reports difference estimates for

¹¹All robustness tests include control variables from Equation (1).

a sample of individuals with constant income around the reform. That is, individuals are only included if their income did neither decrease nor increase by more than 15% during the economic crisis. For the 1988-1993 period the effect of the tax reform decreases from 1.58 to 1.05 percentage points. In contrast, the effect is much stronger for the twelve-year sample. Results are very similar when I additionally exclude observations from 1991 and 1994 (Column 3) and when I further restrict the sample to individuals aged between 30 and 60 years (Column 4).

I next consider other features of the tax system. The 1991 tax reform substantially lowered tax incentives for owner-occupied housing and changed the deductibility of interest payments on real estate from highly-taxed labor income. As a consequence, the postreform surge in net borrowing costs for some individuals could have triggered the realization of capital gains. Column 5 presents regression results with an additional control for the importance of interest deductions on real estate. The proxy for relevant interest deductions is a dummy variable taking the value 1 if deducted interest amounts to more than 20% of average taxable income. When interest deductions are relevant, individuals may be more likely to sell assets due to liquidity constraints. I ran regressions including this indicator variable and an interaction with the post-reform dummy. First, the estimate for the reform dummy is very similar to the baseline results. Second and as expected, individuals with substantial interest deductions are more likely to realize capital gains and react more to the reform (estimates not reported). Finally, I ran a robustness test where I focus on two Swedish regions (Småland and the Islands and Northern Central Sweden) with the least volatile real estate market. This is to ensure that capital gains realizations were not driven by collapsing regional real estate markets. Again, results are very similar to the baseline effect.

4 Who responded to the Tax Reform?

4.1 High Income Taxpayers and Capital Gains Responses

The section now turns to the question of who responded to the 1991 reform. The tax cut incentivized especially individuals in the top marginal tax bracket to increase their

capital gains realization activity. Their marginal tax burden on short-term capital gains fell from over 70% to 30%. Taxpayers in lower tax brackets benefit from a substantial, albeit weaker tax cut on short-term capital gains. In contrast, they face a higher tax rate on long-term capital gains after the reform. In line with earlier evidence on the “lock-in” effect (see, among others, Reese, 1998; Ivković, Poterba, and Weisbenner, 2005; Dai, Maydew, Shackelford, and Zhang, 2008), I expect that the change in capital gains realization activity increases in income. This prediction is tested with the following linear regression model:

$$\begin{aligned}
CG_{i,t} = & \alpha_0 + \beta_1 \cdot Post_t + \beta_2 \cdot Post_t * P51-60_{i,t} + \beta_3 \cdot Post_t * P61-70_{i,t} \\
& + \beta_4 \cdot Post_t * P71-80_{i,t} + \beta_5 \cdot Post_t * P81-90_{i,t} + \beta_6 \cdot Post_t * P91-99_{i,t} \\
& + \beta_7 \cdot Post_t * P100_{i,t} + v_1 \cdot P51-60_{i,t} + v_2 \cdot P61-70_{i,t} + v_3 \cdot P71-80_{i,t} \\
& + v_4 \cdot P81-90_{i,t} + v_5 \cdot P91-99_{i,t} + v_6 \cdot P100_{i,t} \\
& + \sum_{a=1}^3 \gamma_a \cdot I_{i,t-a} + \chi \cdot X_{i,t} + \alpha \cdot County + \alpha_i + \epsilon_{i,t}
\end{aligned} \tag{2}$$

where $CG_{i,t}$ is the respective capital gains measure of individual i in year t . The indicator variable $P51-60$ takes the value 1 if the individual i is within the sixth decile of the income distribution in year t and 0 otherwise. The dummy variable $P61-70$ refers to individuals in the seventh decile of the income distribution and so forth. The group $P100$ includes all individuals that are within the top percentile of the income distribution in year t . The vectors I and X and the indicator $Post_t$ are defined as in Equation (1). In all regression specifications, I employ county-fixed effects ($County$) and fixed effects at the individual level (α_i). In the regressions, I expect the β coefficients to increase if, as hypothesized, the postreform surge in capital gains realization activity increases in income.

Table 4: Income and the Reaction to the 1991 Tax Reform

This table presents coefficient estimates for differences in post- and prereform capital gain realizations for the 1988-1993 sample and the 1985-1996 sample. Individuals are sorted into percentiles of three-year-average income. The first group accumulates the lowest five deciles (P0-P50). The next groups refer to the sixth to ninth decile of the income distribution. The sixth group consists of the 91st to 99th percentile. Finally, the last group consists of individuals in the top percentile. β_i is the coefficient estimate for the post-reform effect in group i , (se) is the heteroskedasticity-robust standard error clustered by county-years, t-stat is the t-statistic of the significant differences between β_n and β_{n-1} .

