Ethnic and Racial Disparities in Saving Behavior

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Abstract

This study investigates one of the explanations for the ethnic and racial wealth gaps: whether households with the same income level present differences in saving rates. This question has not been directly addressed for Hispanics yet, only for African Americans. Using pre-retirement data from the Health and Retirement Study, I compute saving rates as the ratio of wealth change to income, and distinguish between new flows of money and capital gains. I find that Mexican as much as African Americans have lower saving rates than Whites, even after controlling for income and socio-demographic factors. Whereas these differences for Mexicans are due to lower flows of money into assets, they are explained by lower capital gains for Blacks. Finally, I explore the role that private transfers play in the accumulation of wealth across races and ethnicities. Exploiting the panel structure of the data, I estimate models for the decision to save, not on *realized* transfers, but on the *perceived probabilities* of giving/receiving financial help and an inheritance. I find that only the subjective expectations of leaving an inheritance affect savings negatively for both Mexican Americans and Whites, so it is unlikely that this accounts for the ethnic gap in wealth accumulation. I conclude that despite the strong networks that minorities form in their family and community, private transfers within that network do not seem to play a key role in explaining savings differences.

1 Introduction

Despite their demographic growth in the last decades, Hispanics [1] and Blacks living in the US are particularly disadvantaged with respect to Whites, not only in terms of income and labor market opportunities, but also in terms of wealth and readiness for retirement. After the financial crisis of 2007-2008, the wealth gap between minorities and Whites has climbed to a record level, reaching in 2009 the highest peak of the last 25 years at least.[2] Whereas the consequences of these disparities are well known, their causes and the instruments to reduce them still need to be better understood.

A natural explanation for wealth disparities across families are differences in income. However, a number of studies have shown that the Black-White gap persist even within groups with the same permanent income

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[1] In most US surveys Hispanics are considered as an ethnic group, which is a classification determined by culture or origin and independent of race. Hispanics self-identify mainly as white, mestizo or mulatto descendants, or black. However, most are viewed as of multi-racial origin in the US. In this study I will refer to 'non-Hispanic Whites' simply as 'Whites' and to 'non-Hispanic Blacks' as 'Blacks'.

[2] "Wealth Gaps Rise to Record Highs Between Whites, Blacks and Hispanics", Pew Research Center, July 2011.

level. This gave rise to a variety of explanations to account for wealth differences that cannot be explained solely by income (Blau & Graham 1990, Wolff 1992, Oliver & Shapiro 1995, Menchik & Jianakoplos 1997, Hurst et al. 1998, Barsky et al. 2002, Altonji & Doraszelski 2005). In the case of Hispanics, very few studies address the issue. Cobb-Clark & Hildebrand (2006) state that most of the ethnic wealth gap stems from differences in current income levels and background characteristics of households. However, there are reasons to suspect that Hispanics have different patterns of wealth accumulation than Whites, as the following quotation from *The Wall Street Journal* illustrates:

> Not only do many Latinos work in low-wage industries, but the idea of accumulating funds for one's elder years doesn't always mesh with a culture that emphasizes individuals taking care of one another. "Retirement is a foreign concept for many Hispanic workers," [...]. "The focus is on providing for the extended family, and they expect their family to take care of them when they're no longer working." ...Even at the highest income level counted in the Ariel/Hewitt survey—a salary of $120,000 or above—Hispanics had the least amount saved for retirement: an average of $150,000, compared with $155,000 for African-Americans, $161,000 for whites and $223,000 for Asians. (Pessin 2011).

According to the standard life-cycle model (Modigliani & Brumberg 1954), one important source of wealth inequality among households with the same level of income are differences in saving rates.[3] Different reasons were studied in the literature that explains why promoting savings among the poor is seen as a necessary and fruitful avenue. First, most of the benefits of traditional policies encouraging savings are captured by those with higher income. Second, this approach seems more promising for economic development and for fighting against poverty than approaches centered on income. Third, there are certain lumpy investments such as a house that contribute substantially to increase living standards, but are not affordable to poor people unless they can accumulate a considerable amount of wealth. Fourth, unexpected events such as a job loss or an illness require to have accumulated funds to cope with the temporary shock. Fifth, Social Security (S.S.) offers a higher replacement rate to low-income people and so they may not see the need to save individually for retirement, which leaves them more vulnerable if the generosity of public funds diminishes. Fifth, the habit of accumulating a fraction of personal income for the future may help to make people more forward-looking and to extend their planning horizon. The prevalence of this view has resulted in a shift in the focus of pro-poor policies from income, education and consumption to tackle directly savings and wealth accumulation.

Despite the evident importance of savings for wealth inequality, the subject has received little attention in the literature. Most existing studies focus on differences in wealth levels between African Americans and Whites. Less attention has been paid to the rate of wealth accumulation over time and to the comparison of Hispanics

[3]The other two main sources of inequality beyond income are: i) Inheritances or inter-generational transfers: They may affect relative wealth positions if Hispanics and Blacks inherit from their parents smaller amounts than Whites. However, Juster et al. (1999) dismiss the importance of bequests since very few American households have received financial inheritances. ii) Ex-post rates of return to capital: The fact that Hispanics and Blacks have a different portfolio composition than Whites (for example, they are much less likely to hold financial assets) can result in lower ex-post rates of return on their savings. This can also happen if there are differences in asset-specific rates of return, i.e. conditional on holding specific assets, minorities face systematically lower rates of return.

and Whites. With the purpose of dealing with these issues, the first goal of this study is to explore whether there are differences in the savings behavior of Hispanics and Blacks with respect to Whites that could lead to disparities in wealth.[4] In the light of that evidence, my ultimate goal will be to understand the factors that drive such behavior. Families with lower permanent income have lower saving rates (Dynan et al. 2004).[5] So the relevant question is: why could be saving rates lower for minority groups than for Whites, conditional on income and socio-demographic characteristics? The answer to this question needs to distinguish if savings differentials arise from active savings decisions made by households or from differences in the evolution of asset prices.

The hypothesis that I study here is whether lower savings may result from the fact that minorities, and Mexican Americans in particular, have more extensive family support networks. Strong support networks may reduce the need of precautionary saving for some individuals, and therefore result in lower accumulated wealth. Potential transfers to/from family and friends and expected inheritances can affect the individual accumulation of assets which takes place through an increase in labor supply or a reduction in consumption. Indeed, the low pension participation rates among Mexican Americans have been attributed to the expectation that when they get old they will receive support from their children and extended family members (Richman et al. 2012). Mexican immigrants send significant portions of their salary back to their home countries, which may crowd-out savings in the US. Remitting funds to help educate children, build homes, and invest in small business is a form of preserving and strengthening ties abroad[6], with the expectation of receiving family support in old age. In that case, remittances could be viewed as a rational strategy to prepare for retirement and lower savings in the US would not represent a suboptimal decision.

The contributions of this study are, first, to document the ethnic and racial differences in saving rates. In that sense, it is close to Gittleman & Wolff (2004) who compare the accumulation patterns of African Americans and Whites. But I extend their study by incorporating Mexican Americans and Other Hispanics into the analysis, by including data on S.S. and pensions (the larger component of total wealth that has an equalizing effect), and by looking at the evolution of savings for a different time period (especially likely to affect capital gains). Second, this study explores whether the strength of support networks may be affecting the differential saving patterns by looking at the role of perceived probabilities of transfers and inheritances. This approach, which has been advocated by Cox & Fafchamps (2008), has not been previously addressed to my knowledge since most of the data sets only measure actual transfers. McKernan et al. (2011), for example, answer a similar question but looking at the effect of actual rather than potential transfers. An advantage of the HRS that I can exploit for this purpose are its direct questions on subjective probabilities. The idea is that what matters for savings decisions are not realized transfers but the transfers that are expected between family and friends. This may

[4]For the purpose of this analysis, the sample of Hispanics will be split between Mexican Americans and Other Hispanics.

[5]In the simplest version of the life-cycle model savings are proportional to permanent income. However, saving rates are expected to differ with income in more extended versions of the model that introduce heterogeneity in time preference rates and in interest rates across households, and non-homothetic preferences.

[6]Amuedo-Dorantes (2006) in "Remittances and their microeconomic impacts: evidence from Latin America" finds that the percentage of Mexicans reporting that send money back home for asset accumulation purposes is higher than for migrants from other Latin American countries (48%), where it is more common to remit money for consumption purposes. However, the average dollar amount remitted home by Mexicans is equal to the average amount remitted home by all the immigrants.

have an effect on the precautionary savings of individuals that can rely on external financial help or that are likely to give that help in case that a particular need arises.

In order to document the differentials in savings rates, I use data from the HRS for the periods 1992-1998 and 1998-2004 and compute total saving rates as the change in wealth divided by income. The choice of years was based on the availability of S.S. and pension data, which allow me to compare savings rates with and without those assets. In addition, I distinguish between active savings (exclusive of capital gains) and passive savings (capital gains or savings due to the change in the price of the asset). By adopting a regression approach, I find that Mexican Americans have lower saving rates than Whites, even conditioning on income and socio-demographic factors. What is remarkable is that these differences can be attributed to the direct effects of accumulation decisions rather than to the effects of asset prices and capital gains. African Americans also present a gap in unconditional and conditional means and medians. But this is purely reflecting the effect of lower capital gains during the period considered for the analysis. Including S.S. and pensions, the gap in savings remains for Mexican American households, but disappears for Black households after controlling for income. I have not found significant differences in savings between Other Hispanics and Whites.[7]

The second part of this study evaluates the effect of family transfers and inheritances on the decision to save. This is done by estimating the effect of subjective probabilities of giving/receiving a transfer and leaving/receiving an inheritance on the decision to save or not rather than on the amount of savings. This requires to re-estimate the total saving rates for every wave from 1992 to 2008 (excluding S.S. and pensions), and transform it into an indicator for positive savings. Then I use panel data fixed-effects to see the impact of "potential" rather than "realized" transfers on savings decisions. The perceived probabilities of transfers may be endogenous, and so they are instrumented with the lagged subjective probabilities reported, the lagged decision to give/receive a transfer and household and children income. The results show no effect of financial help on savings, and the only evidence is for the perceived probability of leaving an inheritance, which is negatively correlated with savings.

2 Related Literature

The study of the differential in Hispanics and Whites' saving rates relates to the broad literature on racial and ethnic inequality. This literature has focused mainly on income; the bulk of studies on wealth differences are much more recent. Whereas income inequality is a good indicator of discrimination in the labor market, wealth inequality provides a more complete measure of the relative economic position of minority families. Moreover, the empirical evidence indicates that the racial gap in wealth is considerably larger than the gap in income. And among the studies on wealth, most of them seek to explain the gap in wealth levels; just a few look at the rate of wealth accumulation or savings rate. But only with cross-sectional analysis it is difficult to gain insight on the causes underlying racial inequalities. By looking at the dynamics of the wealth accumulation process it

[7]Something to consider is that the models of wealth accumulation suffer from higher measurement errors in the dependent variable and lower explanatory power (as measured by the adjusted R^2) than the models in wealth levels. This would require being more cautious in the interpretation of their results.

is possible to gain a deeper understanding of the reasons behind those wealth disparities.

Most of the initial literature on wealth inequality has focused on the factors that explain the gap between Black and Whites (see Terrell 1971, Sobol 1979, Blau & Graham 1990, Wolff 1992, Oliver & Shapiro 1995, Menchik & Jianakoplos 1997, Hurst et al. 1998).[8] In their seminal study, Blau & Graham (1990) conduct a means-coefficient analysis, also known as Blinder-Oaxaca decomposition, that breaks down the differences in wealth into two components: one explained by differences in household characteristics, such as income, and another that is unexplained. They find that income is the most important factor to explain wealth differentials. However, even after accounting for income and other socio-demographic factors, they find that a substantial portion of the gap remains unexplained. They attempt to resolve the puzzle by evaluating the arguments taken from the standard life cycle model (Modigliani & Brumberg 1954), which attributes the racial differences in wealth to: i) inheritances or inter-generational transfers, ii) rates of return, and iii) savings rates. They conclude that racial differences in inheritances are the most likely of the three to account for most of the wealth gap.

More recent studies, like Altonji & Doraszelski (2005) and Barsky et al. (2002), have risen concerns about the adequacy of the regression decomposition approach. Barsky et al. (2002) claim that such decompositions incorrectly assume linearity in the relation between wealth and income. Moreover, the estimates based on such functional form are used to extrapolate outside the range of the Black income distribution, which is shifted to the left relative to the White distribution. Thus, they propose a nonparametric method to perform the decomposition and find that two-thirds of the mean differences in wealth can be attributed to earnings. They do not consider other factors, but acknowledge that it is fruitful to explore racial differences in preferences for wealth accumulation as a possible cause of the wealth gap. In comparison with previous studies, Altonji & Doraszelski (2005) can explain a larger fraction of the racial disparity in wealth holdings with income and demographic variables, but only if they estimate the wealth model in a sample of Whites. If they use a sample of Blacks, then they can only explain a small portion. They suggest that this discrepancy in the sensitivity of wealth holdings to observable characteristics is as important as the differences in income and demographics to understand the racial wealth gap. They conclude that the discrepancy is not caused by extrapolation out of sample nor by differences in inter vivos transfers and inheritances, but instead they suspect that it is explained by differences in savings behavior. This could be the case since, for example, a smaller proportion of Blacks has access to financial institutions.

Despite the speculations that differences in wealth accumulation can contribute to the racial wealth gap, the topic has received little attention in the literature. One exception is Gittleman & Wolff (2004), the study more similar in its approach to this. They divide the change in the value of each asset into capital gains and gross savings, which are the additional funds invested in that asset. This measure of savings (gross savings minus inflows from inheritances) is closely related to what in the literature is referred as active savings.[9] A wealth

[8] For a survey of the literature on racial differences in wealth see Scholz & Levine (2003).

[9] They point out to difference between their measure of savings and the measure of active savings used by Hurst et al. (1998) and Juster et al. (1999) among others (including this study). First, Gittleman & Wolff (2004) do not attribute the entire change in net equity of the home (less the value of home improvements) to capital gains. Instead, they divide it into saving (the change in mortgage principal) and capital gains (the change in the value of the house). Second, for assets for which there are not specific questions about inflows, the active saving approach allocates the entire change in net value to saving. In contrast, Gittleman & Wolff (2004) allocates a fraction to capital gains by applying a rate of return.

accounting framework is built to decompose the changes in wealth into savings, capital gains and inheritances or transfers. They find that racial differences in savings rates are not significant after controlling for income, and that the rate of return to capital is not greater for Whites than for Blacks, although they acknowledge that the latter may be period-specific. In counterfactual experiments following Oaxaca & Ransom (1994), they compute the fraction of the wealth gap that will be reduced if Blacks and Whites had comparable levels of income, had equalized the unconditional saving rates, had similar portfolio composition, or had inherited similar amounts. Although the equalization of savings rates would have also increased the wealth ratio, it is remarkable that they did not find a racial difference in savings behavior after controlling for income.

By the mid-nineties, studies looking at Hispanic wealth were almost nonexistent. Some of the few recent works that focus on differences in wealth levels are Smith (1995), Even & Macpherson (2003) and Cobb-Clark & Hildebrand (2006). They reach to different conclusions about the extent to which observable characteristics are able to explain the ethnic wealth gap. In a multivariate model, Smith (1995) finds that income and, to a smaller extent, current health are important predictors of racial and ethnic wealth disparities. Even when a significant amount of the wealth differences can be explained by these and other variables emphasized in models of asset accumulation, the magnitudes of the differentials remain large. Then he includes pension and S.S. into his definition of wealth and finds that it has a big impact on reducing racial and ethnic disparities. This is not surprising, since private pensions and S.S. represent a big fraction of household wealth and S.S. has an equalizing effect, since it differs very little across race and ethnicity. However, he notes that racial and ethnic wealth disparities are still larger than what seems justified by differences in permanent income alone, and concludes that the puzzle of why income minorities save so little remains unresolved.

In contrast, Even & Macpherson (2003) and Cobb-Clark & Hildebrand (2006) arrive to the conclusion that most of the wealth ethnic gap stems from differences in current income levels and background characteristics of households, rather than on the way in which households have accumulated wealth in the past (conditional on their income and characteristics). Even & Macpherson (2003) briefly examine total wealth in multivariate analysis and find that differences in earnings, education and socio-demographic characteristics account for most of the racial and ethnic differences in wealth. This result holds independently of whether pension wealth is included or not in the measure of total wealth (although pension savings do not affect the wealth differentials at the mean, they do at the lower tail of the distribution since poorer households hold a larger fraction of wealth in pensions). Cobb-Clark & Hildebrand (2006) analyze the wealth gap using a semi-parametric decomposition and find that although income differences are important, the main factor explaining the inequality in wealth are demographic characteristics: Mexican American families have more children and heads that are younger. Low educational attainment explains part of the wealth gap, even after accounting for differences in income. Note that the results of these two studies contrast to the explanations given in the literature for the gap in wealth between Blacks and Whites that originates in the way in which –conditional on their characteristics- wealth is accumulated.

The ultimate question of whether Hispanics are under-saving for retirement relates to the sizable literature on the adequacy or optimality of wealth accumulation. A widespread approach followed, for example, by Hubbard

et al. (1995) and Engen et al. (1999) is to compare observed behavior against a standard that is obtained by simulating the expected distribution of wealth from the life cycle model. In the context of that model, where households are rational optimizers, differences in savings for retirement are attributed to differences in the rate of time preferences, risk aversion, health status, life expectancy, tastes for goods complementary with leisure, or Social Security replacement rates. Scholz et al. (2006) use an augmented version of the life cycle model and find that most HRS households are saving more than their optimal targets, suggesting that they are financially well-prepared for retirement. Others have assessed savings adequacy by comparing observed data to financial rules of thumb, for example, Kotlikoff et al. (1982) and Gustman & Steinmeier (1999). And Banks et al. (1998) and Bernheim et al. (2001) make inferences about the adequacy of retirement savings by looking at consumption changes before and after retirement. Bernheim et al. (2001) conclude that their findings are compatible with behavioral theories of wealth accumulation that attribute the differences in wealth accumulation across households to 'rule of thumb', 'mental accounting', or 'hyperbolic discounting'.

