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Welfare Reform and Household Saving

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Abstract

In order to receive many forms of government assistance, a household's assets must be below the federal or state mandated limits. Recent theoretical work has shown that such means-tested welfare programs can explain the low levels of saving observed in the data for households with relatively low lifetime resources. In this paper, we use micro-level data from the Panel Study of Income Dynamics to examine the impact of new saving incentives that were implemented as part of the overhaul of U.S. welfare policy during the mid-1990s on the saving of households at risk of entering welfare. The Temporary Assistance for Needy Families program devolved responsibility of program rules to the states, and many states have responded by relaxing liquid asset and vehicle-equity limits that determine program eligibility, by introducing targeted Individual Development Accounts whose contributions do not count against program eligibility, and by introducing time limits on benefit receipt. According to the recent theoretical work and statements made by public officials, such policies are predicted to increase total savings for those households who have a large ex-ante probability of welfare receipt. Among those households with a high risk of entering welfare we find that increasing asset limits had a modest positive effect on liquid saving, and no effect on broader measures of saving; that liquid saving fell in states that removed their vehicle equity limits; and that IDAs had a positive, but small, impact on liquid saving. In general, though, there has been no near-term impact of welfare policy changes on the saving of those with only a moderate risk of facing welfare policies.

Welfare Reform and Household Saving

> "*Mr. Chairman, the welfare system in and of itself needs radical perestroika, restructuring; radical overhaul. .... Any asset is a violation of the welfare laws. We tell the American people we want you to save. We want you to be businessmen and women. We want you to go to work. But the welfare system in this socialist economy takes away the asset, the property, and, worst of all, takes away the incentive for getting out of poverty. It's a national disgrace.*"
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> --Jack Kemp, Secretary of Housing and Urban Development, Testimony to the Joint Economic Committee Hearing on The War on Poverty, November 19, 1991.

Saving is a critical part of a household's quest for self-sufficiency. If asset markets are incomplete, savings may be the only way for a household to get a down payment for home purchase, educate themselves or their children, move to a different neighborhood with better school systems, or smooth unforeseen contingencies such as medical emergencies or unemployment (Browning and Lusardi 1996; Sherraden 1991). However, it is well documented that asset accumulation by low-income American households is persistently low (Carney and Gale 1999; Charles and Hurst 2000; Hubbard et al. 1995; Hurst et al. 1998; Sherraden 1991). In 1994 over 90% of welfare recipients, over 80% of pre-retired households with children who have less than a high school education, and over 70% of pre-retired households with children who have just a high school education have less than $500 of accumulated non-pension financial liquid assets. Nearly half of low-income families had no non-pension financial liquid assets in either 1994 or 1999.[1]

A long-standing question faced by economists is "Why do the poor save so little?" If low-income households are relatively more impatient than high-income households or if low-income households are more likely to have time inconsistent preferences, the difference in time preferences could explain the differences in accumulated wealth between poor and other

[1] Authors' calculation using 1994 data from the Panel Study of Income Dynamics.

households, conditional on income (Lawrance 1991; Samwick 1997; Laibson 1997, Angeletos et al., 2001). Alternatively, by providing households with a consumption floor during times of temporary unemployment spells or subsidizing medical care when the household experiences a health shock, governmental welfare policies could reduce the household's income uncertainty and thus reduce their need to save for precautionary reasons irrespective of discount rates (Hubbard et al. 1995; Gruber and Yelowitz 1999; Neumark and Powers 1998; Ziliak 2001). The high replacement rate of income provided by Social Security for low lifetime-income households can reduce their need to save for lifecycle reasons. Aside from decreasing precautionary or lifecycle motives to save, government welfare policies may have additional 'direct' effects on household saving incentives. In order to receive many forms of government assistance, households may not have accumulated assets above the federal or state mandated limits. A recent, influential study by Hubbard, Skinner, and Zeldes (1995) has shown that such means-tested welfare programs can explain the low levels of saving observed in the data for households with relatively few lifetime resources.

Are welfare asset limits a binding constraint to poor households as suggested by Hubbard et al. (1995) and by prominent policy makers such as Secretary Kemp? In this paper, we take advantage of differences in recent welfare reform policies across states to shed new light on the saving behavior of low-income families. The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 represents a fundamental change in the delivery of cash welfare to program participants. PRWORA transformed Aid to Families with Dependent Children (AFDC) from an entitlement program that provided cash benefits to those households who satisfied state and federal eligibility standards into a work-based program called Temporary Assistance for Needy Families (TANF) that is almost exclusively controlled by the states.

Funding for TANF is provided by a block grant from the federal government that is tied to the states AFDC expenditure level in 1992–1995, but states are able to exert great discretion over program rules.

In response to PRWORA many states are attempting to reverse the fortunes of the poor and to stimulate saving by loosening limits on liquid-asset and vehicle wealth holdings, by adopting Individual Development Accounts (IDAs) whose contributions do not count against program eligibility, and by adopting time limits on benefit receipt, which is likely to affect precautionary motives to save. There are large differences across states in the extent that they tried to stimulate saving by changing asset limits, establishing IDAs, and reducing time limits. Testing the impact of these policy changes on saving is important both from a program evaluation perspective and because they provide additional evidence on the extent to which the theoretical predictions of Hubbard et al. (1995) are borne out in the data.