	CG_Realized: 1988-1993			CG_Realized: 1985-1996		
	β_i	(se)	[t-stat]	β_i	(se)	[t-stat]
β_1 (P0-P50)	1.580	(0.112)	-	3.679	(0.321)	-
β_2 (P51-P60)	2.786	(0.208)	[0.883]	5.851	(0.442)	[6.069]
β_3 (P61-P70)	3.297	(0.215)	[2.263]	6.778	(0.520)	[5.287]
β_4 (P71-P80)	4.450	(0.228)	[5.850]	8.265	(0.564)	[9.109]
β_5 (P81-P90)	5.780	(0.353)	[5.664]	10.791	(0.764)	[8.806]
β_6 (P91-P99)	9.126	(0.505)	[11.729]	15.772	(1.170)	[9.349]
β_7 (P100)	16.319	(1.033)	[8.442]	23.544	(1.826)	[7.721]
Controls	Yes			Yes		
Observations	1,281,819			2,564,277		
Individuals	234,406			258,382		
R-squared	0.3790			0.2816		

Table 4 summarizes coefficient estimates for β_1 to β_7 , standard errors, and t-statistics of differences between β_n and β_{n-1} . Individuals in all income cohorts significantly increased their realization activity. As expected, beta coefficients increase in income and are significantly different from each other. The response to the tax reform is strongest in higher income percentiles. The probability that an individual in the top percentile realizes capital gains increases by 16.32 (23.54) percentage points from 1989-1990 to 1991-1993 (from 1985-1990 to 1991-1996). The response of the 91st to the 99th percentile is economically significant (9.13 percentage points in Panel A and 15.77 in Panel B) but weaker in comparison to the top income percentile. As expected, the lowest response to the tax reform is estimated for the lowest deciles of the income distribution. I repeat the six robustness tests from above for Equation (2) to address some of the heterogeneity in the data, the inference of the economic crisis, and possible one-time effects of tax reforms. The results are presented in Table A.1 and A.2 and show very similar trends in the reaction to the reform.

An alternative approach to the simultaneous regression can be used if one is concerned about serial correlation at the individual level. I therefore divide individuals into 100 in-

come percentiles and regress the effect of *Post* separately for each subsample. The results for the β coefficients on the propensity to realize capital gains are illustrated in Figure 6. The estimated coefficients are normalized by the unconditional prereform averages. This approach ensures that the results are not misinterpreted. Absolute changes do not recognize differences in stock market participation and prereform realization activity.¹² By normalizing with prereform averages, the estimates reflect relative changes in realization behavior and ensure comparability of results. I then regress the resulting relative increases against the percentile rank. Hence, I simply treat relative coefficients as data points. The effect increases in income percentile rank. The linear regression yields a point estimate of 0.0146 and a very high t-statistic. The R-squared of the hundred-data-point regression is 85.45%.

Figure 6: Difference in Capital Gains Realizations by Income Percentile 1988-1993

This Figure depicts the average increase in the percentage of individuals realizing capital gains in each income percentile. The difference between postreform (1991-1993) and prereform (1988-1990) realization activity is estimated separately for each percentile of the income distribution. The estimated model is defined as in equation (1).

¹²Data on portfolio composition is unfortunately not included in LINDA. For 19,708 individuals in 1989 and 1990, I can derive some aggregated information on portfolio composition from the HINK (Income distribution survey) data set provided by Statistics Sweden. I sort these individuals into deciles in accordance with the income deciles from LINDA. For these deciles I compute average portfolio shares of stocks and funds, cash holdings and real estate. Results (see Figure A.1 in the Appendix) indicate that the relevance of stocks and funds increases in income. 10.8% of average portfolio of an individual in the bottom decile consists of shares and funds. This fraction increases to 20.4% for the top decile. About 44% (70%) of low (high) income individuals own shares, funds or other securities. The importance of real estate (cash holdings) increases (decreases) from 21% (68%) in the bottom decile to 57% (23%) in the top decile.

The estimates are roughly consistent in magnitude and especially in pattern of coefficients in the simultaneous regression. For the first forty percentiles, the difference between post- and prereform realization activity is small and often insignificant. I find positive and statistically significant results for higher percentiles. The likelihood that individuals in the top 20 percentile of the income distribution realize capital gains more than doubled after the reform (relative change $\geq 100\%$). The results are very similar when analyzing the 1985-1996 sample.

Again, one could be concerned that this pattern is driven by the economic crisis. If the reaction to the crisis was concentrated among rich and sophisticated investors, I would misinterpret crisis effects as tax effects. I address this concern by repeating the percentilewise regressions around the stock market crash around 2001.¹³ The pattern of the relative coefficients around 2001 (see Figure A.2 in the Appendix) differs substantially from the pattern around 1991. The pattern is hump shaped and the reaction is negative for the top incomes who realized less capital gains (or losses) after the crisis. In contrast to 1991, the relative response is very small and often insignificant. Hence, it appears that the reaction in 1991 is mainly driven by the introduction of the proportional tax and less by the economic crisis.