Finally, this paper also relates to a growing literature that explores different hypotheses on the differences on savings and wealth levels across households. Some of these hypotheses attribute differentials in savings and/or wealth to lifetime income (Dynan et al. 2004), information and learning costs (Lusardi 2005), immigration condition (Paulson & Singer 2002, Osili & Paulson 2009), cultural effects (Carroll et al. 1994, 1999), and family size (Banerjee et al. 2010). Dynan et al. (2004) find that high-lifetime income households save a larger fraction of their income than those who have low-lifetime income. There are psychological and sociological theories that are consistent with the idea that low-income households save less because they are more impatient, have a higher SS replacement rate, and have less access to saving vehicles such as private pension plans. They are also more affected by asset-based, means-tested social insurance programs, which in turn may be distorting their saving rates. In addition, high information and learning costs can prevent wealth accumulation among minorities.

The hypothesis of cultural effects as an explanation for saving differentials has been proposed by Bosworth (1993) with the purpose to account for the remarkable differences in savings across countries. The hypothesis that people from different nationalities have different tastes for savings has been tested by Carroll et al. (1994, 1999) but has not receive empirical support either. Carroll et al. (1994) compares saving patterns of immigrants to Canada from countries with different saving rates. They find that savings do not vary significantly by place of origin of the immigrant. Independently of their origin, recent immigrants save less than Canadian-born people, but with time this difference diminishes. Carroll et al. (1999) answer the same question using data for the United States, but they do find significant differences on savings across country of origin. In particular, and consistent with the results found here for Mexican Americans, immigrants from Mexico and Cuba had the lowest saving rates (along with those from the Philippines and Taiwan). But the immigrants' saving patterns do not reflect those observed in aggregate data, i.e. immigrants from countries with high saving rates (such as Japan, Korea, Taiwan) do not necessarily save more. Thus, they conclude that cultural differences may not be explaining the differences observed in aggregate data.

Another approach to test the hypothesis on cultural differences is by looking at differences in family support networks across races and ethnicities, assuming that family support indeed affects savings behavior. In particu-

lar, the importance of children and family size in savings decisions has received attention as one explanation for the fertility transition in the ninetieth and early twentieth century, the process by which Europe and US went from high to low fertility. The argument is that children are a form of life-cycle savings, where parents invest on them when they are young and expect to obtain return to child-rearing when they are old (Guinnane 2011). Children became a less desirable form of savings as a result of the industrialization (the migration from rural areas to cities resulted in 'child default' to their implicit agreement with their parents) and of the introduction of the social insurance system as means of support in old age (Carter et al. 2004). Also, the demographics changes in China have converted the country in a unique laboratory to study that hypothesis (Wei & Zhang 2009, Banerjee et al. 2010). Banerjee et al. (2010) note that in China parents depend on children support as they age, and this dependance is higher from sons than from daughters. They exploit the decline in fertility from the early 70s caused by family planning programs and corroborates that, as the life-cycle model would predict, it causes a big increase in household savings driven by parents that have a daughter as a first child. Beyond those studies looking at the effects of family size, the effects of family support itself in savings behavior have been recently addressed by McKernan et al. (2011). They find that only large gifts and inheritances matter to explain the Black-White gap in wealth levels, but there is no role for private transfers in the form of financial help.

Finally, note that the explanations for differential saving rates across races can also be viewed through the 'chance' versus 'choice' framework proposed by Venti & Wise (1998). Their purpose is to understand how much of that wealth dispersion can be attributed to 'chance' events, such as inheritances, poor health or other shocks to wealth, and how much to the conscious 'choice' of saving out of available resources. In that context, Gustman & Steinmeier (2004) estimate a joint structural model of retirement and wealth for groups defined by race, ethnicity, gender and marital status. They decompose differences in outcomes into those due to differences in parameters of the preference function and those due to differences in the circumstances (the opportunity set and factors determining the disutility of work such as health status). What explains the differences in outcomes among White, Black and Hispanic males are differences in time preferences and in circumstances rather than preferences for leisure and consumption.

3 Data

In this study I will use data from the Health and Retirement Study (HRS). This choice is based on the consideration of several advantages that the HRS has over other household surveys collecting wealth data. First, it provides assets and income data of high quality, with a relatively low rate of item non-response and abnormally high retention rates compared to other aging studies (Banks et al. 2010). In particular, it provides the best household survey data available to calculate pension wealth. Since pension wealth is typically the largest asset on the household balance sheet, its importance for the study of savings is paramount. Second, the HRS oversamples Blacks and Hispanics at the rate 2:1 relative to Whites, which is extremely helpful for this

analysis on racial and ethnic differences.[10] Third, this data set collects information on households with at least one individual over 50 years old, which allows focusing on savings adequacy for retirement. In fact, the HRS is not appropriate to study savings for the entire age distribution. But the sample selected is the most adequate for this study because as people get older and approach retirement, they hold more types of assets, own more wealth and save faster.

Despite these benefits, some data quality issues need to be mentioned (Smith 1995, Venti & Wise 1998). First, the quality of data on assets and income is lower when they are used in their longitudinal dimension. Indeed, misreporting of asset balances and the imputation procedures implemented imply that the use of successive waves of wealth can confound some analyzes. Venti & Wise (1998) points out that "these potential misreports create 'spurious' wave-to-wave changes in assets that are common and typically much larger than 'legitimate' wave-to-wave changes.". Moreover, there is evidence that missing data is not random because those more reluctant to report are wealthier households (Smith 1995, Banks et al. 2010). In terms of imputation, the HRS has benefited from the use of bracket questions that allow determining a range in which the values lie and mitigates the problem of random non-response. However, the imputations of missing values do not rely on cross-wave information; they only use information from the wave corresponding to the missing data. The absence of longitudinal imputations also distorts wave-to-wave changes.

Second, Venti & Wise (1998) notes that, even when pension data in the HRS is by far the better collected to date in a survey; still it suffers from serious measurement errors. These are due mainly to the lack of knowledge of the respondents about the characteristics of their pension plans. For example, they have trouble classifying their pension plan as defined-benefit (DB) or defined-contribution (DC). And if they classify their DC pension plan as DB, then the corresponding balance is zero for that wave. Third, as in most household surveys, the wealth of very rich families is not accurately captured. It is hard to define the sample frame, and even when families are interviewed, it could be that they are reluctant to report very large amounts of stock holdings. Also, it is particularly hard to calculate the net value of certain assets with complex financial structures, such as business, where the complexity increases with the value of the asset. Unless special sampling frames are designed to represent high-wealth households, as in the Survey of Consumer Finances (SCF), the full range of the wealth distribution is not readily captured.

In the light of these issues, income and wealth data are taken from the RAND HRS 2008 Income and Wealth Imputations[11] that deals with missing values by imputing separately each income and wealth component. Unlike the HRS public release files, the RAND files use an imputation method that is consistent across all waves. In addition, I follow Smith's (1995) advice and restrict the analysis to total wealth and a few aggregate wealth components. He concludes that the more disaggregated the asset, the more cautious a researcher should be when using the HRS or any household survey. In addition, to deal with the measurement errors, I trim the sample by excluding households with wealth levels and saving rates at the top and bottom 2 per cent of the

[10] Residents of the State of Florida were the other group oversampled, because it is an area with high density and number of older populations.

[11] March 2011. See at: http://hrsonline.isr.umich.edu/index.php?p=avail.

distribution.[12] In this way, I not only get rid of the outliers originated in measurement errors, but also I exclude the extremely wealthy from the analysis, whose savings behavior is more difficult to model.

The measure of net worth used here includes: i) Real assets: Main home equity, real estate other than home equity, vehicles and business, and ii) Financial assets: Individual Retirement Accounts (IRAs), stocks, mutual funds, checking and savings accounts, CDs, savings bonds, treasury bills, bonds, and other assets (money owed by others, valuable collections, rights in a trust or estate) less other debts (credit card balances, medical debts, life insurance policy loans, loans from relatives). Note that this measure excludes private pension wealth, social security wealth, and future earnings. Thus, to account for the latter I use a set of cross-wave data constructed with information derived from the HRS: the Prospective Social Security Wealth Measures of Pre-Retirees[13], the Imputations for Pension Wealth 1992 and 1998[14], and the Imputations for Employer-Sponsored Pension Wealth from Current Jobs in 2004.[15]

The measure of income corresponds to the last calendar year and is the sum of respondent and spouse earnings, pensions and annuities, Supplemental Security Income and Social Security disability, Social Security retirement, unemployment and workers compensation and other government transfers, household capital income, and other income and lump sums from insurance, pension, and inheritance. To compute saving rates including S.S. and pensions, it is necessary to adjust the measure of total income and account for employer contributions. Thus, I adjust total household income by adding the fraction of the respondent and spouse earnings that correspond to employer contributions to DB and DC plans and to S.S.. This is measured as the cost to employers for DB and DC plans and for S.S. as percentages of total compensation. The data is taken from the Employer Costs for Employee Compensation (ECEC), produced by the Bureau of Labor Statistics.

I use household weights for descriptive statistics but not in the regressions. The use of sample weights in regression analysis is typically required when there is endogenous stratification. In that case, the survey over-samples a particular population and the oversampling criteria are related to the dependent variable, so the usual estimators are inconsistent if weights are not used.[16] For this study there is purely exogenous stratification because the HRS stratifies on the regressors only (i.e. race and ethnicity) and not on the savings rate, and so the usual estimators are still consistent even if the HRS were indirectly oversampling people with low savings. Still under exogenous stratification one may use weights for a descriptive approach, where the estimated relations do not necessarily imply causality and attempt to describe characteristics of the whole population and not of a particular sample. But if one takes a structural or analytical approach, then there is no need to use sample weights.[17]

The sample used for this study is restricted to sub-households with the same head and spouse over the relevant period (1992-1998 or 1998-2004), a common requirement adopted in the literature. By restricting the

[12] This procedure has been applied by Gittleman & Wolff (2004) to the PSID data.

[13] The version 4.0 of the data was prepared by Kandice Kapinos with Charlie Brown, Michael Nolte, Helena Stolyarova, and David Weir. Survey Research Center, Institute for Social Research, University of Michigan, November 2010. See at: http://hrsonline.isr.umich.edu/index.php?p=avail.

[14] Final version 2.0, December 2006. See at: http://hrsonline.isr.umich.edu/index.php?p=avail.

[15] Version 1, July 2009. See at: http://hrsonline.isr.umich.edu/index.php?p=avail.

[16] Hill (1992) explains this in the context of the PSID, which over-samples low-income households. Thus, in that case, the regressions that use income as the dependent variable need to be weighted.

[17] Cameron & Trivedi (2005) gives a good insight into this issue.

sample to stable households, one can ensure that wealth changes are not mainly explained by changes in family composition. I also drop observations for sub-households that were in the sample but were not interviewed in a particular wave, and for those that have either income or wealth missing. Then I drop households where the head was below 50 or above 70 years old in 1998 and in 2004 and where the head reports to be retired, where retirement status is defined through self-reports. Also, I exclude households where the spouses are of a different race or ethnicity.

3.1 Saving rates

The saving rate is defined as the ratio between savings and the income earned during the relevant period. The conceptually most appropriate measure of savings is the one obtained as the difference between disposable personal income and consumer expenditures, where both measures are obtained directly. By defining real income for household i as the sum of the return on non-human wealth between $s-1$ and s ($r_{is-1}W_{is-1}$), after-tax earnings (E_{is}), and transfers from the government (TR_{is}), household savings can be expressed as:

$$Y_{is} - C_{is} = r_{is-1}W_{is-1} + E_{is} + TR_{is} - C_{is} \tag{1}$$

where C_{is} is total consumption and r_{is-1} is the real after-tax rate of return on non-human wealth between $s-1$ and s.

However, there are practical difficulties to implement such approach using survey data. In particular, measuring consumption is a very time-consuming process and so it is not typically available in most surveys. The approach that I will follow here is the one feasible with HRS data and the most commonly adopted in the empirical literature.[18] This consists on computing savings as the difference in net worth between two time periods ($W_{is} - W_{is-1}$), which is referred as realized savings. Thus, it is straightforward to show the equivalence of the two definitions of savings if wealth at the end of period s is defined as:

$$W_{is} = W_{is-1}(1 + r_{is-1}) + TR_{is} + E_{is} - C_{is} \tag{2}$$

where $W_{is-1}(1 + r_{is-1})$ is net worth (exclusive of human wealth) at the beginning of period s. The equivalence is verified since capital gains are added to income to the extent that they are included in r. The main disadvantage of this approach is that, as it was explained before, the first difference of wealth will inherit, and most likely exacerbate, the measurement error that may be already present in the measured net wealth. And if measurement error is not perfectly correlated across survey waves, changes in wealth will carry significant amounts of measurement error.

In addition, the HRS allows distinguishing the change in the value of an asset due to: i) 'active savings', or current income that households do not spend but save, and ii) 'passive savings', reflecting the change in the price of the asset or capital gains that household do not realize and spend. The survey contains specific questions about active savings precisely for those components were capital gains are more important, such as housing,

[18] See Juster et al. (1999) for a detailed description of these approaches.

investment in real estate other than the primary residence, business, IRAs, and stocks. For those assets, capital gains are obtained as a residual –it is the difference between realized and active savings. In the particular case of housing, active saving is computed as in Juster et al. (2005). For households living in the same house between two waves, it equals the cost of home improvements plus the change in the mortgage and other home loans if a family owned a house, and zero otherwise. When a family moves, active saving in housing is computed as the change in home equity. This implies that when a family does not move the change in house value is imputed to capital gains. And for families that move between surveys all saving in housing -including the change in house value- is imputed to active saving.

In addition, note that since both realized and active savings are measured with error, the problem of measurement error becomes even bigger for capital gains, which renders more difficult the estimation of behavioral functions. Finally, these measures of savings needs to account for net transfers into the households, such as inheritances and gifts from family and friends, and changes in assets resulting from household members moving out or into the family. Since the form of these transfers and changes in assets resulting from changes in family composition is not known, it is not possible to allocate them to particular assets nor to decompose them between active savings and capital gains. Thus, the net transfers can only be considered when computing aggregate savings.

Why is it important to distinguish between realized and active savings? Hurst et al. (1998) explain that in the past the distinction between realized and active savings was not of major importance because the lack of heterogeneity in savings patterns and the little variability of returns across the population. Since the 1980s a new view of savings has emerged which acknowledges the existence of liquidity restrictions, the importance of heterogeneity in savings rates across households, and the dispersion of the ex-post rates of returns. These factors would contribute to wealth dispersion beyond what is explained by income dispersion. Recent studies have shown evidence that realized savings –i.e. changes in household wealth-, can differ sharply from active savings, which exclude capital gains. Eventually, the choice of the most relevant concept of savings depends on the question of interest. Active savings is more appropriate to analyze the supply of loanable funds for new investment and therefore is useful to study the effect of a redistribution of income on economic growth (Dynan et al. 2004). On the other hand, a measure of total savings that includes capital gains is the more appropriate concept to study the ex-post adequacy of saving for retirement. This is why I will focus in this second measure when I explore the relations between savings and family transfers.

4 Ethnic Differences in Saving Rates

4.1 Descriptive Analysis

There is a wide gap in wealth levels between Hispanics and Whites, similar to the gap between African Americans and Whites. This can be seen in Figure 1, where I plot the cumulative distribution of net wealth for each group, distinguishing between Mexican Americans and the rest of Hispanics. The figure shows that the three minority

groups present a cumulative distribution of wealth that looks much more similar than the one corresponding to Whites. It shows that the median wealth of Mexican Americans of $200 thousand corresponds to the 20th percentile of the White distribution for 2004. Similarly, the median wealth of Other Hispanics ($163 thousand) corresponds with approximately the 16th percentile of the White distribution.

Before looking at the patterns of wealth changes, it is useful to have a snapshot of the wealth distribution by household characteristics at one point in time. In Table 1 I present summary statistics for both mean and median because of the extreme positive distribution of wealth. Including S.S. and pensions, Mexican Americans have around half the wealth of Whites, both in terms of mean ($352 vs. $703 thousand) and in terms of median ($243 vs. $569 thousand). A similar gap in means is observed among Other Hispanics (their mean and median are $398 and $199 thousand respectively). Without retirement assets, the gap widens for Mexican Americans and their wealth represents only 38% of the White mean and 26% of the median. For Other Hispanics, the median gap becomes strikingly higher than the mean (8 vs. 63%) reflecting the extreme positive distribution of wealth for this group when the equalizing effect of S.S. is not accounted for.

As expected, mean and median wealth levels across groups are monotonically increasing with income.[19]Notice that the Mexican American wealth gap in means narrows at intermediate income levels, but still it remains at around 50% at the top and bottom of the income distribution. The gap in medians disappears at the first and third income quartile, but it remains at the second and fourth. Some of this abrupt changes may be explained by the small sample size, but still the evidence is consistent with wealth differences at the same income level. Thus, not all the gap can be attributed to the fact that there is a small portion of Mexican Americans relative to Whites in the higher income groups. Among Other Hispanics, there is a substantial gap with Whites in mean and median wealth levels at the lowest income quartile. And there is a jump in their wealth level at the 75th percentile of income so that they are the more wealthy at higher income levels (their mean wealth is $1,225 thousand, whereas the White wealth is $617 thousand). The Black gap presents less volatility across income quartiles, possibly due to the higher sample size. It widens at the lowest quantile (in means and medians) and at the highest income quantile (in medians).

Wealth levels by educational attainment present a similar pattern as income. The wealth gap for Blacks remains relatively flat across educational levels, it becomes smaller at middle and high levels of education in the case of Mexican Americans and it declines monotonically with education for Other Hispanics. Wealth levels by education and income quartiles reveals that the wealth dispersion among Other Hispanics is huge and bigger than the one observed among other groups. Also notice that Hispanics in general present significant differences in the wealth gap across educational groups.