To understand the reaction to the tax reform I additionally examine if individuals realize windfall gains by selling and immediately reinvesting in shares. As information on shareholdings are not available in the data set, I proxy shareholdings by dividends reported as taxable income. However, Swedish listed firms substantially cut dividends from over USD 1.45 billion in 1991 to USD 0.61 billion in 1993 during the economic crisis. To control for changing payout policies on the stock market, Table A.3 of the Appendix presents difference-in-difference estimates in reported dividends for the 1991 reform as well as the 1994 tax cut. I define the treatment group as individuals in the top decile who realized capital gains in 1991 (and 1994 respectively) but who did not realize capital gains in the two years preceding the tax cut. The control group consists of individuals who did not realize capital gains either in the year of the tax cut or the two preceding years. There is weak evidence that individuals realizing capital gains receive less dividends

¹³Between 1998 and 2000 the stock market index increased annually by 14.35% to 38.98%. During the 2001 crisis, the stock market index fell in 2001, 2002 and 2003 by -37.65%, -28.34%, and -14.16%.

after the respective tax cut. However, the results for the difference-in-difference estimate are insignificant for both, the 1991 and the 1994 tax cut.¹⁴ This is consistent with the prediction that individuals sell shares at the lower (temporary) capital gains tax rate and reinvest the free cash flow in stocks.

4.2 Effects on Life Cycle

Having established the result that there is a positive relationship between income and the reaction to the 1991 tax reform, I turn to important tests on the timing of capital gains over the life-cycle under different tax regimes. A simple life-cycle model of consumption and savings (see, for instance, Attanasio and Browning (1995), Carroll (1997), Gourinchas and Parker (2002), Gomes and Michaelides (2005) and Browning and Lusardi (1996) and Attanasio and Weber (2010) for literature overviews) integrates three different motives that have been empirically identified. First, younger individuals buffer stocks for precautionary reasons in the presence of undiversifiable labor income risk (Carroll, 1997). Second, individuals save for their retirement to maintain their working-life labor income. Third, individuals dissave when they are old. But, the bequest motive leads to some saving during the retirement. Figure 7 plots average labor income and the propensity to realize capital gains over the life-cycle for the top percentile, the top decile and all individuals.

Figure 7: Labor Income and Capital Gains Realizations in the Life Cycle

This Figure plots labor income (Panel A) and capital gains realizations (Panel B) for different age groups and income percentiles for the 1973-1996 sample. The sample consists of 5,292,383 observations and 309,486 individuals.

¹⁴Around both tax cuts, individuals with capital gains significantly receive more dividends than individuals without capital gains. To control for this effect in the difference-in-difference estimates, I restrict the sample to individuals in the top decile of the income distribution and include controls for income, wealth, and demographic factors.

As expected, labor income is hump shaped for all income classes. For the top decile of the income distribution, one can identify the three above mentioned motives in capital gains realizations for different age cohorts. First, young individuals (< 30 years) buffer stock and the fraction of young individuals with capital gains is relatively low. Second, individuals between 30 and 60 years have constant likelihood to realize capital gains. Finally, capital gains realizations significantly increase during the retirement. The pattern is almost similar for the top percentile except for the youngest individuals who already dissave to some extent. According to Carroll (1997), young, wealthy individuals with income above their target will already dissave while others buffer stock.

This life-cycle model is additionally influenced by capital gains taxation. When capital gains are taxed at progressive rates, capital gains are temporarily locked-in in years with high marginal tax rates. Individuals have an incentive to postpone capital gains until years where they face lower marginal tax rates.¹⁵ In contrast, if capital gains are taxed at a proportional rate, tax incentives reduce to the benefits of a lower present value of discounted capital gains taxes. Figure 8 compares the pre- and postreform capital gains realization activity for different age cohorts. I restrict the sample to the top decile and top percentile respectively to ensure a more homogeneous sample and to include only tax-sensitive individuals. Panel A of Figure 8 illustrates the fraction of individuals with capital gains for the top percentile (black lines) and the top decile (gray lines) under a progressive tax system (dotted lines) and a proportional tax (solid lines).

All age cohorts significantly react to the reform. However, as illustrated in Panel B of Figure 8 the difference between post- and prereform realization activity decreases in age. A linear regression of the difference between pre- and postreform capital gains realizations on age yields a point estimate of -0.33 with a t-stat of -4.60 for the top percentile. This effect is smaller but still significant for the top decile with a coefficient of -0.05 and a t-stat of -2.05. It appears that the flat capital gains tax encourages younger individuals to realize capital gains. As the precautionary saving motive for young individuals should be more pronounced during an economic crisis, the true effect may be even underestimated.

¹⁵Auten and Joulfaian (2001) show that apart from income tax on realized capital gains, individuals capital gains realizations are driven by bequest taxes at death.

Figure 8: Capital Gains Realizations among Age Groups and the Tax Reform

This Figure depicts capital gains realization among age groups around the 1991 Tax Reform. Panel A illustrates the percentage of post- and prereform realizations in the top percentile (black lines) and the top decile (gray lines) of the income distribution. Panel B plots the difference between post- and prereform percentage of capital gains realization for the top percentile (solid gray line) and the top decile (dashed gray line) of the income distribution in 1985-1993. The black lines in Panel B are the fitted values of linear regression of the difference on age.

To address concerns that the results in Figure 8 are influenced by other confounding factors Table 5 presents results of detailed analyses of capital gains realizations before (column 1) and after (column 2) the reform as well as the difference (column 3) for different age cohorts in the top income percentile. Column 4 presents estimates for differences between post- and prereform realization activity with control variables (see Equation (1)). Panel A covers six years around the 1991 tax reform. Panel B covers the 1985-1996 period around the tax reform.

In both panels, the realization activity increases in age prior to the reform. 26% (23%) of all individuals aged 60 to 70 realize capital gains in the 1988-1990 (1985-1990) sample. The fraction is 5.4 (5.9) percentage points lower among the 30 to 40-year-olds. After the reform however, the difference between older and younger individuals diminishes. In Panel A, the youngest evaluated group shows the highest realization activity. In Panel B, the difference between the oldest and the youngest drops to 2.3 percentage points. Column four shows that results are very similar with control variables. The realization activity between older and younger individuals among the top percentile converges. In Panel A (Panel B), the difference between post- and prereform realization activity for the 30 to 40-year-olds amounts to 15.9 (23.3) percentage points – 9.2 (8.9) percentage points higher than for the 60 to 70-year-olds.

Table 6 presents the results from five different robustness tests for 1988-1993 and 1985-1996 period. In Column (1), the reaction of different age cohorts is estimated simul-

Table 5: Capital Gains Realizations Before and After the 1991 Reform in the Top Percentile – Breakdown by Age Groups

This table reports the average capital gain realizations, initiations, terminations and realized values prereform (column 1) and postreform (column 2), as well as estimates of the change between the two periods with (column 3) and without controls (column 4). Panel A covers six years around the 1991 tax reform (1988-1993). The sample consists of 234,406 individuals and 1,281,819 observations. Panel B covers the twelve-year period around the tax reform (1985-1996). The second sample consists of 258,382 individuals and 2,564,277 observations. Standard errors of the differences with and without controls (reported in parentheses) allow for heteroskedasticity and are clustered by county-years. ***, **, * indicate statistical significance of the difference at 1%, 5%, and 10% level, respectively.

Panel A: Top Percentile 1988-1993				
	Prereform 1988-1990 (1)	Postreform 1991-1993 (2)	Difference (post- minus prereform) (3)	Difference with controls (4)
Age 30 to 40 years (N=1,182)	21.002	38.366	17.364 (2.266)***	15.944 (2.586)***
Age 40 to 50 years (N=4,573)	20.285	36.305	16.020 (1.432)***	11.535 (1.742)***
Age 50 to 60 years (N=3,716)	22.950	37.755	14.805 (1.716)***	9.651 (1.669)***
Age 60 to 70 years (N=2,324)	26.430	37.436	11.006 (2.159)***	6.782 (2.191)***
Panel B: Top Percentile 1985-1996				
	Prereform 1985-1990 (1)	Postreform 1991-1996 (2)	Difference (post- minus prereform) (3)	Difference with controls (4)
Age 30 to 40 years (N=2,418)	16.375	47.240	30.865 (2.568)***	23.252 (2.574)***
Age 40 to 50 years (N=8,589)	18.190	44.010	25.820 (1.826)***	16.161 (1.494)***
Age 50 to 60 years (N=7,624)	19.691	49.354	29.663 (2.512)***	19.308 (2.098)***
Age 60 to 70 years (N=4,930)	23.267	49.587	26.320 (2.844)***	14.588 (2.296)***

Table 6: Capital Gains Realizations and Age Cohorts – Robustness Tests

This table presents estimates for differences in post- and prereform capital gain realization activity for the 1988-1993 sample (Panel A) and the 1985-1996 sample (Panel B) in different age cohorts. Columns (1) and (4) present results for the top percentile of the income distribution. Column (3) to (5) present estimates for the top decile. Columns (1) and (4) presents coefficient estimates for age specific differences from fixed-effect panel regressions including all individuals aged less than 70. In Column (2) and (5), observations from 1991 and 1994 have been excluded from the separately estimated age cohort effects. Column (3) replicates the differences with controls from Table 5 but uses the sample of individuals in the top decile. Standard errors of the differences with and without controls (reported in parentheses) allow for heteroskedasticity and are clustered by county-years. ***, **, * indicate statistical significance of the difference at 1%, 5%, and 10% level, respectively. All regressions include control variables as in equation (2)

Panel A: 1988-1993					
	Top Percentile			Top Decile	
	Joint Test	w/o 91/94	All	Joint Test	w/o 91/94
	(1)	(2)	(3)	(4)	(5)
Age	11.665	19.307	9.652	8.602	7.895
30 to 40	(3.142)***	(3.295)***	(0.723)***	(0.764)***	(0.920)***
Age	9.587	14.527	8.620	7.950	8.172
40 to 50	(1.430)***	(1.529)***	(0.573)***	(0.539)***	(0.903)***
Age	9.556	13.747	7.732	5.979	7.828
50 to 60	(1.724)***	(1.597)***	(0.615)***	(0.522)***	(0.867)***
Age	5.258	10.339	7.800	5.830	7.702
60 to 70	(2.093)**	(2.289)***	(0.738)***	(0.705)***	(0.947)***
Panel B: 1985-1996					
	Top Percentile			Top Decile	
	Joint Test	w/o 91/94	All	Joint Test	w/o 91/94
	(1)	(2)	(3)	(4)	(5)
Age	16.677	29.938	17.77	13.012	18.001
30 to 40	(3.009)***	(2.640)***	(1.467)5***	(1.363)***	(2.001)***
Age	15.836	23.279	16.384	12.360	16.480
40 to 50	(2.125)***	(1.886)***	(1.226)***	(1.208)***	(1.475)***
Age	18.348	28.391	19.514	12.052	19.744
50 to 60	(2.583)***	(2.916)***	(1.473)***	(1.421)***	(1.718)***
Age	12.874	24.104	19.881	12.543	19.957
60 to 70	(3.170)***	(2.762)***	(1.738)***	(1.614)***	(1.987)***