Wealth by age of the household head shows that wealth levels are higher for Hispanics aged between 50 and 60 years old than for those aged between 61 and 70. The opposite is true for African Americans and Whites, who have higher mean and median wealth levels after age 60. As a result, the gap between Hispanics and Whites is much wider among the older group than among the group below 60. Studies based on more comprehensive data

[19]The exception is the median of Other Hispanics, but the wealth drop observed in the third quartile cannot be considered as representative of the population due to the small number of observations (five) in that category.

sets have shown that wealth accumulation peak in the 45-54 age interval and then experiences a decline, which is consistent with the prediction of the life-cycle model where individuals save during working years and dissave during retirement. Since I restrict the sample to non-retired individuals, the observed pattern may reflect the fact that Hispanics still working at the age of 60 or older do not have the option to retire either because they have not considered it at all or because they lack the necessary savings to leave the labor market. In contrast, Whites and Blacks that retire late (that is, after 70) do so as a result of a better-planned strategy and since they remain in the labor market for longer have more time to accumulate assets. See Appendix C for a discussion of how self-selection into retirement may affect this sample.

Table 1 also shows that, across all ethnic and racial groups, households where the head is married hold higher levels of wealth than those where the head is single. But there is not a big difference between the wealth of Mexican Americans that were born in the US and the one of those born abroad. Among the latter, there is a small difference depending on the years spent in US since immigration; indeed, early immigrants have slightly higher mean and median wealth than more recent immigrants. Other Hispanics that were born abroad are poorer than those who are second or third generation. And among foreign born, the wealth of early immigrants is higher in means but lower in medians.

Not only there are differences in wealth levels between Whites and minority groups, but also there are wide disparities in the types of assets where the wealth is invested. This can be seen in Figures 2 and 3, which show the net wealth composition by ethnicity and race, both in terms of access to individual assets and in terms of the importance that each asset has in total wealth. The fraction of Mexican Americans that own a house in 2004 is relatively high (77%), just a bit smaller than the fraction of Whites (86%). But home equity has a slightly bigger share in Mexicans' portfolio (19%) than in Whites' portfolio (18%). The reason is that, even when a higher fraction of Whites have houses and their houses may have a higher market value, Whites also have a much more diversified portfolio. Other Hispanics and African Americans have less access to home equity than Whites and on average it represents a smaller fraction of their total wealth (13 and 12% respectively).

The remaining real assets (other real estate, vehicles and business) have a smaller participation in household wealth across all groups. What it is remarkable is that, as in the case of the main home, having a vehicle seems to have much more importance among Mexican Americans than among Other Hispanics and Blacks, since about 80% have at least one (just 10 p.p. less than the proportion of Whites).

Whereas almost all Whites hold financial assets of some form, the proportion of Hispanics with such assets is much lower (63% Mexican Americans and 71% Other Hispanics), and even lower than the proportion of Blacks (82%). Moreover, most of the financial wealth held by Hispanics consists on checking and savings accounts, since very few have stocks, bonds and other savings accounts such as IRAs or Keoghs. Conditional on having some type of financial asset, its value represent a very small fraction of Hispanics' total wealth (around 4%), which is a third of the fraction for Whites.

The smallest gap in wealth holdings is found in Social Security. Around 90% of Mexicans and Whites and 80% of Other Hispanics and Blacks have S.S. in 2004. But S.S. represents a much higher fraction of total wealth for Hispanics (57%) and Blacks (55%) than for Whites (42%). The explanation has to do with the lack of

diversification of the minorities' portfolio, since their wealth is concentrated in very few assets. Also, this clearly puts in evidence their dependence on S.S. to complement their savings. For all groups, private pensions are less widespread than S.S. Only around 57% of the Whites and between 25 and 31% of the Hispanics have a pension. Its share in total wealth is similar across groups, oscillating between 24 and 30%. Also, in a decomposition not shown here, I observe that there is not a big difference in access across groups to defined benefit and defined contribution plans. However, the former still represents a higher share of total wealth for every racial and ethnic group, despite the movement in last years from defined benefit to defined contribution pension schemes.

I can now turn to look at the wealth changes over time. Table 2 presents a summary of the income and wealth levels, both at the beginning and at the end of each period for which the saving rates were computed (excluding S.S. and pensions). Between 1992 and 1998 the mean wealth of Hispanics declined, whereas the mean wealth of Blacks and Whites experienced an increase. In the same period, the mean income of Other Hispanics (and Blacks), but not of Mexican Americans nor Whites, has also declined. In the following 6-year period, there was an increase in mean wealth and income levels across all ethnic and racial groups, but they were particularly large for Other Hispanics. Table 2 also shows that the wider gaps between Hispanics and Whites are generally in the lower percentile of the wealth and income distribution. The gaps tend to narrow when measured for the highest percentile and for the mean levels of both distributions. And finally, this Table confirms that wealth dispersion seems to be bigger among Other Hispanics. Indeed, the ratio of 25th wealth percentile over the 50th percentile is the lowest among all groups, similar only to the one of African Americans. But the ratio of 75th wealth percentile over the 50th percentile is the highest across all races.

In Table 3 one can compare the unconditional saving rates of both Hispanics groups and of African Americans with those of Whites. Following the standard practice, mean rates were computed as the ratio between average savings and average income accumulated over each six-year period. In turn, the saving rates at the 25th, 50th and 75th percentile are computed for the ratio of savings over income. In 1992-1998, total saving rates were smaller for Hispanics than for Whites and the differences were in general significant (except for the mean saving rate of Other Hispanics). When S.S. and pensions are included in the measure of wealth, the Hispanics' rates remain smaller and the differences are significant for Mexican Americans and for Other Hispanics only at the median and the 75th percentile. In 1998-2004, total saving rates increased for all the groups. Simultaneously, the differences in savings between Whites and Mexican Americans became insignificant except at the median. Note that after accounting for S.S. and pensions, the gap in total saving rates disappears for Other Hispanics in this second period and shrinks considerably for Mexican Americans.

To determine whether these differences in total savings are due to money invested into new assets or purely reflects the effects of asset prices and capital gains, we turn to look at the active and passive saving rates. In 1992-1998 and 1998-2004, the active saving rates of Mexican Americans are negative at the mean (-0.3 and -5% respectively) and zero at the median, whereas for Whites they are positive and between 3 and 5%. Thus, the hypothesis that Mexican Americans and Whites have the same active saving rates can be rejected at the mean and at the median in 1992-1998. For Other Hispanics, it can only be rejected at the median, since their active saving rate is positive at the mean (4%). In 1998-2004, the difference between Hispanics and Whites is

significant at the three percentiles but not at the mean.

Passive savings were significantly smaller for Hispanics than for Whites in 1992-1998, which is expected given their portfolio choices. But this is no longer true in 1998-2004, when some of the Hispanic rates became actually higher. Passive savings in the second period may have responded to the evolution of the houses and stock prices. The sharp increase in housing prices that started in the mid-90s and lasted until their collapse in 2007 has been steepest in California, Arizona, Nevada and Florida, where there is a higher proportion of Hispanics. Similarly, the fall in stock prices from 2000 to 2002 would have contributed to deteriorate the passive saving rates of Whites versus Hispanics since the former have a higher fraction of their wealth in stocks.

For comparison, note that African Americans have smaller saving rates than Whites in both periods, both including and excluding S.S. and pensions, but the differences are significant mainly at the median and at the upper quartile of the savings distribution. The same remains true for active and passive saving rates. Note that the latter are still smaller than those of Whites in the second period, perhaps because Blacks were not affected by the evolution of the housing market prices as much as Hispanics. Also, this result differs from the findings in Gittleman & Wolff (2004), who compute higher average rates of return to capital for African Americans than for Whites during 1984-1994. They attribute this to the path of prices for individual asset categories and acknowledge that must be period specific.

In order to gain a deeper understanding of the patterns observed at the aggregate level, Table 4 shows a breakdown of total saving rates by type of asset. Total savings are decomposed into real assets (main home equity, real estate, vehicles and business), financial assets (IRA/Keogh accounts, stocks, checking and saving accounts, CDs, government bonds, Treasury bills, bonds, and other savings minus debt), Social Security and private pensions (defined benefit and defined contribution/combination plans).

Hispanics save less in real assets than Whites in 1992-1998 but slightly more in 1998-2004, at least in means. As it was explained before, the pattern in the second period is due to Hispanics living in areas where the boom in house prices was more pronounced. As expected, given minorities' limited access to financial markets, saving rates on financial assets are smaller for Hispanics and Blacks than for Whites, both in means and in medians, and this difference is in general significant. The mean rates of saving in Social Security are in general modest for all the races and smaller than the median rates due to the importance of the lower tail of the distribution. The slightly negative rates observed in 1992-1998 may partly reflect measurement errors derived from the imputations for respondents that could not be matched to S.S. earnings data. Indeed, in my sample, a higher fraction of imputations are observed among changes in S.S. that are negative than among changes that are positive. Finally, saving rates on pensions do not seem significantly smaller for Hispanics than for Whites.

In the next section I will turn to multivariate analysis to see if the differences in saving rates noted above remain after controlling for income and other household characteristics.

4.2 Multivariate Analysis

Saving rates depend upon differences in lifetime income. But even among those households with the same income, saving rates may vary due to differences in risk aversion, rates of time preference, or liquidity constraints. Thus, to examine ethnic and racial differences in savings in the pre-retirement HRS sample, the regression that I estimate is:

$$\text{Saving Rate}_i = \beta_0 + \beta_1(\text{Mexican American})_i + \beta_2(\text{Other Hispanic})_i + \beta_3(\text{African American})_i \qquad (3)$$

$$+\gamma\text{Income}_i + \delta X_i + \varepsilon_i,$$

where Mexican American$_i$, Other Hispanic$_i$ and African American$_i$ are indicator variables denoting the ethnicity or race of the household head; Income$_i$ is the household's total income; and X_i is a vector of demographic controls. This vector includes age, a quadratic in the age of the household head, the number of children in the household, dummies for the head's educational attainment, marital status and birthplace (U.S. or foreign born), and region dummies.

An advantage of the HRS is that it provides very good measures of household income for multiple years, and this allows me to control for the average of total family income from the survey years 1994, 1996 and 1998 for the saving rate in 1992-1998 and from years 2000, 2002 and 2004 for the saving rate in 1998-2004. The main concern here is that a spurious negative correlation between saving rates and income may arise if measured income differs from lifetime income since income also enters as a denominator in the saving rate. This could be the case if measured income contains transitory components and suffers from measurement error. However, Dynan et al. (2004) has found in a model similar to this that a simple average of current income eliminates much of the transitory effects of income and thus could be a good proxy for permanent income. They come to this conclusion by adopting an IV approach consisting on instrumenting measured, current income with proxies for permanent income (these instruments are expected to be highly correlated with the permanent component of current income, but not with its transitory component and the measurement error). Using consumption, future and lagged earnings and education as instruments they find similar results to those obtained without instrumenting, the approach adopted here.

The estimation of equation (3) presents a particular challenge derived from the skewness of the distribution of the saving rates. I deal with this issue in two ways. First, I will trim the outliers observations for the OLS regressions in order to obtain estimates of the ethnic and racial differences at the means.[20] Second, I also estimate the same specifications using quantile regressions that are less sensitive to the presence of outliers and can be used on the full samples, without trimmings. They allow to estimate differences in savings at the medians rather than at the means.

[20] I decided to trim (remove outlier values) rather than winsorize the data (convert the outlier values to the closer data point that is not an outlier) since the latter puts more weight on the extremes of the distribution. As a consequence, it amplifies the influence of the values in the tails, and thus, it is a more adequate approach when the data is normally distributed. Since both wealth levels and saving rates have highly skewed distributions with long tails, I opted for trimming the outliers.

For the OLS regressions, I estimate the standard errors using clusters at the family level. In the Appendix Table A1 I check the robustness of the standard errors to different correction methods. I compare the clustered standard errors estimated in an OLS model with those obtained from a non-clustered OLS model to gain further evidence that the clustered and non-clustered estimates are not substantially different. The same is done for the median regressions, by comparing the conventional with the bootstrapped standard errors.

The first set of results are presented in Table 5, which summarizes the determinants of total savings rates, including S.S. and pensions. The reported coefficients indicate the difference of each group saving rate with the one of Whites. Before and after controlling for income the differences between Mexican Americans and Whites are significantly negative, both in means and in medians. More precisely, Mexican Americans save 11 p.p. less than Whites on average, and conditioning on income only they save 7.5 p.p. less. In medians the difference is of 9.4 p.p. for the basic model, and it shrinks to 5.5 p.p. in the model controlling for income. Significant results are still obtained when additional controls are included such as age of the household head, education, marital status, birthplace, number of children and region of residence. When these regressions are estimated for the two periods separately (results not shown here), it becomes evident that this difference arises from lower savings rates in the first period. Similar results are obtained for African Americans, although the size of the gap with Whites is smaller and it disappeared after including additional controls. For Other Hispanics the differences in saving rates are not significant.

Table 6 shows the same regressions as Table 5 but the measures of savings rates exclude S.S. and pensions. In all specifications, the difference between the savings rates of Mexican Americans and Whites are negative and significant (Mexican Americans save between 2.9 and 8.2 p.p. less than Whites, depending on the model). Excluding retirement assets, Blacks also show a negative gap with Whites after controlling for income and demographic characteristics. Note that even the magnitude of the Black-White gap is close to the one between Mexican Americans and Whites. Other Hispanics present lower savings than Whites, but the differences are typically not significant.

In order to understand what is driving the saving differentials with Whites, it is useful to look at the conditional saving rates decomposed into their active and passive components. Table 7 presents the results for active saving rates. The models pooling both periods show in general a significant difference in the active saving rates of Mexican Americans and Whites (7 - 10 p.p. at the mean and 4 p.p. at the median, although the latter is not significant when income and the full set of controls is included). Other Hispanics do not present significant differences in active savings. However, if they are estimated for 1992-98 and 1998-2004 separately, one can see that is the consequence that their lower active savings in the first period, were compensated by higher saving in the second. On the other hand, African Americans do not present substantial differences in active savings rates with Whites, except at the mean when no controls are included. This is consistent with Gittleman and Wolff's (2004) results, who only find a gap for African Americans before controlling for income. Table 8 closes the story since it shows that the unconditional differences in passive saving rates are significant in general for the three groups. However, after adding income and the full set of controls, they become insignificant for Hispanics (in mean and in medians) and for Blacks (in medians).

Finally, we can analyze if the gap in total savings is due to lower accumulation in real assets such as home equity or in financial assets. The results from the Appendix Table A2 indicate that Mexican Americans present a lower rate of accumulation in real assets than Whites, although the results are not always significant after controlling for income and other background characteristics. The same is true for savings in financial assets (conditioning on income, the difference with Whites is significant for the OLS regressions only). African Americans have lower savings in real assets (even with the full set of controls) and in financial assets (but not at the median conditional on income). Since housing has a relatively large share in the portfolio of Mexican and African Americans (see Figure 3), much larger than the share of financial assets, the dynamics of the former may be driving the aggregate saving rates (excluding S.S. and pensions). If these results were breakdown for each period, one can see that the bigger gap in savings in both types of assets are mainly in 1992-1998. Between 1998 and 2004, the gaps have closed since the housing boom has favored the accumulation of real assets among Hispanics and the fall in stock prices has been more detrimental for Whites' savings.

In conclusion, what explains lower total saving rates among Mexican Americans (excluding savings in retirement assets) are the decisions to invest money into a new asset rather than purely differentials in capital gains on assets that they already hold. The opposite argument is true for African Americans: their gap in total savings (excluding S.S. and pensions) can be attributed mainly to lower capital gains rather than to active savings. This means that the gap in savings for Mexican Americans results from the decision to consume more out of income than Whites, whereas the gap for Blacks results from the path of prices followed by the assets in which they choose to save.

4.3 Oaxaca-Blinder decomposition

Using the Oaxaca-Blinder decomposition one can divide the wealth/saving differential between two groups: a part that is explained by group differences in observable characteristics, and an unexplained residual resulting from discrimination or differences in unobserved predictors. Also, I can use this framework to look at the individual contributions of the single predictors or set of predictors to both the explained and unexplained part of the differential.

The decomposition output in Appendix Table A3 reports the difference in the mean wealth and saving rate of Whites minus the ones of Mexican Americans in the first two columns. The wealth gap is USD217 thousands and the gap in saving rates is 8 p.p.. Differences in characteristics ("endowments") between the two groups account for 63% of the wealth gap and 30% of the savings gap. The remaining unexplained fraction is usually attributed to discrimination but also captures the potential effects of differences in unobservable variables. Also the detailed contributions of the single predictors were included for the explained gap (the total component is the sum over the individual contributions). I find that income makes the higher contribution to explain the wealth gap (39%), followed by education (21%) and health (6%). Demographic characteristics (age, age-squared, number of children, marital status, birthplace) and region of residence do not seem to matter. In the case of the savings gap, differences in income and health account for about 17% and 21% respectively of the explained

part of the savings differences. These results contrast with those of Cobb-Clark & Hildebrand (2006), who use a semi-parametric decomposition and find that only around 11-12% of the median (rather than mean) gap remains unexplained. They use a similar set of regressors except that they don't include health.

The last two columns in Table A3 show that the gap in levels and in rates is similar for African Americans (USD233 and 8 p.p. respectively) than for Mexicans. Also, a similar fraction (59%) of the wealth gap in levels but a higher fraction (50%) of the gap in saving rates are explained by differences in characteristics. In that case, all single predictors matter to explain the gap in wealth, but still income and education are the more important, while the latter also matters to explain the gap in savings.

The Oaxaca-Blinder decomposition provides support to the hypothesis that a considerable fraction of the Mexican-White and Black-White gaps in wealth levels cannot be explained by income and other observable characteristics. Given the evidence from the regression approach that saving rates differ across ethnic and racial groups, it is natural to suspect that the saving patterns affect the gap in wealth levels. Thus, understanding the causes of such differences in savings becomes crucial to uncover the ultimate causes of the wealth gap. However, they have received little attention in the literature and so this is the aim of the analysis in the next section.

5 Determinants of the savings differentials

5.1 Inter vivos transfers and inheritances

The results from Section 4 show that total saving rates are lower for Mexican and African Americans than for Whites, even conditioning on income and socio-demographic factors. In this section I will consider whether the beliefs that people held about the probability of giving/receiving financial help and of leaving/receiving inheritances have any influence on their saving decisions. A priori, one would believe that this factor may be more relevant to explain the lower saving rates of Mexican Americans than those of Blacks, since family transfers may have a more direct effect on active savings than in capital gains. In addition, Hispanics are traditionally believed to have strong family ties, and so financial support within that network, including remittances sent back home, is a plausible candidate to affect their decisions to hold assets in the US.

Cox & Fafchamps (2008) claim that what determines whether the transfer motive is "operative" are not *realized* but *potential* transfers. The mere expectation of receiving financial support from family and friends in case of an emergency can crowd-out the accumulation of assets by the household, even if this emergency never occurs and the transfer doesn't take place. If minority groups have stronger family networks than Whites, the potential transfers within that network may affect their need of precautionary savings and result in a different pattern of wealth accumulation. The HRS allows to measure these operative transfers by asking not only about the amount of actual transfers but also about the subjective expectations of private transfers. The subjective expectations are given by responses to the question: "(Using a number from 0-100) What are the chances that you (and your) (husband\wife\partner) will give financial help totaling $5,000 or more to grown children, relatives or friends over the next ten years?" (the questions for transfers received and inheritances are phrased

in a similar way).

Family support networks can affect wealth accumulation in different directions. First, one would expect that transfers received from children, relatives or friends have a positive effect on savings if they are added immediately to wealth. Alternatively, transfers from children to parents can be used to finance consumption in the event of unexpected needs (e.g. a negative health shock that increases medical expenses or a job loss that results in a drop in labor earnings). In this case, the most likely to arise among older respondents, the receipt of transfers will not affect savings. On the other hand, transfers potentially received are likely to act as precautionary savings and, thus, may have a negative effect in current savings. If families know they can rely on private transfers to finance their unexpected needs, their savings will be lower on average. The same effects on savings are likely to arise when distinguishing between actual and potential inheritances received.

Second, transfers given to grown children, relatives or friends can have a negative effect on savings if they are directly taken out of current savings. However, if such transfers are financed by reducing consumption, then household's savings won't be affected. In contrast, the mere expectation of giving such transfers can have a positive effect on current savings if parents decide to accumulate more wealth to give such transfers when the needs arise. For example, parents can save to give financial support to grown children for the down payment of a house. The same reasoning apply when analyzing the effects of actually leaving an inheritance (sometimes called a 'gift' if the person is alive) versus the mere expectation of doing so in the future. The expectation to leave an inheritance may be a proxy for the desire or importance conferred to bequests and thus may have a positive effect on savings.

Ultimately, the answer on the effect of realized and potential transfers on savings is an empirical one. To tackle this question, I re-estimate the saving rates, excluding S.S. and pensions, for each single wave of the HRS. I use data from wave 1 to wave 9, i.e. from survey years 1992 to 1998. I apply the same sample restrictions that were described in section 3, the only difference is that now I keep stable households over two years only (at least) rather than over six years as for the estimates in the previous sections. This results in an increase of the sample size so that after applying all the restrictions leaves 25,820 households, of which 6 percent are Mexican Americans, 4 percent are Other Hispanics, 19 percent are Blacks and the remaining 72 percent are Whites.

In Table 9 I summarize the extent of private transfers (both financial help[21] and inheritances), by ethnic and racial group. Financial help from older to younger generations seems to be more prevalent among Whites than among minority groups ((46 percent of Whites give transfers to children, relatives or friends, versus only 26 of Mexican Americans). But conditional on giving a transfer, Other Hispanics and Blacks give more support to their children than Whites, whereas the gap still remains for Mexican Americans, who give about half the amount given by Whites. The reported perceived probability of giving a transfer somewhat replicates the actual pattern of transfers, since Whites (41 percent) believe on average that their probability of giving a transfer is higher than the one reported by Mexican Americans (21 percent), Other Hispanics (26 percent), and African Americans (25 percent). The opposite pattern is observed when looking at transfers received. In that case,

[21]The measure of financial help from the HRS captures giving money, helping pay bills, or covering specific types of costs such as those for medical care or insurance, schooling, down payment for a home, rent, etc. The financial help can be considered support, a gift or a loan and excludes inheritances, shared housing and shared food.

financial help from younger to older generations is more likely to occur among minorities than among Whites. But conditional on receiving a transfer, my sample does not show substantial differences in the actual amounts received. The mean perceived probabilities of receiving financial support also reproduce this pattern, although the gap with Whites is slightly smaller than the one observed in the actual figures (Mexican Americans report almost the same expectations as Whites).

While the data on actual inheritances left is not available, the HRS also asks about the perceived probability of such transfer. There is a widespread belief among Whites (74 percent) of leaving a bequest of at least $10,000 over the next 10 years, whereas the probabilities reported by the other groups are smaller and between 40 and 50 percent. This may be reflecting the differences in wealth holdings that make inheritances less affordable for minorities. Also note the relatively low standard errors, which make these figures the more reliable of all the measures of subjective probabilities included in Table 9.[22] In contrast, receiving an inheritance is a very infrequent event in this sample, since only 6 percent of Whites and less than one percent of the other groups report having received one. Conditional on having received an inheritance, the differences in the actual amounts are not so striking. The higher conditional mean of Other Hispanics, probably reflects the highly skewed distribution of wealth for this group. Finally, the perceived probability of receiving an inheritance is 28 percent for Whites and less than 10 percent for the other three groups. Also the amount expected, conditioning on attaching a positive probability to receive an inheritance, is larger for the former.

In Tables 10 and 11 a multivariate framework is used to look at the ethnic differences in actual and potential transfers, after controlling for income and some other background characteristics. Column 1 in Table 10 shows the marginal effects estimated from a Probit model for the decision of whether to give a transfer, column 2 corresponds to the marginal effects from a Tobit model for the actual amounts given (this model allows to account for the large proportion reporting zero transfers) and column 3 shows the Probit marginal effects for the perceived probabilities of transfers. The dependent variable for column 3 is constructed as a binary indicator that takes value one if the reported probability (in increments of 10) is larger than 50 percent. Columns 4, 5 and 6 estimates the same models for transfers received. The first thee columns reveal that Hispanics are less likely than Whites of giving a transfer of $5,000 or more over the next 10 years to children, relatives or friends, even conditioning on income and demographic characteristics. And among those who give transfers, the amounts are smaller for Mexican Americans, who give on average $105 thousands less than Whites. Consistent with that, Hispanics and Blacks hold lower perceived probabilities than Whites of giving a transfer. Also note that households with a head born in US (not shown here) are significantly less likely to give transfers. This may be due to the larger remittances sent by foreign born families that keep social ties in their place of birth. Columns 4 to 6 show that Mexican and African Americans are slightly more likely to receive a transfer than Whites, although this transfers are smaller for Blacks than for Whites. Other Hispanics and Blacks think that their likelihood of receiving transfers is higher.

[22] In general, the standard deviations of the perceived probabilities of giving a transfer, either financial help or an inheritance, are smaller than those corresponding to receiving a transfer. This makes the analysis more reliable for the former than for the latter. In addition, there is evidence that people are likely to under-report actual transfers received because they weight them less than the actual transfers given.

Table 11 summarizes similar information for inheritances. Other Hispanics and Blacks believe that they are less likely to leave an inheritance over the period considered. Scholz & Levine (2003) argue that this gap does not indicate that Whites place a higher importance on leaving a bequest but the fact that they find bequests more affordable. The three groups are also significantly less likely of receiving an inheritance. But conditional on receiving an inheritance, Other Hispanics receive substantially more. Similar results (not shown in this Table) were obtained for retired individuals, but for them the ethnic and racial gaps in transfers and inheritances received are much larger. In general, the ethnic and racial gaps summarized in Tables 10 and 11 reveal some consistency between actual and subjective probabilities.

5.2 The effect of transfers and inheritances on savings

Given the significant differences in perceptions about the probability of private transfers and inheritances across ethnic and racial groups, it is natural to ask next whether they have any influence on households' savings decisions. I will tackle this question by estimating a model for the whole sample and each ethnic and racial group, with the following specification:

$$S_{i,t} = \beta_0 + \beta_1 \text{ExpW}^k_{i,t-1} + \beta_5 \text{X}_{it} + \alpha_i + u_{i,t} \qquad \text{for } k = 1, 2, 3, 4 \tag{4}$$

where the dependent variable is an indicator that take value one if the saving rate of family i between years $t-1$ and t is positive and zero otherwise[23]; $\text{ExpW}^k_{i,t-1}$ is the perceived probability of: 1) giving a transfer of \$5,000 or more to grown children, relatives or friends; 2) receiving a transfer of \$5,000 or more from children, relatives or friends; 3) leaving an inheritance of \$10,000 or more and 4) receiving any inheritance. All subjective probabilities corresponds to the reports of family i at time $t-1$ for the next 10 years (recoded as a binary variable, as explained in the previous section). $\text{X}_{i,t}$ represents observed household characteristics at time t that may affect the preferences for savings (permanent income and its square, age and its square, number of children, education, whether the household head is married, year and region dummies).[24] The term α_i captures the family-level fixed-effects that account for the correlation between the regressors and time-invariant characteristics.

In the fixed-effects model, the regressors can be correlated with the time-invariant component of the error (α_i) but not with the idiosyncratic error $u_{i,t}$. If the latter is not correlated with beliefs about the probability of transfers and inheritances and with the other time-varying controls, then the estimated coefficients will capture the causal effects of potential transfers on savings. Table 12 presents the results of estimating equation 4 for the whole sample and for each ethnic and racial group separately using a fixed-effects model. The estimates imply that a high perceived probability of leaving an inheritance would reduce the probability of saving over the next two years for the whole sample (5.4 percent), Mexican Americans (8.9) and Whites (6.2). One would have expected a positive coefficient if the desire to leave a bequest encourages savings. The negative coefficient

[23]For this model specification, the use of a binary indicator as the dependent variable renders more reasonable estimates than the amount of savings.

[24]Note that some of these variables such as education or the dummy for marital status do present some within variation, and for this reason they were kept as controls in the FE model.

can result if the opposite is true: knowing that they can afford to leave an inheritance of $10,000 or more during the next 10 years, individuals may prefer to start consuming more of their current income and reduce or even stop the accumulation of assets. On the other hand, the table shows no effect of holding a higher belief about the probability of receiving an inheritance on savings.

The coefficients for the perceived probabilities of giving and receiving a transfers are significant for the whole sample, but have the opposite sign as the ones conjectured in the previous section. The assumption that the perceived probabilities are uncorrelated with the time-varying component of the error is more reasonable in the case of inheritances, but less likely for inter vivos transfers that tend to be affected by changes in current economic conditions. If that assumption does not hold, then the FE estimation becomes inconsistent and one needs to instrument for perceived probabilities of giving and receiving a transfer. Following the perceptions-based literature, I will choose the instruments based on the factors that influence individual perceptions about the probability of private transfers (Lochner 2007).[25] One can presume that individuals with strong family support networks hold beliefs about the probability of giving/receiving financial help, which influence their decision to save. Household income and whether the household gives/receives transfers affect their subjective expectations about the probability of giving/receiving transfers in the future. Beliefs may also respond to expected income of the recipients/givers, i.e., of children, relatives and friends. More formally, a simple rule for updating beliefs about the probability of giving a transfer can be formulated as:

$$E(\pi/H_{i,t}) = f(E(\pi/H_{i,t-1}),\, I_{i,t},\, I_{j,t},\, TG_{i,t},\, Z_{j,t}) \tag{5}$$

where information is accumulated according to $H_{i,t} = (H_{i,t-1},\, I_{i,t},\, I_{j,t},\, TG_{i,t}, Z_{i,t})$, and depends on the giver and recipient households' income between $t-1$ and t ($I_{i,t}$ and $I_{j,t}$), on the decision to give a transfer between $t-1$ and t ($TG_{i,t}$), and on any new information about the economic conditions of the giver and recipient families ($Z_{i,t}$) (for example, whether the household head gets married, whether the family moves to a new state, whether a child died, etc.). I will make the following assumptions on the updating equation: i) The current perceived probability of giving a transfer should be increasing in the previous expected probability ($f_1 \geq 0$); ii) The expected probability of giving a transfer should be increasing in household income and decreasing in recipient's income ($f_2 \geq 0$ and $f_3 \leq 0$); iii) The effect of having given a transfer in the past should increase the subjective probability of giving a transfer in the future ($f_4 \geq 0$).

Based on equation (5) that captures the relation between subjective probabilities of giving a transfer, $\text{ExpTG}_{i,t}$, and $E(\pi/H_{i,t})$, I can estimate the following structure of updating:

$$\text{ExpTG}_{i,t} = \gamma_1 \text{ExpTG}_{i,t-1} + \gamma_2 I_{i,t} + \gamma_3 I_{j,t} + \gamma_4 TG_{i,t} + \gamma_5 Z_{j,t} + \eta_{i,t} \tag{6}$$

Exploiting the panel structure of the data, one can allow for unobserved individual fixed effects $\eta_{i,t} = \nu_i + \epsilon_{i,t}$ where ν_i is a fixed effect. I will assume that only Z variables are strictly exogenous, i.e., that its entire history is

[25] Lochner (2007), for example, looks at the effects of beliefs on crime and shows that individuals update their beliefs rationally: criminals who avoid arrest perceive a lower probability of arrest, while those who are arrested perceive a higher probability.

independent of $\epsilon_{i,t}$. For $I_{i,t}$, $I_{j,t}$ and $TG_{i,t}$ I will make the weaker assumption that they are uncorrelated with the current shock $\epsilon_{i,t}$ and with future errors but are correlated with past errors, that is, they are "predetermined". This implies that future values of $I_{i,t}$, $I_{j,t}$ and $TG_{i,t}$ will depend on $\epsilon_{i,t}$. This assumption is important because it allows future income, and therefore future saving rates, to depend on current beliefs about the probability of giving a transfer. Since one lag of the dependent variable is included as a regressor, the fixed effects should be eliminated by first-differencing (rather than mean-differencing). In order to obtain consistent estimates in the presence of lagged regressors, an IV estimation of the parameters is implemented in the FD model. Table 13 presents the result of both the OLS estimation and the IV estimation for the model in first-difference using two-step GMM, for the whole sample only.[26]In the last two columns analogous specifications are used to estimate the perceived probability of receiving a transfer. The results show that the subjective expectations in the previous period are significantly and positively correlated with current subjective expectations. The same is observed for actual transfers given/received in the previous period (i.e. between $t-1$ and t), which present a high positive correlation with perceived probabilities reported in the current period. The coefficient on family income has the expected sign in all cases, but is it only significant for the OLS estimates. Finally, child income also has the expected sign and is significant but only for the expected probability of giving a transfer estimated with both the OLS and IV FD model. With a few exceptions, these results indicate that our choice of predictors do reasonably well to estimate the perceived probabilities.[27]

Finally, we can re-estimate the relationship between the perceived probability of transfers and the saving decision. Thus, I will instrument equation 4 but only for the perceived probabilities of giving and receiving a transfer. I will eliminate the fixed-effects of the model that are correlated with the expected beliefs by first-differencing equation 4. Thus, I need to instrument for $\triangle \text{ExpW}_{i,t-1}$, which can be correlated with $\triangle u_{i,t}$ since $u_{i,t-1}$ affects $S_{i,t-1}$. I will assume that the time-varying component of the error ($u_{i,t}$) is independent of X_i in every period (strong exogeneity), of $\text{ExpW}_{i,t-1}$ and its past values, and of all the lagged values of the givers and recipients' income and of the lagged decision to give a transfer (weak exogeneity). Thus, if beliefs and past savings and recipients' income are predetermined rather than strictly exogenous, I can use $\text{ExpW}_{i,t-2}$, $I_{j,t-1}$ and $TG_{i,t-1}$ as instruments for $\triangle \text{ExpTG}_{i,t-1}$. I will only drop $I_{i,t-1}$ from the set of instruments since this I am already controlling for a proxy for permanent income (computed as the average of three years income), and also because in any case its predictive power is weak in the FD IV specifications of Table 13 and in the first stage estimates of equation 4.

The results for the estimates of the decision to save on the perceived probability of giving a transfer are presented in Table 14 and of receiving a transfer in Table 15. In both cases, none of the coefficients are significant after instrumenting the perceived probability reported at the beginning of the period with lagged subjective probability, children income and past decision to give/receive a transfer respectively. This implies that

[26]In order to improve precision, I use an estimator with better finite sample properties than the Arellano-Bond estimator, which is based on the assumption that $E(ExpTG_{i,s} \triangle \epsilon_{i,t}) = 0$ for $s \leq t-2$. The estimator I use, known as the Arellano-Bover/Blundell-Bond estimator, assumes additionally that $E(\triangle ExpTG_{i,t-1} \epsilon_{i,t}) = 0$ so that $\triangle ExpTG_{i,s-1}$ is used as an instrument and also the first-differences of the predetermined variables can be used as instruments.

[27]The worst fit for the subjective expectation of receiving a transfer may be explained by the larger variance of such probabilities, possibly due to the higher propensity to misreport such transfers.

the significant coefficients found in the first two regressions from Table 12 were resulting from an estimation bias. This leads us to conclude that there is not enough evidence in favor of hypothesis that potential financial help play an important role to explain the differential in savings decisions. But one cannot rule out that measurement errors explain the absence of significant effects in my results, at least for the subjective expectation of receiving a transfer. Only the expectation of leaving an inheritance seems to play a more important role for saving decisions, but the channel through which this happens remains the subject of further research. Finally, note that these results are consistent with the findings in the literature for actual transfers as shown in McKernan et al. (2011), who conclude that inheritances, but not financial support, may have a significant effect on the wealth gap.

6 Conclusion

While there is a broad literature looking at the reasons for the gap in wealth between Black and White families, little is known about the gap between Hispanics and Whites. This study attempts to fill this gap by, first, documenting the ethnic and racial differences in saving rates for families with the same level of income, one possible explanation for the wealth gap. Second, the role played by strong support networks, more common among minorities, on the savings differential is analyzed by exploring the effects of potential (i.e. non-realized) transfers.