taneously and not separately as in Table 5. In Column (2), I address concerns that the reaction is a one-time effect in 1991 and 1994. Both tests yield the same pattern. Younger individuals respond more strongly to the reform than individuals who are retired or close to retirement. In Column (3) to (5), I repeat the baseline regressions from Column (4) in Table 5, the joint test and the test without 1991 and 1994 for the top decile of the income distribution. The results in Panel A indicate that among the top decile, younger individuals react more to the reform than older individuals. At the first glance, the results for the 1985-1996 period are contradictory but these tests only reflect *absolute* and not *relative* changes in realization behavior. Relative to their prereform level of capital gains realization behavior, the youngest show the strongest reaction to the 1991 tax reform.

This evidence suggests that proportional versus progressive taxation changes life-cycle savings behavior. A flat tax as opposed to a progressive tax effectively lowers tax costs of selling capital gains assets in years where precautionary or retirement savings motives dominate. The age of the average (high income) investor realizing capital gains is significantly lower when capital gains are taxed at proportional as opposed to progressive rates. Thus, it appears that there are structural differences on capital markets between tax regimes as for example risk-taking, diversification and trading activity significantly differs among age cohorts (see Calvet, Campbell, and Sodini, 2009a,b).

4.3 Capital Gains as Transitory Income Component

Finally, I examine the role of liquidity constraints at the individual level. If individuals face a temporary low income, they might realize accrued capital gains and smooth income to maintain their level of consumption. Apart from the incentive to overcome temporary liquidity constraints by selling capital gains assets, progressive taxation strengthens this tendency (see, for example, Auten and Clotfelter, 1982; Stiglitz, 1983). If the temporary tax rate is significantly lower than the average, permanent tax rate an investor can effectively lower his capital gains tax burden by realizing capital gains in years with liquidity constraints. In contrast, if an investor has a higher income than usual, he is less likely to realize capital gains as capital gains are additionally locked-in by the tax wedge between current and ordinary marginal tax rate. After the introduction of the proportional

capital gains tax, individuals with liquidity constraints have no tax incentive to realize capital gains. In contrast, individual with excess income are not additionally locked-in by temporary high tax rates.

If this prediction holds, I should be able to identify an effect of the 1991 Tax Reform on the relation between current income, average income and the likelihood to realize capital gains. Using the longitudinal character of LINDA, I am able to identify the effects of proportional versus progressive capital gains taxation on the realization behavior of individuals with liquidity constraints or excess income. I restrict this analysis to a more homogeneous sample of high income, tax-sensitive individuals in the top decile of the income distribution. I also analyze the sample of individuals in the top percentile.¹⁶ Next, I sort high income individuals into deciles of the difference of current income to the average income over three years (*Delta_Inc*).¹⁷ I define individuals in the bottom decile of the *Delta_Inc* distribution, i.e. those taxpayers with the lowest income relative to average income, as individuals with liquidity constraints. Taxpayers in the top decile of the *Delta_Inc* distribution are regarded as individuals with excess income. Individuals with temporary low income have an average income of SEK 303.137 (see Table A.5 in the Appendix). Current income is about 25% lower than average income over the preceding three years. Individuals with temporary high income have an average income of SEK 489.908. This is 26.59% higher than on average.¹⁸

Figure 9 plots capital gains realizations for individuals with temporary low income (black line) and temporary high income (gray line). Panel A (Panel B) presents results for the top decile (top percentile) of the income distribution. As expected, capital gains are locked-in when income tax rates are temporarily high. The percentage of individuals with temporary high income realizing capital gains is almost constant at a level of 8% for high incomes (Panel A) and 16% for top incomes (Panel B). In contrast, individuals with temporary low income are much more likely to realize capital gains in both panels. The

¹⁶Results and trends in capital gains realizations are very similar when analyzing the more heterogeneous sample of all taxpayers (see Figure A.3 and Table A.4 in the Appendix).

¹⁷As robustness checks, I tested different cutoffs (5%, 20%). Results (not reported) are very similar.

¹⁸For the top percentile, average income is significantly higher. On average income is SEK 549.853 (temporarily low income) and SEK 887.124 respectively (temporarily high income). For individuals with liquidity constraints (excess income), current income is about 28.63% (29.09%) lower (higher) than on average.

Figure 9: Capital Gains Realizations and Temporary Income Deviations

This Figure depicts the percentage of individuals realizing capital gains for individuals with temporary lower income (black line) and temporary higher income (gray line) in the top decile (Panel A) and the top percentile (Panel B) of the income distribution in 1983-1996. The sample contains the 10% largest negative and 10% largest positive income deviations from the three year average. The vertical line separates years 1990 and 1991 in each year.

fraction of individuals with capital gains amounts to 29.7% for the top decile and to 40.6% for the top percentile. After the reform, this relation changes substantially. Individuals with temporary high income significantly increased capital gains realizations as they are not additionally locked-in by temporary high tax rates under the proportional tax scheme. In contrast, individuals with lower current income cut capital gains realizations. Table 7 presents difference estimates between both groups and periods where I additionally control for income, wealth and demographic factors as in equation (1).