Using data from the HRS for the periods 1992-1998 and 1998-2004, I compute total saving rates, both with and without S.S. and pensions. Controlling for income and other demographic characteristics, I find that total saving rates for Mexican and African Americans are substantially lower than for Whites when retirement assets are excluded (the inclusion of S.S. and pensions do not alter substantially the results, despite that they represent a significant portion of household wealth). Moreover, for Mexican Americans this is due to the direct decision of investing less money in new assets (active savings), whereas it reflects lower capital gains (passive savings) in the case of African Americans. Most of the dynamics described for the whole period are driven by the pattern of savings in 1992-98. In the second period (1998-2004), two factors operated in the opposite direction and reduced to some extent the savings gap: the distortions in the sub-prime market that made houses more affordable to low-income people, specially to Hispanics traditionally excluded from the housing market, and the fall in stock prices that has eroded mainly the capital gains of Whites. Notice that since we are missing the years of the financial crisis in this first analysis, we do not account for the dramatic drop in savings (particularly for Hispanics) that took place after 2007.

In the second part of the study, specific questions from the HRS aimed at measuring the perceived probabilities of giving/receiving a transfer and of leaving/receiving an inheritance were used to guide the analysis. By instrumenting the subjective probabilities of giving/receiving a transfer with their lagged values, the lagged values of actual transfers given/received, and children income, I find no effect of those potential financial help on saving decisions for any group. On the other hand, the expectation of leaving (but not receiving) an inheritance does have a significant and negative effect on saving decisions of Mexican Americans and Whites.

Further research is needed to understand the mechanism through which this expectation operates. In any case, it seems unlikely that it is contributing to widen the ethnic gap in savings since it also has a large negative effect on Whites savings decisions. Thus, despite the strong networks that minorities form in their family and community, the results described imply that private transfers within that network do not seem to play a key role in explaining savings differences. This is in line with the findings in McKernan et al. (2011), who conclude that only large gifts and inheritances are important to explain the Black-White gap in wealth, but they do not find significant effects from private transfers to support families.

The study of the racial and ethnic gaps is justified not only by the intrinsic relevance of the racial aspects of economic inequality, but also because it is an important step towards understanding the causes of wealth inequality in a broader sense. By digging deeper into the underlying causes of the savings differential one can make better conjectures about the optimality/adequacy of their savings behavior. The existence of such gap in active savings may be a first -although not conclusive- indicator that Mexican Americans are not saving optimally for retirement.[28] If Mexican Americans do not have preferences about inter-generational transfers, saving too little may be inefficient since their lifetime utility can be increased by reallocating consumption across time. Moreover if the generosity of Social Security is reduced in the future, then it becomes even more important to understand if their savings behavior on other assets is indeed optimal.

There are other plausible explanations for the differential in wealth accumulation that were not addressed in this study and deserve consideration by future research on the determinants of savings. First, Hispanics and African Americans have high levels of expenses on goods that Whites do not. For example, Charles et al. (2009) present evidence that Hispanics and Blacks spend relatively more on conspicuous goods than Whites after controlling for permanent income, as a way to signal status. Moav & Neeman (2012) show that such behavior leads to an equilibrium where the saving rate is increasing in income, resulting in a poverty trap. Also, ethnic and racial minorities are likely to pay a larger amount on rent because they lack housing, and on medical goods due to their poorer health (Perez 1998). Second, differences in rates of time preference, risk aversion, liquidity constraints and other factors related to preferences, such as time inconsistency, may also have an independent role to explain racial and ethnic differences in savings. Black and Hispanic households are less willing to take risks and have significantly shorter planning horizons than do other groups, even after conditioning on income, age and education (Scholz & Levine 2003). Third, they benefit extensively from asset-tested social insurance programs that may discourage wealth accumulation. But since this mechanism does not seem to have affected significantly wealth accumulation among poor households, it is unlikely to play a key role in this context either.

But whatever the answer to this question, it will affect whether the savings differential results from new flows of money or from pure capital gains. This distinction is important since policy recommendations to encourage savings may differ in one case and the other. On the one hand, to promote active savings it may be necessary to target the number of working hours, wages or consumption levels. Direct policies that foster asset accumulation,

[28] Notice that it is not clear either that the typical American household, which has a behavior more similar to Whites, is saving optimally (Scholz et al. 2006). In order to determine the optimality of households' savings one would need to make assumptions about future consumption and preferences. And to assess the adequacy of savings one needs to make value judgments relating to needs at older ages.

such as those facilitating savings on down payments for houses, may be another effective way to promote active savings. On the other hand, the equalization of passive savings may require more financial literacy so that minorities can make more savvy portfolio-choices.

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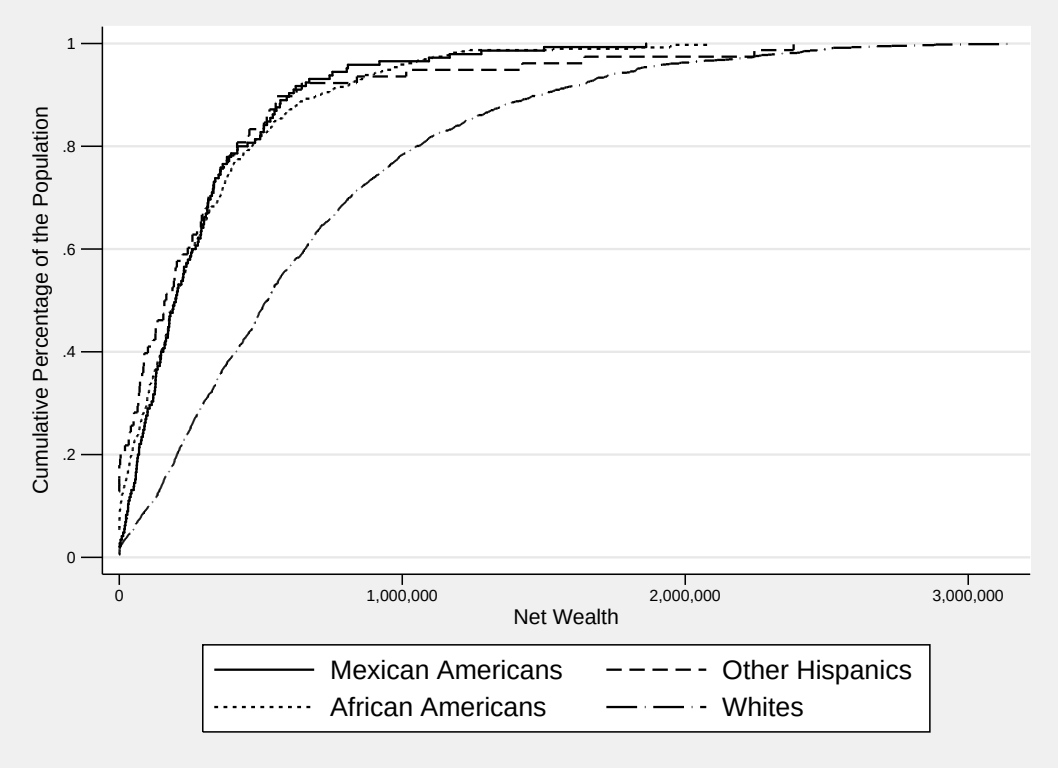
Figure 1: Cumulative Distribution of Net Wealth by Ethnic Group, 2004



Note: Sample consists of HRS households whose head was the same between 1998 and 2004 and was not retired during those years. The top and bottom 2 percent of total wealth in 2004 was dropped.

Table 1: Mean and Median Net Worth by Household Characteristics, 2004

	Mean values				Median values			
	Mexican Amer.	Other Hispan.	African Amer.	Whites	Mexican Amer.	Other Hispan.	African Amer.	Whites
All non-retired households	351.2	398.2	307.3	702.9	242.6	198.9	191.9	569.3
excl. S.S. & Pensions	130.2	214.0	81.2	341.1	51.5	15.0	30.0	196.0
Income quartile								
$<$ 25th	52.7	14.6	21.8	102.3	32.0	0.1	0.4	21.4
25th - 50th	135.0	195.9	65.1	166.0	52.1	131.2	50.0	96.0
50th - 75th	237.1	105.3	141.0	269.8	194.0	33.0	106.0	178.9
$>$ 75th	315.6	1,224.8	378.3	616.6	253.8	1,341.0	174.2	507.0
Age of head								
50 - 60	154.5	231.7	76.8	324.0	65.0	60.0	16.1	188.0
61 - 70	105.1	198.5	86.9	361.6	33.0	9.0	37.0	210.2
Education of head								
No high school diploma	73.8	108.9	58.7	182.7	33.0	0.1	11.1	58.0
High school graduate	212.9	166.3	60.9	261.8	115.0	43.0	21.5	154.0
College/postcollege grad.	334.0	1,303.3	193.7	521.8	318.0	2,067.0	101.5	394.0
Marital status of head								
Married	160.8	109.4	134.8	417.0	62.0	43.0	64.0	266.0
Single	76.7	274.5	56.8	191.0	24.0	9.0	5.0	92.8
Birthplace of head								
US born	123.6	583.8	72.9	335.4	50.0	117.5	25.0	190.0
Foreign born	142.1	135.9	186.0	498.2	52.1	9.0	118.0	292.0
Years in US since immigration								
30 years or less	112.2	50.1	83.6	687.1	40.0	15.0	0.0	301.0
more than 30	131.9	284.7	81.1	337.1	52.1	11.8	30.5	193.0

Note: Wealth values are in thousands of 2004 dollars and exclude S.S. and pensions except when indicated. Sample consists of HRS households whose head and spouse were the same between 1998 and 2004, the head was not retired during those years and was between 50 and 70 years old in 2004. Househods with mixed-ethnicity couples are excluded. The top and bottom 2 percent of total wealth in 2004 was dropped to compute mean values. All data are weighted using HRS household weights for 2004.

Figure 2: Percentage of Households Holding each Type of Asset, 2004

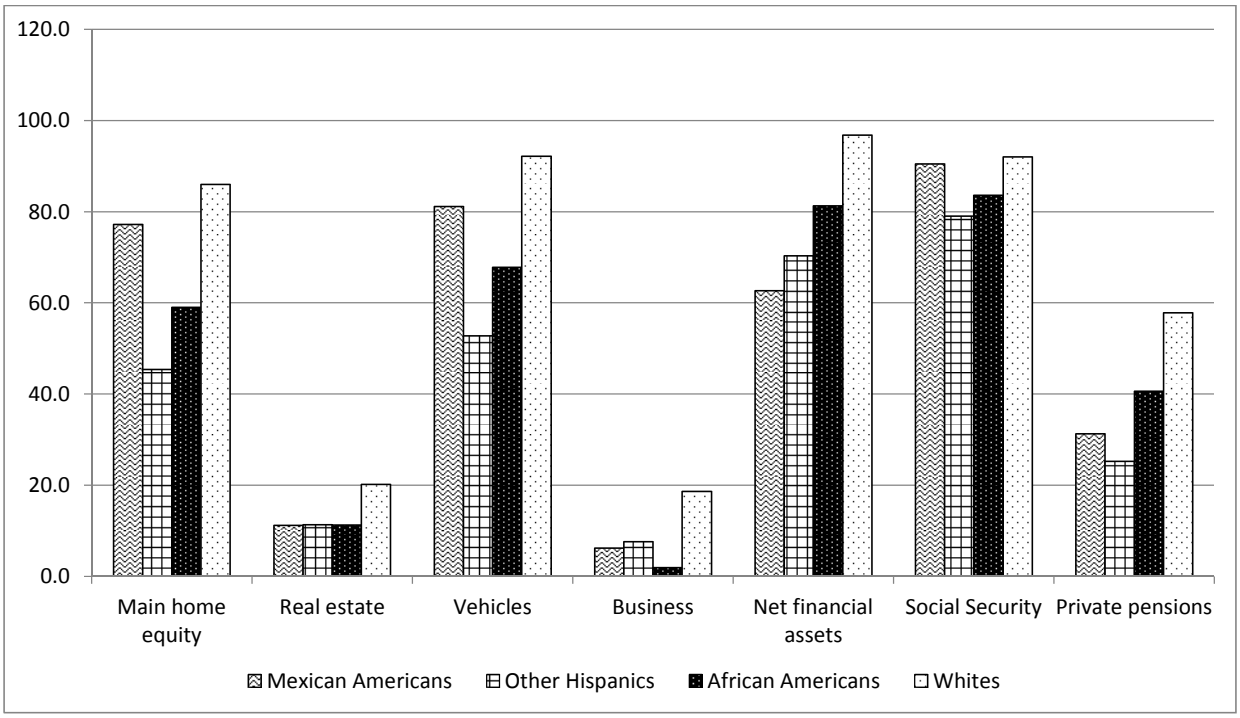
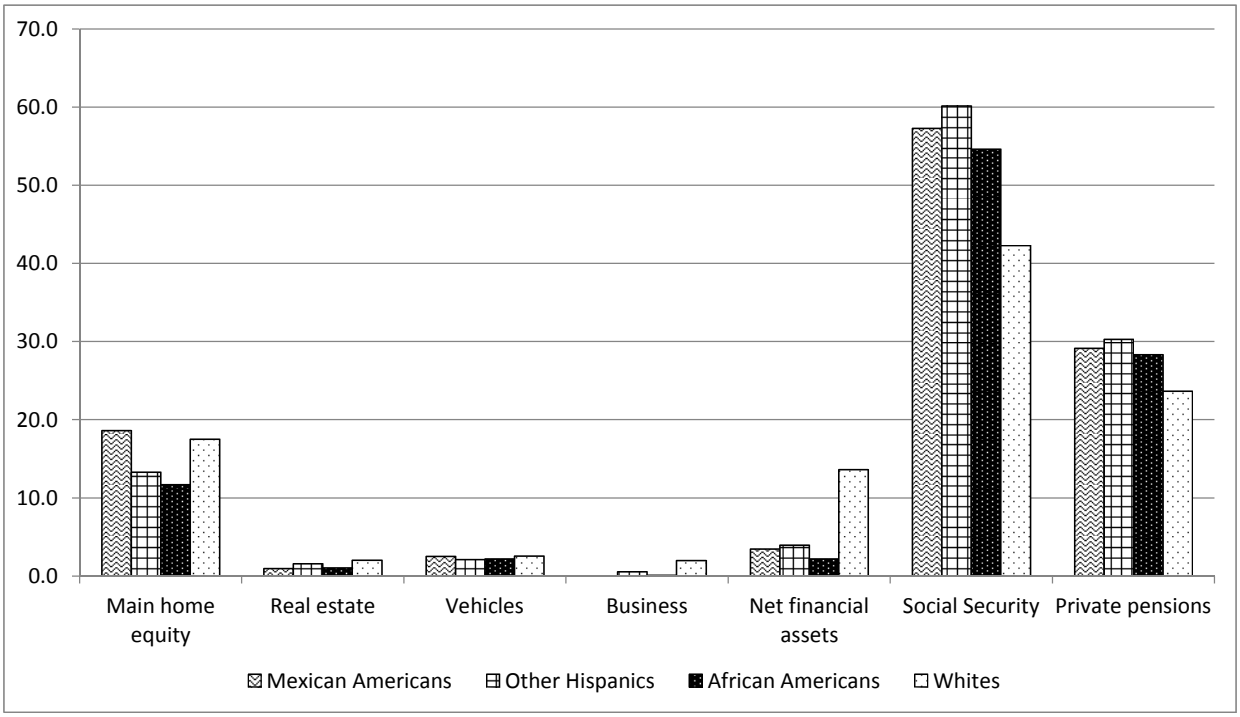


Figure 3: Percentage of Total Household Wealth, 2004



Note: Sample consists of HRS households whose head and spouse were the same between 1998 and 2004, the head was not retired during those years and was between 50 and 70 years old in 2004. Households with mixed-ethnicity couples are excluded. Net financial assets include IRA/Keogh accounts, stocks, checking and saving accounts, CDs, government bonds, Treasury bills, bonds, and other savings minus debt. The top and bottom 2 percent of each component's share in total wealth in 1992-1998 (1998-2004) were dropped. All data are weighted using the HRS household weights for 1998 (2004).

Table 2: Wealth and income levels by ethnicity and race, 1992, 1998, and 2004

	Wealth					Income				
		Percentile			Nr. of		Percentile			Nr. of
Year	Mean	25th	50th	75th	obs.	Mean	25th	50th	75th	obs.
1992										
Mexican Amer.	79.4	2.1	36.0	99.0	168	27.5	10.0	19.7	36.0	161
Other Hispanics	70.0	0.0	2.6	55.5	101	33.1	11.9	19.7	42.9	95
African Amer.	69.2	0.0	22.7	76.3	534	33.7	10.4	23.7	45.4	536
Whites	218.7	48.6	126.1	272.5	1,936	59.4	27.8	49.6	79.2	1,945
1998										
Mexican Amer.	67.7	4.8	39.4	85.6	168	29.3	10.1	20.4	38.2	161
Other Hispanics	64.3	0.0	5.1	90.1	101	31.3	7.9	20.8	39.4	95
African Amer.	72.3	0.1	25.9	82.8	534	32.6	8.6	22.4	45.0	536
Whites	279.4	55.2	149.2	346.3	1,936	65.5	27.7	52.1	87.3	1,945
1998										
Mexican Amer.	98.2	13.0	51.2	92.3	145	39.3	9.9	25.7	49.0	140
Other Hispanics	75.0	0.0	2.3	69.1	73	33.6	9.1	22.1	34.5	70
African Amer.	71.9	0.2	21.4	82.8	377	39.0	9.8	28.2	52.4	378
Whites	250.1	48.4	135.1	313.1	1,529	76.3	33.1	60.4	98.3	1,537
2004										
Mexican Amer.	130.2	18.0	52.1	153.0	145	42.5	13.3	27.8	50.5	140
Other Hispanics	214.0	0.0	15.0	141.8	73	42.4	8.7	23.0	44.0	70
African Amer.	81.2	0.2	35.6	104.5	377	39.8	11.8	26.4	55.0	378
Whites	341.1	65.0	190.5	455.0	1,529	76.6	31.0	58.5	101.0	1,537

Note: Wealth and income values are in thousands of 2004 dollars. The measure of wealth excludes S.S. and pensions and the measure of income is total household income (before adjusting for employer contributions to S.S. and pensions). Sample in panel A (B) consists of HRS households whose head and spouse were the same between 1998 and 2004, the head was not retired during those years and was between 50 and 70 years old in 1998 (2004). Households with mixed-ethnicity couples are excluded. In Panel A (B), the top and bottom 2 percent of wealth and income in 1992 and 1998 (1998 and 2004) were dropped. All data in Panel A (B) are weighted using the HRS household weights for 1998 (2004).