Prior to the reform, the difference with controls between individuals with temporary low and high income amounts to -22.62 percentage points – 140% the unconditional mean of prereform realization activity of individuals with high temporary income. This difference is even stronger for the top decile of the income distribution – more than three times the prereform average of 8%. One reason for the stronger effect in the top decile is the progressive tax scheme. Individuals in the top decile are more likely to face kinks in the tax code than taxpayer in the top percentile.

The differences between pre- and postreform period are negative for individuals with temporary low income and positive for individuals with excess income. The estimated magnitudes are large. The likelihood that individuals with excess income in Panel B (Panel A) realize capital gains surges by 34.86 (35.59) percentage points – more than 430% (220%) of the unconditional prereform average. The effects for individuals with liquidity constraints are substantially smaller. The probability that individuals in Panel

Table 7: Income Deviation and the Reaction to the 1991 Tax Reform

This table reports the average capital gain realizations for bottom (column 1) and top (column 2) decile of the income deviation distribution, as well as estimates of the change between the two periods with (column 3) and without controls (column 4). Panel A consists of 9,104 observations of individuals in the top percentile of the income distribution. Panel B consists of 50,804 observations. Standard errors (reported in parentheses) allow for heteroskedasticity and are clustered by county-years. ***, **, * indicate statistical significance of differences at 1%, 5%, and 10% level, respectively. (2)

Panel A: Top Percentile of Income Distribution				
	Temporary Low Income (1)	Temporary High Income (2)	Difference between Groups (3)	Difference with Controls (4)
Prereform 1988-1990	40.622 (1.144)***	16.154 (0.836)***	-24.468 (1.190)***	-22.623 (1.238)***
Postreform 1991-1993	35.394 (1.383)***	52.541 (0.999)***	17.146 (1.826)***	18.717 (1.864)***
Difference between Periods	-5.228 (1.788)***	36.387 (1.302)***	41.614 (2.171)***	
Difference with Controls	-5.257 (1.692)***	35.594 (1.267)***		40.665 (2.133)***
Panel B: Top Decile of Income Distribution				
	Temporary Low Income (1)	Temporary High Income (2)	Difference between Groups (3)	Difference with Controls (4)
Prereform 1988-1990	29.677 (0.786)***	8.058 (0.312)***	-21.619 (0.756)***	-25.301 (2.592)***
Postreform 1991-1993	21.186 (0.891)***	42.018 (1.245)***	20.832 (1.735)***	13.496 (2.369)***
Difference between Periods	-8.491 (1.184)***	33.960 (1.284)***	42.451 (1.885)***	
Difference with Controls	-7.807 (1.127)***	34.860 (1.178)***		41.542 (1.767)***

A (Panel B) with temporary low income realize capital gains decreases by 5.26 (7.81) percentage points or 13% (26%) of the unconditional prereform average. The result may be driven by the relative importance of liquidity constraints to tax benefits under the progressive capital gains tax. Finally, the estimated differences in the likelihood to realize capital gains between individuals with excess income and taxpayers with temporary low income in Panel A (Panel B) increase from -22.62 to 18.72 (-25.30 to 13.50) percentage points after the introduction of the proportional capital gains taxation.

These results suggest that tax regimes drive the motivation behind capital market transactions. Under progressive taxation, private investors appear to predominantly realize capital gains for liquidity reasons. After the reform, capital gains realizations are

less driven by individual liquidity constraints. In fact, individuals with excess income realize capital gains more actively than individuals with liquidity constraints under proportional taxation. As individuals with liquidity constraints are expected to set different ask prices than individuals without constraints, progressive versus proportional capital gains taxation substantially affects capital markets and asset prices.

5 Conclusion

This paper has shown that progressive versus proportional taxation affects capital gains realization behavior. Using a comprehensive panel data set from 1973-1996 I show that: 1) the likelihood to realize capital gains increases after the introduction of the proportional tax, 2) the reaction to the reform is more pronounced among high-income individuals, and 3) the motive behind capital gains realizations differs between progressive and proportional taxation. Older individuals as well as investors with liquidity constraints are more likely to realize capital gains than younger investors and individuals with excess income respectively when capital gains are taxed at progressive rates. Under proportional taxation, realization behavior of different age cohorts converges and individuals with excess income substantially increase capital gains realizations.

The results also have broader implications for our understanding of capital gains tax regimes. First, the transition of progressive to proportional capital gains taxation drives the distribution of realized capital gains across individuals. Second, capital gains tax regimes affect the motive behind capital gains realizations. For example, younger investors as well individuals without liquidity constraints may rebalance portfolios more actively under proportional taxation than under progressive tax rates. This means that tax regimes also change the risky share and diversification of individual portfolios. Thus, capital gains tax policy offers one important potential channel for affecting the average private investor participating in capital markets, the distribution of realized capital gains across individuals and individual saving decisions over the life-cycle.

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Appendix

Figure A.1: Average Portfolio Composition 1989-1990

This Figure plots the average portfolio composition (shares and funds, cash holdings and real estate wealth) for individuals in different deciles of the income distribution. Statistics are based on 19,708 individuals in 1989 and 1990 using the HINK data set. (1).

Figure A.2: Difference in Capital Gains Realizations by Income Percentile 1998-2003

This Figure depicts the average increase in the percentage of individuals realizing capital gains in each income percentile. The difference between crisis (2001-2003) and pre-crisis (1998-2000) realization activity is estimated separately for each percentile of the income distribution. The estimated model is defined as in equation (1).

Figure A.3: Capital Gains Realizations and Temporary Income Deviations – All Individuals

This Figure depicts the percentage of individuals realizing capital gains for individuals with temporary lower income (black line) and temporary higher income (gray line) for all individuals in 1983-1996. The sample contains the 10% largest negative and 10% largest positive income deviations from the three year average in each year.

Table A.1: Income and the Reaction to the 1991 Tax Reform - Robustness Tests 1988-1993

This table presents coefficient estimates for differences in post- and prereform capital gain realizations for the 1988-1993 sample. The first group accumulates the lowest five deciles (P0-P50). The next groups refer to the sixth to ninth decile of the income distribution. The sixth group consists of the 91st to 99th percentile. Finally, the last group consists of individuals in the top percentile. β_i is the coefficient estimate for the post-reform effect in group i . In Column (1), observations from 1991 and 1994 have been excluded from the regressions. In Column (2), the sample is restricted to individuals with constant income. Observations where income changes by more than 15% are excluded. Column (3) combines restrictions from Column (1) and (2). Results in Column (4) are based on the sample of individuals with constant income, excluding the years 1991 and 1994, and all individuals younger than 30 or older than 60. Column (5) includes control variables for relevance of interest deduction. In Column (6), the sample is restricted to Swedish regions of Småland and the Islands and Northern Central Sweden where the house price index is least volatile. Standard errors (reported in parentheses) allow for heteroskedasticity and are clustered by county-years.

	Without 91/94	Constant Income	Const. Inc. w/o 91/94	Const. Inc. w/o 91/94 30≤age≤60	Control for Interest Deduction	Regions with least volatility
	(1)	(2)	(3)	(4)	(5)	(6)
β_1	1.704 (0.127)	0.685 (0.076)	0.907 (0.113)	1.955 (0.183)	1.543 (0.098)	1.374 (0.137)
β_2	2.658 (0.212)	1.594 (0.142)	1.960 (0.219)	2.557 (0.258)	2.672 (0.196)	2.415 (0.271)
β_3	3.224 (0.238)	1.949 (0.217)	2.585 (0.262)	3.048 (0.308)	3.094 (0.188)	3.026 (0.325)
β_4	4.221 (0.223)	2.881 (0.247)	3.266 (0.350)	3.620 (0.388)	4.108 (0.225)	4.006 (0.440)
β_5	5.486 (0.319)	3.804 (0.333)	4.384 (0.491)	4.818 (0.522)	5.468 (0.308)	5.363 (0.415)
β_6	9.136 (0.456)	5.110 (0.581)	6.247 (0.747)	6.887 (0.775)	8.412 (0.475)	7.404 (0.595)
β_7	16.955 (0.992)	7.330 (1.311)	9.096 (1.701)	11.232 (1.400)	15.34 (0.952)	14.444 (2.255)
NOBS	680,953	912,621	761,929	397,304	1,281,819	247,312
R ²	0.3974	0.4247	0.4472	0.4626	0.3791	0.3823

Table A.2: Income and the Reaction to the 1991 Tax Reform - Robustness Tests 1985-1996

This table presents coefficient estimates for differences in post- and prereform capital gain realizations for the 1985-1996 sample. The first group accumulates the lowest five deciles (P0-P50). The next groups refer to the sixth to ninth decile of the income distribution. The sixth group consists of the 91st to 99th percentile. Finally, the last group consists of individuals in the top percentile. β_i is the coefficient estimate for the post-reform effect in group i . In Column (1), observations from 1991 and 1994 have been excluded from the regressions. In Column (2), the sample is restricted to individuals with constant income. Observations where income changes by more than 15% are excluded. Column (3) combines restrictions from Column (1) and (2). Results in Column (4) are based on the sample of individuals with constant income, excluding the years 1991 and 1994, and all individuals younger than 30 or older than 60. Column (5) includes control variables for relevance of interest deduction. In Column (6), the sample is restricted to Swedish regions of Småland and the Islands and Northern Central Sweden where the house price index is least volatile. Standard errors (reported in parentheses) allow for heteroskedasticity and are clustered by county-years.