Table 3: Saving Rates by Ethnicity and Race, 1992-1998 and 1998-2004

	Mexican Americans				Other Hispanics				African Americans				Whites			
		Percentile				Percentile				Percentile				Percentile		
Saving rate	Mean	25th	50th	75th	Mean	25th	50th	75th	Mean	25th	50th	75th	Mean	25th	50th	75th
1992-98																
Total	-7.8***	-25.4**	0.0***	14.2***	-1.3	-5.0*	0.0***	6.8***	4.4	-8.6	0.0***	15.7***	15.7	-8.9	6.5	28.5
+ SS, pens	-7.6***	-48.9***	0.5***	34.7*	11.2	-14.1	7.0*	26.3*	7.0	-27.7*	5.4***	34.9**	17.9	-20.0	13.4	45.1
Active	-0.3*	-7.9	0.0***	12.1	4.4	-6.6	0.0***	11.3	1.3	-4.3	0.4***	10.0***	4.7	-6.1	3.0	14.1
Passive	-7.5***	-19.8	0.0**	12.8***	-5.7**	-12.8	0.0***	10.0***	3.1***	-10.4	0.0***	11.2***	11.0	-10.0	2.6	24.2
1998-04																
Total	16.0	-12.1	3.4**	40.1	23.2	0.0***	3.0***	29.7	5.4***	-8.7	0.1*	14.4***	23.2	-6.6	9.2	36.7
+ SS, pens	24.5	-38.5***	16.5	74.3	50.3	0.0***	30.5***	72.8	22.8	-19.0	16.0	53.7	30.4	-14.8	21.3	58.1
Active	-4.9	-18.1**	0.0***	7.9***	4.9	-3.3*	0.0*	7.3***	-4.3	-6.6	0.0***	7.8***	5.4	-7.1	3.6	15.7
Passive	21.0	-8.9	6.9	44.4	18.4	0.0***	0.0***	31.4	9.6	-7.8	0.0	16.3***	17.8	-6.7	5.9	30.4

Note: Mean saving rates for each group equal the ratio of mean saving over six times average annual income in the same period. Percentile saving rates are computed for the ratio of saving over six times income during the same period. Active saving is the sum of net flows of money saved in individual assets. Passive saving is the difference between total change in wealth and active savings over a 6-year period. Sample consists on households whose head and spouse were the same and the head was not retired in 1992-1998 (1998-2004) and was between 50 and 70 years old in 1998 (2004). Households with mixed-ethnicity couples are excluded. The samples are trimmed only for mean rates by dropping the top and bottom 2 percent of total saving over 1992-1998 (1998-2004) and of average income over 1993-1997 (1999-2003).

*, **, *** difference with Whites significant at 10, 5 and 1 percent level

Table 4: Saving Rates by Ethnicity and Race and Type of Asset, 1992-1998 and 1998-2004

	Mexican Americans				Other Hispanics				African Americans				Whites			
		Percentile				Percentile				Percentile				Percentile		
Asset	Mean	25th	50th	75th	Mean	25th	50th	75th	Mean	25th	50th	75th	Mean	25th	50th	75th
1992-98																
Real assets	-9.8**	-17.6	0.0***	8.9	-2.0	-2.0**	0.0***	6.2**	1.7	-6.8	0.0***	7.6**	2.4	-6.9	1.7	12.0
Financ. assets	2.3**	-1.4	0.0***	2.5***	3.3*	-1.6	0.0***	2.2***	4.0**	-1.6	0.0***	3.1***	11	-2.5	2.1	14.2
Social Security	-2.6**	-5.0	3.3	16.5**	-0.1	-0.9	1.9	10.5	-1.8	-3.3	3.8	10.2***	-0.4	-1.3	3.0	7.4
Pensions	-5.1	-17.8	5.0	21.5	12.6	-7.0	6.4	15.7**	11.4	-10.3	3.8	22.5	9.2	-4.5	6.9	23.6
1998-04																
Real assets	15.1***	-9.2	2.0*	24	23.0	0.0***	0.0***	20.6	5.7	-2.5	0.0***	9.9***	12.7	-3.2	5.2	21.4
Financ. assets	2.6	-1.2***	0.0***	2.5***	3.6*	-0.3***	0.0***	5.2***	0.0**	-2.8*	0.0***	3.2***	6.0	-4.4	1.4	13.3
Social Security	4.6***	-33.5***	11.1	30.3***	9.0	0.0	9.5	24.9	6.5	0.0	13**	25.9***	5.9	0.0	10.2	18.4
Pensions	21.6	-12.5	3.9	16.5	22.8*	6.1	29.4*	46.8	33.2**	-1.1*	17.3**	44.2***	11.9	-6.1	5.6	22.9

Note: See the note to Table 3 for definition of saving rates. Real assets comprise main home equity, real estate, vehicles and business. Financial assets include IRA/Keogh accounts, stocks, checking and saving accounts, CDs, government bonds, Treasury bills, bonds, and other savings minus debt. Social Security wealth is computed assuming claiming at age 70. Pension wealth includes Defined Benefit values at expected age of retirement and Defined Contribution/Combination account balances. Sample consists on households whose head and spouse were the same, the head was not retired in 1992-1998 (1998-2004) and was between 50 and 70 years old in 1998 (2004). Households with mixed-ethnicity couples are excluded. The samples are trimmed only for mean rates by dropping the top and bottom 2 percent of total saving over 1992-1998 (1998-2004) and of average income over 1993-1997 (1999-2003).

*, **, *** difference with Whites significant at 10, 5 and 1 percent level

Table 5: Total Saving Rates including Social Security and Pensions, 1992-1998 and 1998-2004

	OLS	OLS	OLS	Median	Median	Median
Mex. Amer.	-.111**	-.075*	-.110**	-.094***	-.055*	-.082**
	(.043)	(.044)	(.052)	(.032)	(.032)	(.040)
Other Hisp.	.030	.060	.042	-.030	-.007	-.007
	(.051)	(.052)	(.060)	(.042)	(.041)	(.051)
Afr. Amer.	-.072***	-.041	-.035	-.071***	-.026	.000
	(.024)	(.025)	(.027)	(.020)	(.020)	(.022)
98-04'	.160***	.153***	.211***	.092***	.078***	.120***
	(.020)	(.020)	(.021)	(.016)	(.015)	(.017)
Constant	.088***	.035**	-5.807***	.128***	.070***	-5.841***
	(.014)	(.018)	(1.887)	(.012)	(.014)	(1.482)
Other controls	No	Income	Income + others	No	Income	Income + others
Adj. R-Square	.016	.021	.046			
Pseudo R-Square				.004	.007	.019
Observations	5,011	5,011	4,928	5,246	5,246	5,159

Notes. The table reports the coefficients from OLS and median regressions of the total saving rate on ethnicity and race dummies and other controls. The observations for the two periods are pooled and the coefficient on 98-04' captures the fixed-effects for the second period. All specifications that control for income, also control for its square. In addition, specifications in columns (3) and (6) control for age of the head and its square, the number of children in the household, the education of the head and include a dummy if the household head is married, a dummy if the head is born in U.S., and region dummies. Robust standard errors (clustered at the family level) and trimmed samples are used for OLS regressions only.

Table 6: Total Saving Rates excluding Social Security and Pensions, 1992-1998 and 1998-2004

	OLS	OLS	OLS	Median	Median	Median
Mex. Amer.	-.082***	-.049*	-.059*	-.068***	-.029*	-.035*
	(.027)	(.028)	(.032)	(.015)	(.015)	(.018)
Other Hisp.	-.027	.002	-.006	-.068***	-.026	-.027
	(.028)	(.029)	(.037)	(.019)	(.020)	(.023)
Afr. Amer.	-.081***	-.053***	-.040**	-.068***	-.029***	-.019*
	(.014)	(.014)	(.016)	(.009)	(.010)	(.010)
98-04'	.073***	.068***	.072***	.015**	.007	.016**
	(.013)	(.013)	(.014)	(.007)	(.007)	(.008)
Constant	.088***	.040***	-2.365*	.068***	.020***	-.517
	(.010)	(.012)	(1.243)	(.005)	(.007)	(.673)
Other controls	No	Income	Income + others	No	Income	Income + others
Adj. R-Square	.012	.022	.025			
Pseudo R-Square				.006	.013	.015
Observations	5,034	5,034	4,951	5,246	5,246	5,159

Notes. Specifications are the same as specifications used in Table 5 but all the saving rates in this table exclude wealth accumulation on Social Security and private pensions. Robust standard errors (clustered at the family level) and trimmed samples are used for OLS regressions only.

Table 7: Active Saving Rates excluding Social Security and Pensions, 1992-1998 and 1998-2004

	OLS	OLS	OLS	Median	Median	Median
Mex. Amer.	-.082***	-.067**	-.096**	-.039*	-.035	-.041
	(.032)	(.032)	(.038)	(.022)	(.023)	(.029)
Other Hisp.	.019	.032	.007	-.043	-.039	-.035
	(.037)	(.037)	(.042)	(.029)	(.030)	(.037)
Afr. Amer.	-.037**	-.024	-.017	-.009	-.008	-.000
	(.018)	(.019)	(.020)	(.014)	(.014)	(.016)
98-04'	.092***	.090***	.138***	.081***	.080***	.106***
	(.014)	(.014)	(.015)	(.011)	(.011)	(.012)
Constant	.044***	.022*	-5.937***	.076***	.073***	-4.992***
	(.009)	(.012)	(1.215)	(.008)	(.010)	(1.072)
Other controls	No	Income	Income + others	No	Income	Income + others
Adj. R-Square	.011	.012	.049			
Pseudo R-Square				.004	.004	.017
Observations	5,008	5,008	4,927	5,246	5,246	5,159

Notes. Specifications are the same as specifications used in Table 5. Robust standard errors (clustered at the family level) and trimmed samples are used for OLS regressions only.

Table 8: Passive Saving Rates excluding Social Security and Pensions, 1992-1998 and 1998-2004

	OLS	OLS	OLS	Median	Median	Median
Mex. Amer.	-.025	-.005	-.022	-.032**	-.001	.003
	(.029)	(.029)	(.034)	(.013)	(.011)	(.015)
Other Hisp.	.024	.042	.018	-.032*	-.000	.009
	(.033)	(.033)	(.042)	(.017)	(.014)	(.018)
Afr. Amer.	-.050***	-.033**	-.037**	-.032***	-.006	-.007
	(.015)	(.016)	(.017)	(.008)	(.007)	(.008)
98-04'	.057***	.054***	.059***	.008	.005	.013**
	(.014)	(.014)	(.014)	(.006)	(.005)	(.006)
Constant	.050***	.021*	.232	.032***	-.003	-.336
	(.009)	(.012)	(1.327)	(.005)	(.005)	(.534)
Other controls	No	Income	Income + others	No	Income	Income + others
Adj. R-Square	.005	.009	.009			
Pseudo R-Square				.002	.006	.007
Observations	5,029	5,029	4,944	5,246	5,246	5,159

Notes. Specifications are the same as specifications used in Table 5. Robust standard errors (clustered at the family level) and trimmed samples are used for OLS regressions only.

Table 9: Actual and expected inter vivos transfers and inheritances, by ethnicity and race

	Mexican Americans	Other Hispanics	African Americans	Whites
Number of respondents	1,619	912	4,779	18,510
Percent giving transfers of $500 or more:	25.0	33.6	33.9	46.3
Average transfers given:	174,697	449,670	455,006	316,033
Perceived probability of giving a transfer of	20.5	25.7	24.9	41.0
$5,000 or more over the next 10 years:	(30.4)	(34.7)	(32.7)	(35.0)
Percent receiving transfers of $500 or more:	10.2	9.2	11.3	5.8
Average transfers received:	1,371	1,560	1,270	1,480
Perceived probability of receiving a transfer of	11.7	14.1	15.3	11.2
$5,000 or more over the next 10 years:	(22.0)	(25.3)	(25.1)	(19.4)
Perceived probability of leaving an inheritance of	52.2	43.4	46.9	74.1
$10,000 or more:	(42.2)	(42.8)	(42.0)	(33.7)
Percent receiving inheritances:	0.7	0.7	0.9	6.0
Average inheritance received:	17,351	33,497	16,561	19,222
Perceived probability of receiving an inheritance	5.5	8.8	9.8	28.0
over the next 10 years:	(17.1)	(23.2)	(22.2)	(34.9)
Expected amount of the inheritance potentially	42,693	59,444	48,794	78,644
received:	(71,295)	(136,426)	(94,994)	(124,575)

Note: All transfers are to/from children, relatives and friends. Summary statistics are averages computed by pooling the data from waves 1 to 9 (survey years 1992 to 2008). Data for perceived probabilities finish in wave 8. Standard errors for perceived probabilities and expected amounts of inheritances are in parentheses. Sample consists of HRS households whose head and spouse were the same between at least two consecutive waves, the head was not retired during those years and was between 50 and 70 years old. Househods with mixed-ethnicity couples are excluded. The top and bottom 2 percent of total amounts reported was dropped to compute mean values. Actual mean values are conditioned on giving/receiving the transfer/inheritance and are in thousands of 2004 dollars. All data are weighted using the HRS household weights.

Table 10: Estimates of actual probabilities and amounts and perceived probabilities of giving/receiving transfers

	Give a Transfer			Receive a Transfer		
	Percent	Amount	Perceived Probab.	Percent	Amount	Perceived Probab.
	Probit	Tobit	Probit	Probit	Tobit	Probit
Mex. Amer.	-.14***	-105,306.72**	-.07***	.03***	-27.56	.01
	(.03)	(49,312.50)	(.02)	(.01)	(134.43)	(.01)
Other Hisp.	-.12***	30,660.94	-.10***	.01	38.80	.02*
	(.03)	(86,600.91)	(.03)	(.01)	(170.75)	(.01)
Afr. Amer.	-.02	34,559.02	-.03**	.03***	-104.51*	.03***
	(.01)	(30,787.97)	(.01)	(.01)	(62.32)	(.00)
Pseudo R-Square	.081	.002	.171	.062	.007	.035
Observations	20,755	8,309	18,698	20,760	969	18,189

Notes. The dependent variables in columns 3 and 6 (perceived probability) are binary indicators that take value one if the household reports a probability of 50 percent or more. Household data on perceived probabilities is the average of the probabilities reported by household respondents. All specifications also control for household income and its square, age of the head and its square, the number of children in the household, dummies for education of the head, whether the head was born in the US and whether is married, and state and year fixed-effects. Robust standard errors, clustered at the family level, are in parentheses. Samples exclude wave 9 (survey year 2008) for perceived probabilities. Samples for Tobit regressions are trimmed and limited to households with positive transfers.

Table 11: Estimates of actual probabilities and amounts and perceived probabilities of leaving/receiving inheritances

	Leave an Inheritance	Receive an Inheritance			
	Perceived Probab.	Percent	Amount	Perceived Probab.	Expected Amount
	Probit	Probit	Tobit	Probit	Tobit
Mex. Amer.	.01	-.04***	3,148.97	-.17***	-10,029.80
	(.022)	(.009)	(4,189.446)	(.025)	(7,447.400)
Other Hisp.	-.17***	-.06***	24,909.61***	-.11***	7,772.40
	(.037)	(.016)	(2,527.787)	(.028)	(13,572.822)
Afr. Amer.	-.12***	-.04***	-1,592.82	-.13***	-7,656.07***
	(.013)	(.004)	(2,392.596)	(.011)	(2,920.059)
Pseudo R-Square	.231	.089	.013	.140	.006
Observations	18,203	20,995	555	18,224	6,094

Notes. See note to Table 10 for description of the 'perceived probability' indicator. All specifications include the same controls as the ones described in the note to Table 10. Robust standard errors, clustered at the family level, are in parentheses. Samples exclude wave 9 (survey year 2008) for perceived probabilities. Samples for Tobit regressions are trimmed and limited to households with positive actual and expected inheritances.

Table 12: Fixed-effect estimates of total saving rates on perceived probabilities

	All the sample	Mexican Americans	Other Hispanics	African Americans	Whites
	FE	FE	FE	FE	FE
Give a Transfer	-0.027**	-0.073	0.156	-0.004	-0.030**
	(.013)	(.069)	(.111)	(.035)	(.015)
Adj. R-Squared	0.005	0.011	0.014	0.002	0.008
Observations	20,225	1,282	556	3,590	14,797
Receive a Transfer	0.046*	0.103	-0.118	0.071	0.035
	(.026)	(.092)	(.157)	(.048)	(.033)
Adj. R-Squared	0.005	0.003	0.012	0.004	0.007
Observations	19,806	1,219	539	3,437	14,611
Leave an Inheritance	-0.054***	-0.089*	-0.095	-0.014	-0.062***
	(.015)	(.050)	(.087)	(.035)	(.019)
Adj. R-Squared	0.007	0.011	0.011	0.006	0.01
Observations	16,407	1,038	452	2,823	12,094
Receive an Inheritance	0.021	-0.038	-0.030	-0.006	0.023
	(.018)	(.170)	(.219)	(.063)	(.019)
Adj. R-Squared	0.006	0.004	0.007	0.004	0.009
Observations	16,403	1,042	455	2,822	12,084

Notes. All specifications also control for household income and its square, age of the head and its square, the number of children in the household, dummies for education of the head, whether the head was born in the US and whether is married, and state and year fixed-effects. Robust standard errors, clustered at the family level, are in parentheses.

Table 13: Estimates of belief updating for the perceived probability of giving/receiving a transfer

	Give a Transfer		Receive a Transfer	
	OLS	FD IV	OLS	FD IV
Give a Transfer (perc. prob. in t-1)	.253***	.080***		
	(.009)	(.022)		
Give a Transfer (actual)	.165***	.094***		
	(.007)	(.014)		
Receive a Transfer (perc. prob. in t-1)			.184***	.072**
			(.019)	(.031)
Receive a Transfer (actual)			.134***	.074***
			(.013)	(.022)
Household Income/1,000,000	.416***	.081	-.029**	-.034
	(.077)	(.111)	(.012)	(.033)
Children Income/1,000,000	-.131***	-.254*	-.004	.076
	(.035)	(.136)	(.022)	(.075)
Constant	1.832***	.372	.100	.234
	(.439)	(1.460)	(.275)	(.765)
Adj. R-Square	.277		.067	
Observations	18,121	11,598	15,794	9,693

Notes. Estimates in columns "FD IV" are obtained using the two-step, Arellano-Bover/Blundell-Bond estimator. See note to Table 10 for description of the 'perceived probability' indicator. Children income was constructed by imputing the median value to the four intervals for which it was reported by their parents. All specifications control for age of the head and its square, the number of children in the household, and include dummies for the education of the head, whether is married and whether was born in the US. Year and region fixed-effects are also included. Robust standard errors are in parentheses (this is the Windmeijer (2005) WC-robust estimator for the two step-estimator).

Table 14: Two-stage least-squares first-differenced estimates of total saving rates

	All the sample	Mexican Americans	Other Hispanics	African Americans	Whites
	(1)	(2)	(3)	(4)	(5)
D.Give a Transfer (perc. prob. in t-1)	-.014	-.181	.079	.065	-.017
	(.049)	(.256)	(.279)	(.116)	(.056)
Constant	.099*	.215	.078	.207*	.062
	(.052)	(.247)	(.336)	(.126)	(.061)
R-squared	.009	.040	.087	.022	.012
Observations	5,822	300	120	908	4,494

Table 15: Two-stage least-squares first-differenced estimates of total saving rates

	All the sample	Mexican Americans	Other Hispanics	African Americans	Whites
	(1)	(2)	(3)	(4)	(5)
D.Receive a Transfer (perc. prob. in t-1)	.015	.128	-.374	.239	-.076
	(.082)	(.252)	(.524)	(.160)	(.104)
Constant	.096*	.067	-.045	.275**	.058
	(.053)	(.215)	(.314)	(.127)	(.062)
R-Squared	.009	.039	.114	.016	.010
Observations	5,635	282	121	836	4,396

Notes to Tables 14 and 15. Estimates are obtained using the 2SLS first-differenced estimator. The dependent variable is a binary indicator that takes value one if household savings between t-1 and t are positive. See the note to Table 10 for description of the 'perceived probability' indicator. All specifications control for permanent household income and its square, age of the head and its square, and time and region fixed-effects. Robust standard errors, clustered at the family level, are in parentheses.

Appendix

A Additional Tables

Table A1: Regressions of Total Saving Rate excluding Social Security and Pensions - Robustness of Standard Errors

	Mexican Americans	Other Hispanics	African Americans
Mean regressions	−0.049	0.002	−0.053
No correction	(0.027)*	(0.035)	(0.017)***
Cluster at household level (main)	(0.028)*	(0.029)	(0.014)***
Clustered-bootstrap	(0.028)*	(0.029)	(0.015)***
Observations	5,034	5,034	5,034
Median regressions	-0.029	-0.026	-0.029
No correction (main)	(0.015)*	(0.020)	(0.010)***
Bootstrapped	(0.009)***	(0.008)***	(0.007)***
Observations	5,246	5,246	5,246

Note: All regressions control for income and its square, and a dummy for years 1998-2004.

* p<0.10, **p<0.05, *** p<0.01

Table 2: Saving Rates on Real and Financial Assets, 1992-1998 and 1998-2004

	Real assets						Financial assets					
	OLS	OLS	OLS	Median	Median	Median	OLS	OLS	OLS	Median	Median	Median
Mex. Amer.	-.041*	-.030	-.043*	-.022***	-.009	-.015	-.045***	-.028***	-.007	-.018***	-.004	-.004
	(.021)	(.022)	(.025)	(.008)	(.008)	(.009)	(.008)	(.008)	(.012)	(.005)	(.005)	(.007)
Other Hisp.	.008	.017	.004	-.022**	-.009	-.011	-.038***	-.023**	.002	-.018***	-.003	-.001
	(.023)	(.023)	(.029)	(.010)	(.010)	(.012)	(.010)	(.010)	(.014)	(.006)	(.007)	(.009)
Afr. Amer.	-.029***	-.019*	-.022**	-.022***	-.010**	-.009*	-.045***	-.030***	-.017***	-.018***	-.005	-.004
	(.010)	(.010)	(.011)	(.005)	(.005)	(.005)	(.006)	(.006)	(.007)	(.003)	(.003)	(.004)
98-04'	.093***	.091***	.102***	.018***	.014***	.019***	-.020***	-.022***	-.027***	.000	-.003	-.005*
	(.009)	(.009)	(.010)	(.004)	(.004)	(.004)	(.006)	(.006)	(.007)	(.002)	(.002)	(.003)
Constant	.015**	-.002	-1.546*	.022***	.006*	-.383	.064***	.039***	-.521	.018***	.002	.031
	(.006)	(.008)	(.834)	(.003)	(.003)	(.341)	(.005)	(.006)	(.577)	(.002)	(.002)	(.250)
Other controls	No	Income	Income + others	No	Income	Income + others	No	Income	Income + others	No	Income	Income + others
Adj. R-Square	.022	.024	.027				.010	.024	.028			
Pseudo R-Square				.004	.006	.007				.004	.010	.011
Observations	5,022	5,022	4,937	5,246	5,246	5,159	5,049	5,049	4,964	5,246	5,246	5,159

Notes. For each column, the top headings indicate the saving measure used as dependent variable. See the note to Table 3 for definition of saving rates. The controls included are the same as the ones included in specifications (3) and (6). Robust standard errors (clustered at the family level) and trimmed samples are used for OLS regressions only.

Table A3: Oaxaca-Blinder decomposition

	Mexican Americans				African Americans			
	Level of wealth		Saving rate		Level of wealth		Saving rate	
Total gap	217,325***		.082***		232,732***		.080***	
	(11,846)		(.028)		(8,907)		(.014)	
Explained gap	136,918***	[63%]	0.025	[30%]	136,571***	[59%]	.040***	[50%]
	(15,771)		(.019)		(8,391)		(.007)	
Unexplained gap	80,407***	[37%]	.057*	[70%]	96,161***	[39%]	.040***	[50%]
	(16,320)		(.032)		(7,986)		(.016)	
Contributions to the explained gap by component								
Income	85,466***	[39%]	.014***	[17%]	75,563***	[32%]	.012***	[15%]
	(11,144)		(.004)		(9,881)		(.004)	
Education	45,339***	[21%]	0.012	[15%]	26,092***	[11%]	.008*	[10%]
	(6,782)		(.009)		(4,137)		(.005)	
Demographic characteristics	−2,169	[1%]	-0.009	[-11%]	19,654***	[8%]	0.001	[1%]
	(9,117)		(.012)		(4,248)		(.005)	
Health	12,235***	[6%]	.017***	[21%]	8,792***	[4%]	.013***	[16%]
	(3,394)		(.006)		(2,434)		(.004)	
Region of residence	−3,953	[-2%]	-0.009	[-11%]	6,470**	[3%]	0.005	[6%]
	(8,354)		(.012)		(2,723)		(.003)	

Standard errors in parentheses; percent of total variation in brackets.

**p<0.10, **p<0.05, ***p<0.001*

B Data description

I use household data from the Health and Retirement Study (HRS) for 1992-2004. In this appendix I describe in detail the construction of the variables used for the analysis.

1) Sample selection: Most of the data are taken from the 1992, 1998 and 2004 HRS waves, but I also rely on some data from intermediate waves to compute permanent income and active savings. Respondents in the HRS are defined as the age-eligible individuals (in 1992 the selected birth cohort aged 51-61) and the spouse, regardless of age, when the respondent is married. Spouses are included because retirement decisions are often taken jointly by the couple. Thus, at least two observations are present in households with married or partnered respondents: one for the primary respondent, the individual with more knowledge about assets, debts and retirement planning, and other for the secondary respondent, i.e. his/her spouse. Following the standard practice, I will treat the male in the couple, rather than the primary respondent, as the household head. The reason is that this facilitates comparison with other studies, and also there are more differences in characteristics affecting earnings behavior between men and women than between the primary and secondary respondent (Moon & Juster 1995).

Each individual defined as the household head constitutes one observation. The sample selection follows the typical restrictions adopted in the empirical literature on savings. Thus, I restrict the sample to sub-households with the same head over the relevant period (1992-1998 or 1998-2004) and to those where the head's spouse was the same, in case the head has a partner. This leaves 10,283 observations in 1992-1998 and 11,767 in 1998-2004. The purpose is to restrict the sample to stable households, where wealth changes are not explained mostly by changes in family composition. I also drop observations for sub-households that were in the sample but were not interviewed in a particular wave. This leaves a total of 5,548 observations for the analysis in 1992-1998 and 9,147 observations for 1998-2004. Sub-households that have either income or wealth missing were also dropped (only 10 households were dropped in 1998-2004). Next, I drop households where the head was below 50 or above 70 years old in 1998 and in 2004 (5,243 observations remaining for 1992-1998 and 4,618 for 1998-2004). Then I drop households where the head reports to be retired either in the first or in the last year of each period, which leaves 3,113 and 2,424 observations for 1992-1998 and for 1998-2004 respectively.[29] Finally, I exclude households where the spouses are of a different race or ethnicity and so the total number of observations falls to 2,953 in 1992-1998 and to 2,302 in 1998-2004. Finally, the sample was trimmed when necessary by dropping households in the top and bottom 2 percent of the corresponding distribution (details are given in each table's notes).

2) Weights: All summary statistics for 1992-1998 were obtained using the household level weights provided by the HRS for 1998. Results for 1998-2004 use the weights for 2004.

3) Constructed variables:

A. Total Saving: It is obtained as the difference between real net wealth in 1998 (2004) minus real net

[29] Note that retirement status can vary if instead of using self-reports one uses an objective measure such as "no current job". Gustman et al. (1995) show that self-reports result in significantly lower number of retirees than the use of objective measures. Thus, as a robustness check one can also define retired households as those where the head has no current job. They also note that the HRS allows capturing the flows from labor force to retirement and the other way around, resulting from the fact that retirement is not an absorbing state.

wealth in 1992 (1998). That measure can be decomposed into two components: active and passive savings. The measures of wealth levels (total and individual components) are taken from the RAND HRS 2008 Income and Wealth Imputations. Total net wealth comprises main home equity (the value of main house minus all mortgages in the primary residence and other home loans), real estate other than home equity, vehicles, business, Individual Retirement Accounts (IRAs), stocks, mutual funds, checking and savings accounts, CDs, savings bonds, treasury bills, bonds, and other assets (money owed by others, valuable collections, rights in a trust or estate) less other debts (credit card balances, medical debts, life insurance policy loans, loans from relatives). This measure of total wealth excludes pension and Social Security (S.S.), which are not directly reported in the survey. These variables were constructed ex-post using information collected in the 1992, 1998 and 2004 waves and it is possible to access to some of them through the HRS website. Here I use the pension and S.S. wealth measures that are publicly available and I add them to the measure of wealth in order to compute total wealth.

- Pension wealth: The procedure to construct this variable for 1992 and 1998 is described in the HRS document 'Imputations for Pension Wealth 1992 and 1998', and for 2004 in the document 'Imputations for Employer-Sponsored Pension Wealth from Current Jobs in 2004'. Pension wealth is estimated for current jobs from both self-reported and employer data. Using the respondent's self-reported pension plan type, it is possible to determine which method of wealth estimation to use.

i) If the respondent is covered by at least one DC plan on his current job at the time of the survey (1992, 1998 or 2004), DC wealth is computed from the self-reported account balance. Note that multiple accounts can be reported from the same job and in that case total DC wealth is the sum of each account balance from current job.

ii) If the respondent is covered by at least one DB plan at the time of the survey, the HRS Pension Estimation Program is used to compute wealth for each DB plan. This is done by combining self-reported data and pension plan rules obtained from the Summary Plan Description. SPDs were obtained by different means such as by contacting the employers of HRS respondents, by conducting an employer pension provider survey, by respondents' requests to their employers, by Internet searches and use of commercial databases. DB values were calculated at seven different ages: the expected age of retirement, early age of retirement, normal age of retirement, ages 60, 62, 65 and, only for 2004, age 70. The calculations of the present values from DB plans use the intermediate future real interest rate (2.9%) and the inflation rate (2.8%) forecast by the Social Security Administration (SSA). The present values are then discounted back to the survey year, which allows comparison between DB and DC amounts.

iii) If the respondent is covered by DB and DC plans or a Combination plan, both DB and DC wealth values are calculated.

Thus, total pension wealth is calculated by adding DB values at a given age of retirement (expected, early, normal, 60, 62, 65 or 70) and the total value of all the DC/Combination account balances in the corresponding survey year. Different imputations methods were used when the data needed for these estimates were missing. Since in 1992 and 1998 DB wealth is discounted back to the survey year only for the expected age of retirement, this is the only DB value I can use for 2004 as well.

- Social Security wealth: The methodology to construct this variable is described in the HRS document 'Prospective Social Security Wealth Measures of Pre-Retirees'. S.S. wealth is calculated for 'pre-retirement' respondents (i.e. those who are not claiming S.S. benefits as of the wave date) in 1992, 1998 and 2004.[30] First, this involves computing the Average Indexed Monthly Earning (AIME) and Primary Insurance Amount (PIA) for each respondent using the ANYPIA program (Office of the Actuary, v 2008.1). That program determines S.S. eligibility and coverage for each individual based on his/her earnings record. AIME is the average of the individual's highest indexed earnings over the appropriate number of 'computation years'. The PIA is the amount payable to the worker at the projected claim date in claim year dollars and it is a function of AIME and 'bend points'. Annual PIAs are calculated as of three claim ages: age 62, full retirement age (FRA) and age 70. To calculate survival probabilities, they use the SSA life tables by year of birth and sex. And the interest rates and the inflation rates are taken from the SSA Trustee Reports.

S.S. wealth is calculated on three monthly benefits: i) *retirement insurance benefits* (or old-age insurance benefits) are based on lifetime earnings, and are paid to retired workers age 62 or over who are fully insured ii) *incremental auxiliary spouse benefits*, is based on the spouse's life-time earnings and iii) *incremental survivor benefit*, is based on the deceased insured worker's lifetime earnings. Thus, wealth is computed by assuming that the monthly S.S. benefit comprises i) and ii) if both spouses are alive, whereas it comprises i) and iii) if one worker is deceased. By definition, ii) and iii) are zero for the higher earner. Adjustments are made on each period for early or late claiming, and these three components of S.S. wealth are weighted by the survival probabilities. The resulting wealth values are made comparable across individuals by reporting them in wave date dollars. Note that benefits are calculated assuming claiming ages that the respondent has not yet attained by the survey date (age 62, FRA, and age 70). If a respondent is older than a particular age claim or if he has started claiming benefits, missing values are assigned. Thus, for example, S.S. wealth at FRA is only calculated for individuals that are 67 or younger.

Thus, the variable measuring household total S.S. wealth, assuming both respondent and spouse claim at their respective FRA, is the sum of respondent's retirement insurance wealth, respondent's incremental auxiliary spouse benefit wealth, respondent's incremental survivor benefit wealth, spouse's incremental retirement insurance benefit wealth, spouse's incremental auxiliary spouse benefit wealth, and spouse's incremental survivor benefit wealth. As in the case of other wealth components, missing values were imputed when possible.

Ideally, to compute total wealth one would like to add S.S. and pension wealth assuming claiming at age 62 or at FRA (also called normal retirement age), which are the assumptions used to compute both pension and SS wealth for all the three waves. However, I can only use pension wealth at expected age of retirement for the reasons explained above. Thus, I decided to use S.S. wealth assuming claiming at age 70, since in that way I can have pension measures for people at older ages (recall that S.S. wealth take value zero when people has already reached the assumed claiming age, thus if I were using SS assuming claiming at 62 or FRA I will be underestimating S.S. wealth at older ages).

[30] This is the information in the files publicly available as of August 2012. Access to the S.S. wealth measures for current retirees has restricted access.

B. Active Saving: The specific measures of active savings are taken from the 'Assets and Income' and 'Asset change' modules, using the corresponding HRS imputations. Active savings using the HRS data can be defined as the sum of the following components:

. Active savings =

+ change in the value of housing*
+ net amount invested in real estate (excluding main home)*
+ change in the net value of vehicles
+ net amount invested in business*
+ net amount put into IRA or Keogh accounts*
+ net investment into stocks*
+ change in the value of cash assets
+ change in the net value of other assets
− change in the value of other debt

Some of the active savings components were measured by the HRS using explicit questions, such as the cost of home improvements, investment in real estate other than the primary residence, business, IRAs, and stocks.[31] Those questions were added in every wave, and so I added the values reported for each two-year period in order to get the total active savings between 1992 and 1998 and between 1998 and 2004. The remaining components were obtained as the difference in wealth between the six-years period, and so for them active savings are identical to total savings. Among the assets with no specific questions on active savings are S.S. and pensions, despite that capital gains may be significant especially in DC pension plans. Thus, in this case I opted for not distinguishing between active and passive savings to avoid overestimating the former. To my knowledge, this distinction for retirement assets has not been done in other studies of savings either, although one may be willing to distinguish between the change in wealth resulting from net new money put into these accounts and the change in wealth resulting from capital gains.

Active saving in housing is computed separately for households living in the same house and households moving between two consecutive waves, as in Juster et al. (2005). For the first group, active saving equals the cost of home improvements plus the change in the mortgage and other home loans if a family owned a house, and zero otherwise. When a family moves between two waves, active saving in housing is computed as the change in home equity. Thus, when a family does not move, the change in house value is imputed to capital gains, whereas for families that move between surveys all saving in housing -including the change in house value- is imputed to active saving.