	Without 91/94	Constant Income	Const. Inc. w/o 91/94	Const. Inc. w/o 91/94 30≤age≤60	Control for Interest Deduction	Regions with least volatility
	(1)	(2)	(3)	(4)	(5)	(6)
β_1	4.066 (0.432)	2.576 (0.277)	2.867 (0.254)	4.402 (0.339)	3.438 (0.357)	3.686 (0.491)
β_2	5.794 (0.529)	4.611 (0.454)	5.164 (0.400)	5.951 (0.412)	5.417 (0.503)	5.757 (0.684)
β_3	6.62 (0.596)	5.605 (0.558)	6.171 (0.468)	6.507 (0.455)	6.359 (0.588)	7.325 (0.889)
β_4	8.088 (0.609)	6.977 (0.608)	7.523 (0.603)	7.777 (0.589)	7.755 (0.631)	8.279 (0.885)
β_5	10.569 (0.804)	9.252 (0.820)	9.455 (0.791)	9.621 (0.757)	10.233 (0.859)	11.746 (1.259)
β_6	15.766 (1.190)	12.812 (1.278)	12.533 (1.103)	12.602 (1.014)	14.756 (1.273)	16.172 (1.611)
β_7	24.359 (1.954)	17.663 (2.181)	16.688 (1.936)	17.979 (1.875)	21.816 (1.895)	24.875 (2.577)
NOBS	1,369,927	1,836,217	1,530,181	807,556	1,941,501	494,606
R ²	0.3032	0.309	0.3306	0.3565	0.3129	0.2845

Table A.3: Capital Gains Realizations and Windfall Gains

This table reports coefficient estimates for differences in dividend income around the 1991 tax cut (Panel A) and the 1994 tax cut (Panel B) between individuals without capital gains in 1989 to 1991 (1991-1993 for Panel B) and individuals with capital gains in 1991 (1994 for Panel B). The sample consists only of individuals in the top decile of the income distribution in the year of the tax cut. Differences with Control include income, wealth, income deviation and demographic variables as additional explanatory variables. Standard errors (reported in parentheses) allow for heteroskedasticity and are clustered by county-years. ***, **, * indicate statistical significance of differences at 1%, 5%, and 10% level, respectively. (2)

Panel A: 1991 Tax Cut				
	No Capital Gain 1989-91 (N=27,891)	Capital Gain in 1991 (N=6,183)	Difference between Groups	Difference with Controls
Pre Tax-Cut 1988-1990	1.348 (0.162)***	5.119 (0.710)***	3.771 (0.694)***	2.965 (0.833)***
Post Tax-Cut 1991-1993	1.674 (0.177)***	4.939 (0.830)***	3.265 (0.684)***	2.807 (0.639)***
Difference between Periods	0.326 (0.238)	-0.180 (1.092)	-0.506 (0.969)	
Difference with Controls	0.146 (0.317)	-1.447 (1.004)		-0.659 (0.875)
Panel B: 1994 Tax Cut				
	No Capital Gain 1992-94 (N=18,269)	Capital Gain in 1994 (N=7,902)	Difference between Groups	Difference with Controls
Pre Tax-Cut 1991-1993	2.072 (0.186)***	4.089 (0.208)***	2.017 (0.175)***	1.723 (0.183)***
Post Tax-Cut 1994-1996	2.008 (0.336)***	3.871 (0.482)***	1.863 (0.276)***	1.464 (0.231)***
Difference between Periods	-0.064 (0.383)	-0.219 (0.525)	-0.154 (0.325)	
Difference with Controls	-0.463 (0.286)	-1.12 (0.411)***		-0.272 (0.301)

Table A.4: Income Deviation and the Reaction to the 1991 Tax Reform – All Individuals

This table reports the average capital gain realizations for bottom (column 1) and top (column 2) decile of the income deviation distribution, as well as estimates of the change between the two periods with (column 3) and without controls (column 4). The sample consists of 122,782 observations. Standard errors (reported in parentheses) allow for heteroskedasticity and are clustered by county-years. ***, **, * indicate statistical significance of differences at 1%, 5%, and 10% level, respectively. (2)

	Temporary Low Income (1)	Temporary High Income (2)	Difference between Groups (3)	Difference with Controls (4)
Prereform 1988-1990	19.374	4.076	-15.298 (0.642)***	-11.822 (0.426)***
Postreform 1991-1993	12.610	21.662	9.052 (1.736)***	13.251 (1.370)***
Difference between Periods	-6.764 (0.935)***	17.586 (1.336)***	24.350 (1.843)***	
Difference with Controls	-8.515 (0.688)***	17.705 (1.124)***		23.477 (1.392)***

Table A.5: Descriptive Statistics of Individuals with Temporary Low and High Income

This table reports descriptive statistics on fraction of individuals with capital gains (CapGain), income and relative income deviation (Del/Avg.Inc) for individuals with temporary lower income (Panel A) and individuals with temporary higher income (Panel B). The sample is as described in Table 7.

Individuals with Temporary Lower Income						
	Top Decile			Top Percentile		
	Total	Pre	Post	Total	Pre	Post
CapGain	24.42%	29.68%	21.19%	37.00%	40.62%	35.39%
Income	303.137	297.987	306.735	549.853	525.477	568.987
Del/Avg.Inc	-25.36%	-25.43%	-25.31%	-28.63%	-27.96%	-29.16%
N	25,204	10,366	14,838	4,241	1,865	2,376
Individuals with Temporary Higher Income						
	Top Decile			Top Percentile		
	Total	Pre	Post	Total	Pre	Post
CapGain	26.36%	8.06%	42.02%	35.81	16.15%	52.54%
Income	489.908	416.982	550.956	887.124	678.448	1,050.593
Del/Avg.Inc	26.59%	21.72%	30.67%	29.09%	18.49%	37.39%
N	25,637	11,682	13,955	4,758	2,090	2,668

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