Finally, note that the HRS also includes questions about net transfers into the household consisting on inflows and outflows resulting from changes in family composition and inheritances and gifts. In particular, 'assets and

[31] The components for which there are specific questions about active savings in the HRS are the ones marked with an asterisk.

debts brought in' and 'assets and debts moved out' capture the fact that, as individuals join the family, they may bring assets and debts with them and, as they leave, they may take assets and debts as well. In addition, active savings include inheritances and gifts from family and friends that are not savings out of income as in the traditional definition of savings. Since in general we don't know the type of assets associated to these flows, i.e. whether the household receives a car or a stock as a result of an inheritance or a new member join in, we cannot impute them correctly to active or passive savings. Following Juster et al. (2005), I do not include these net wealth transfers as part of either active nor passive savings.

C. **Passive Saving**: It only accounts for the capital gains of the assets for which the HRS has specific questions about active savings. Here I compute the aggregate measure of passive savings as the difference between the change in total net wealth during 1992-1998 (1998-2004) minus total active savings over the same period. Since both total and active saving are deflated as described in point 4) below, passive saving obtained as a residual are also in 2004 dollars.

D. **Income**: Income variables are taken from the same source as the wealth measures, that is, the RAND HRS 2008 Income and Wealth Imputations. The measure of total income computed from the HRS corresponds to the last calendar year and is the sum of respondent and spouse earnings, pensions and annuities, Supplemental Security Income and Social Security disability, Social Security retirement, unemployment and workers compensation and other government transfers, household capital income (includes business or farm income, self-employment earnings, gross rent, dividend and interest income, and other asset income), and other income and lump sums from insurance, pension, and inheritance. It was not possible to compute disposable income by subtracting taxes paid by the household members because the HRS does not collect information on taxes (with a few exceptions, such as taxes on real estate). Income is calculated for 1993-1997 by averaging data from the 1994, 1996 and 1998 waves, and for 1999-2003 by taking the mean of the following three waves (2000, 2002 and 2004).

In addition, to compute saving rates, it is necessary to adjust the measure of total income and account for employer contributions to pensions and S.S.. As Dynan et al. (2004) point out, these contributions are part of pension and SS saving but they are not included in the measure of total income described above. The HRS only asks about the employer contributions to DC plans. but not about contributions to DB plans nor to SS. In addition, self-reports on employer contributions are known to be typically measured with error, due mainly to the lack of knowledge of the respondent. Thus, I opted for using the Employer Costs for Employee Compensation (ECEC), produced by the Bureau of Labor Statistics. The ECEC measures the average cost to employers for wages, salaries and benefits, per employee hour worked. In particular, it provides the cost for DB and DC plans and for S.S. as percentages of total compensation. I use the average for the period 1992-2006 of these measures, computed separately for state and local government workers on the one hand, and private industry workers on the other. The percentages of total compensation are 6.2% for DB, 0.6% for DC, and 3.6% for SS in the case of workers in the public sector, and 1.5%, 1.6% and 4.8% respectively for the private sector. Thus, I adjust total household income by adding the fraction of the respondent and spouse earnings that correspond to employer contributions to DB and DC plans and to S.S..

E. Saving Rates: I compute total, active and passive saving rates as the ratio between the corresponding saving measure over 1992-1998 (1998-2004) and six times the average of total adjusted income over 1993-1997 (1999-2003).

F. Other variables:

- Age: Age is one of the key eligibility criteria for a household to be part of the HRS sample and so the unit of observation is the age-eligible respondent. Age of the household head is measured in 1995 for the period 1992-1998 and in 2001 for the period 1998-2004.

- Education: Education dummies were built by considering the highest degree of education of the household head. The dummies created are "no high school diploma" if the individual has no degree or a General Equivalence Degree (GED), "high school graduate" if the individual has a high school diploma and "college/postcollege graduate" if the individual has at least a two-year college degree.

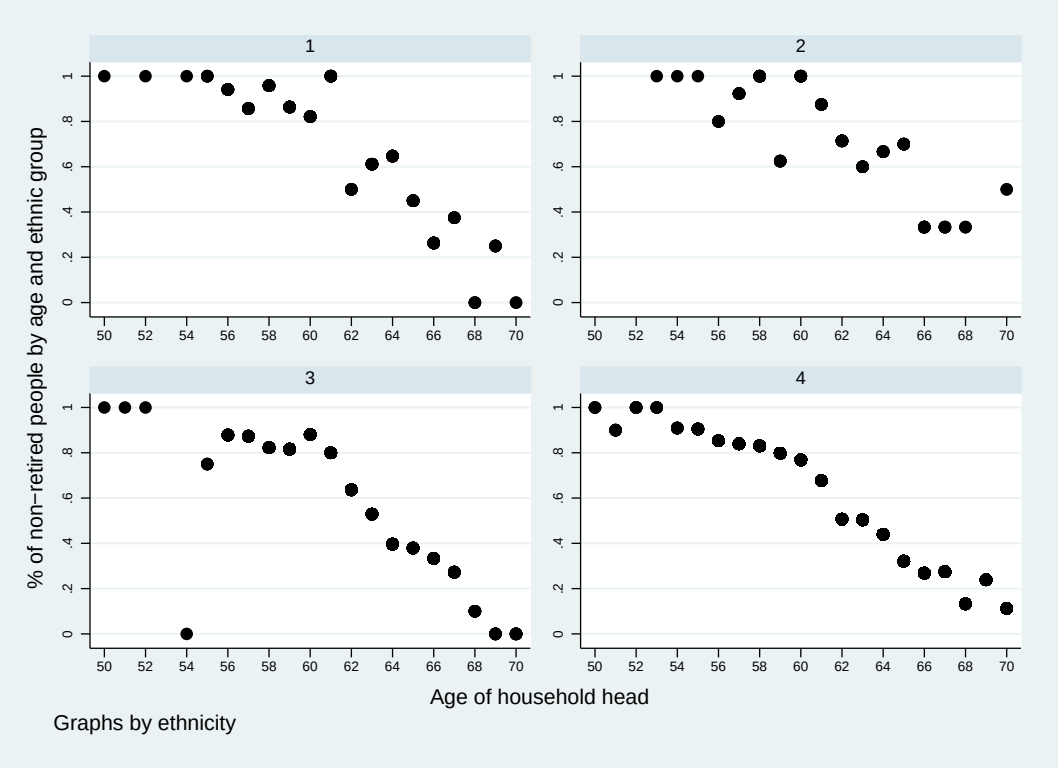
- Health status: The health indicator is constructed from a question where the respondent is asked to rate his/her health status as excellent, very good, good, fair, or poor. For each year, I compute an indicator that takes value one if they rate their health as excellent, very good or good, and zero otherwise. Then, I add the values coded for each wave, that is, for years 1992, 1994, 1996 and 1998 for the analysis in 1992-1998 and for years 1998, 2000, 2002 and 2004 for the period 1998-2004. Finally, I create a dummy for good health that takes value one if the sum of the four waves is greater or equal than 3 and zero otherwise.

4) Deflators: All variables are deflated using the NIPA implicit price deflator for personal consumption expenditures, with the base year adjusted to be 2004. The stock variables such as total wealth and its components and permanent income are deflated by dividing the correspondent balance by the price index for that year. Thus, the change in wealth is simply the difference of those variables in real terms. The flow variables used to compute active savings are deflated using the 2-year harmonic mean of the NIPA implicit price deflator for personal consumption. Then the real components over each 2-year period are added to obtain the 6-year active saving measure (for 1992-1998 and 1998-2004 separately).

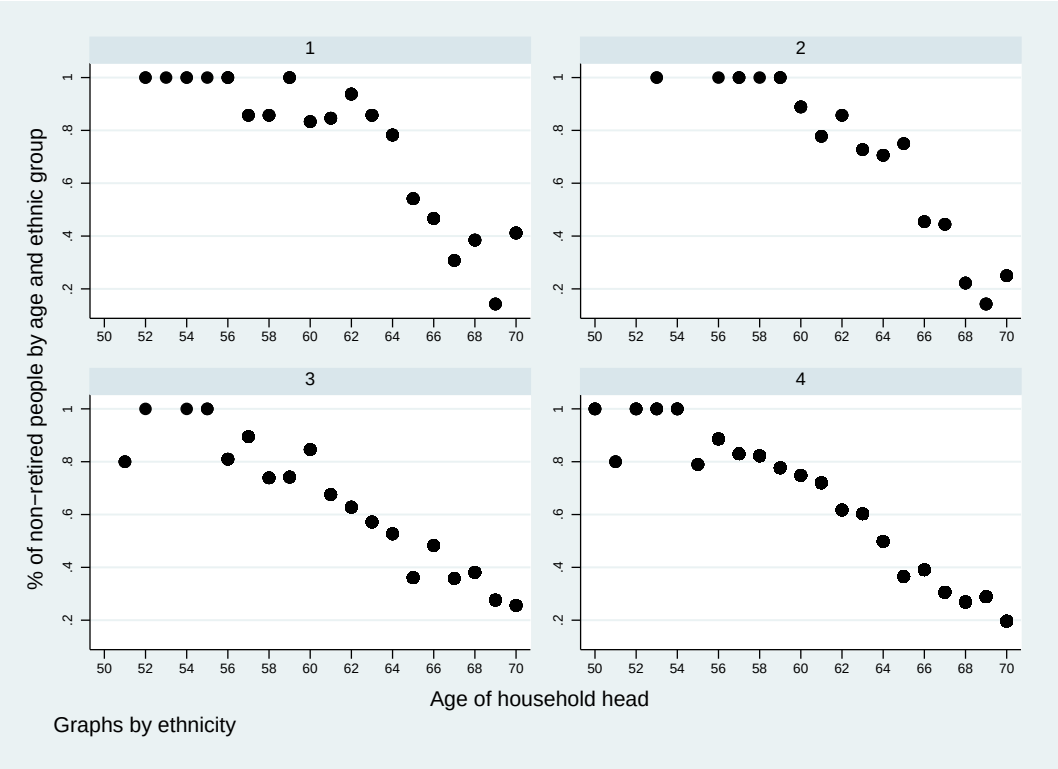
C Self-selection into retirement

Figures 4 and 5 show that the fraction of non-retired people decrease monotonically with age for Blacks and Whites. The proportion of Hispanics who are still working at each age and ethnic group is higher than than the proportion of Whites. Moreover, the pattern of decline is less monotonic than the pattern observed among Blacks and Whites. The density estimates of working people's age declines smoothly for whites after 55 years old in 1995 and after 60 years old in 2001. In contrast, the decline is less smooth for Mexican Americans and Other Hispanics in both periods. This reveals that there is some self-selection into retirement among Hispanics. They are more likely to continue working at older ages than Whites.

Figure 4: Proportion of non-retired households in 1992-1998 by age in 1998

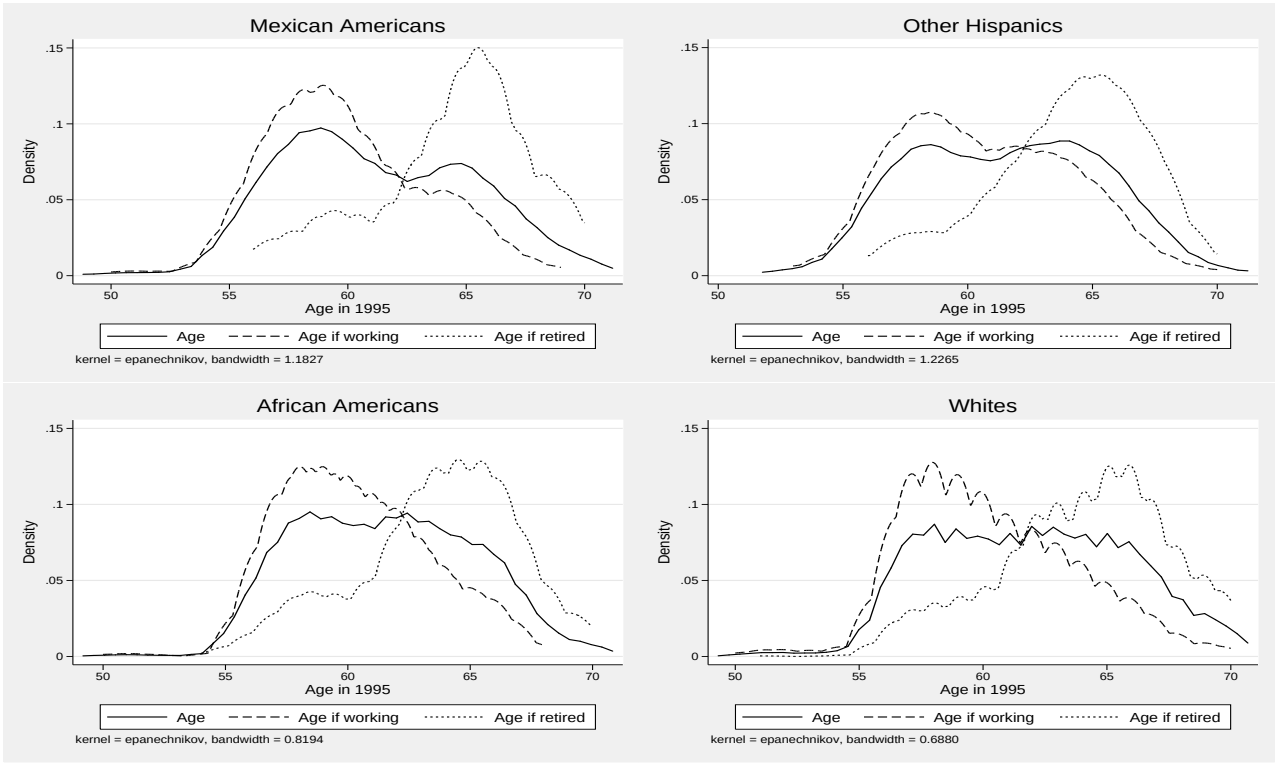


Proportion of non-retired households in 1998-2004 by age in 2004

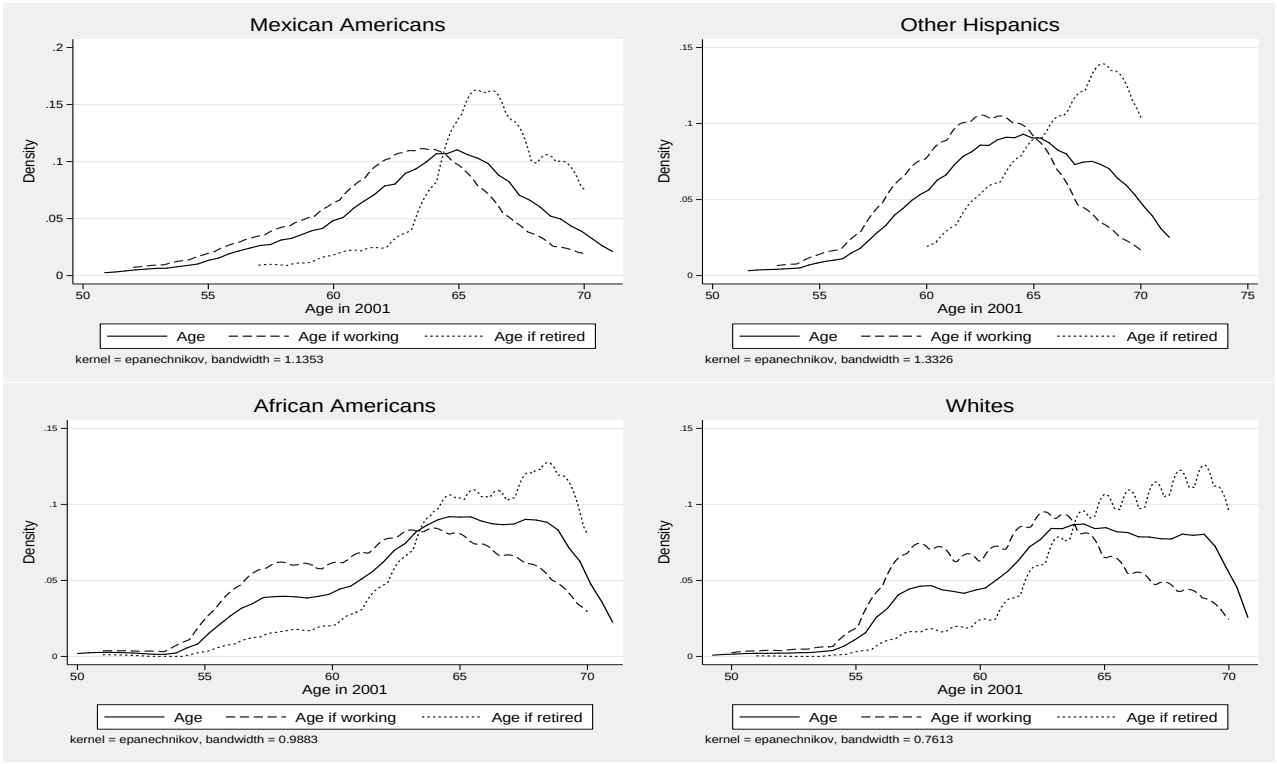


Note: Age corresponds to the age of the household head. Proportions are taken over the total number of individuals in the corresponding age and ethnic group. Sample consists of HRS households whose head and spouse were the same between 1998 and 2004 (upper panel) and between 1989 and 2004 (lower panel), the head was not retired during those years and was between 50 and 70 years old in 1998 (2004). Households with mixed-ethnicity couples are excluded. Non-retired households are those where the head does not report to be retired in both years.

Figure 5: Density estimates of age in 1998 by ethnicity and race



Density estimates of age in 2004 by ethnicity and race



Note: Age corresponds to the age of the household head. Sample consists of HRS households whose head and spouse were the same between 1998 and 2004 (upper panel) and between 1989 and 2004 (lower panel), the head was not retired during those years and was between 50 and 70 years old in 1998 (2004). House hods with mixed-ethnicity couples are excluded. Non-retired households are those where the head does not report to be retired in both years. Retired households are those where the head reports to be retired in at least one of those two years.