Using data from the Panel Study of Income Dynamics, including information from the 1989, 1994 and 1999 wealth supplements, we assess the extent to which saving responded to the state level changes in savings incentives associated with welfare reform. Because it is not only actual welfare recipients who are impacted by changes in welfare policy but also potential recipients, we conduct our tests on a variety of samples to reflect the possibility that it might be households with a moderate risk of entering welfare, as well as those with a high risk, who respond to changing incentives in the welfare programs. Among households with a large probability of welfare receipt we find that increasing asset limits had a modest positive effect on liquid saving, ranging from a $0.09 to $0.17 response in saving to a dollar increase in state imposed asset limits, but no effect on broader measures of saving. We also find that liquid saving among these households fell in states that removed their vehicle equity limits. Moreover, the

introduction of IDAs increased liquid saving, but the initial response has been small, upwards of $140 over a three-year period. While higher asset limits had no impact overall on the liquid saving of households at moderate risk of welfare receipt, there is some evidence of dissaving among these households with initial 1994 assets above the new post-PRWORA limits. Overall, the near-term saving of the so-called 'near poor' has not responded to the large changes in incentives offered through the recent welfare reform.

II. Background

TANF, like AFDC, is a means-tested program in which eligibility is determined by passing a sequence of asset tests as well as gross and net-income tests (along with the requirement that dependent children under age 18 be present in the household). The income tests under AFDC were based on a state's need standard, i.e. gross income was not permitted to exceed 185 percent of the state's need standard. These income tests are no longer a requirement under federal TANF rules, and most states have altered the AFDC program rules (TANF Report to Congress 1998).[2]

A. Asset Limits

States were given some latitude in setting real property and vehicle asset limits used in determining benefit eligibility under AFDC.[3] Indeed, prior to the Omnibus Budget Reconciliation Act of 1981, there was substantial state-specific heterogeneity in asset limits, but by 1984 only five states had vehicle limits below the allowable federal maximum of $1500, and nine states had

[2] Under AFDC, two-parent families were eligible for benefits only if the children were deprived of support due to incapacitation of a parent or because of the un(under)employment of the principal wage earner. As of federal fiscal year 1998, however, 37 states treat single and two-parent households identically for eligibility purposes, 8 states retained all three original rules, and the remaining states retained some of the restrictions and/or modified the original rules (Gallagher et al. 1998).

[3] Many AFDC/TANF recipients also receive Food Stamp benefits. However, unlike TANF, the Food Stamp program is administered at the national level. In terms of welfare policy, AFDC/TANF imposes one set of asset limits on its recipients and the Food Stamp program places a potentially different set of asset limits on its recipients. In Section V, we control for the interaction of different welfare policy asset limits on household saving.

non-housing, non-burial personal property limits below the federal maximum of $1000. By 1994, all states but one had their asset limits set equal to the federal maximum. However, under TANF, most states have broke ranks with the more restrictive AFDC rules and have altered their asset limits. Specifically, by federal fiscal year 1998 thirty-seven states had increased the liquid-asset limit above the previous 1994 limit of $1000 and forty-seven states had increased the vehicle exemption limit above the previous 1994 limit of $1500 (Gallagher et al. 1998; TANF Report to Congress 1998). In Appendix Table 1, we summarize the changes in liquid-asset limits and vehicle-equity limits for the typical TANF recipient relative to the previous federal maximum limit.

Theoretically, the effect on *aggregate* household saving of increasing the asset limit is ambiguous (Ashenfelter 1983; Hubbard et al. 1995; Powers 1998). A higher asset limit is expected to increase savings for those households who have a large ex-ante probability of welfare receipt and for whom the current constraint is binding. At the same time, those households with assets sufficiently above the original asset limits, but not too much above the new limits, might find the program more attractive with the higher limits and may reduce wealth in order to qualify. The net effect on total saving thus depends on the strength of the negative behavioral reaction by the so-called 'near poor' to the higher asset limits.

Perhaps surprisingly, there has been little research on the effect of assets limits on household saving. The survey of transfer programs by Danziger et al. (1981) discusses the impact of social security on private saving, but not the effect of welfare programs, while the more recent income-transfer survey by Moffitt (1992) is silent altogether on the saving decision. Recently, Hubbard et al. (1995) investigated the implications of asset-based means testing in a life-cycle simulation model of saving with earnings uncertainty and out-of-pocket medical expenditures.

Their simulations suggest that low-income households are better off by not engaging in significant saving due to the asset tests. Hubbard et al. argue that the existence of asset limits on government sponsored welfare programs, coupled with the consumption floor of benefits, can explain the low levels of asset accumulation observed in the data for poor and near poor households.

To our knowledge, Powers (1998) offers the only formal empirical test of asset limits on private saving.[4] She studied how changes in the net wealth of 229 female heads of household in the National Longitudinal Survey of Young Women responded to the homogenization of cross-state asset limits after passage of the Omnibus Budget Reconciliation Act of 1981. Her preferred estimate is that saving between 1978 and 1983 decreased by $0.25 for each $1 decrease in the asset limit in 1981. We offer new and improved estimates of the impact of asset limits on household saving; new because this is the first study to exploit the most comprehensive overhaul in welfare policy and its impact on saving; improved because we use a more comprehensive survey of wealth along with alternative definitions of wealth than net worth, broader definitions of those likely to be affected by welfare policies than female heads, and controls for program interactions and possible nonrandom differences between savers and those who persistently hold zero wealth. We expand on these differences in the sections to follow.

B. Time Limits

Under AFDC, recipients remained eligible for benefits so long as they met program eligibility rules. However, PRWORA fundamentally changed the provision of benefits by imposing a lifetime limit on benefit receipt. This provision was a culmination of waivers from federal rules that were implemented in several states in the mid 1990s. Because the limit may be

[4] Gruber and Yelowitz (1999) also study the impact of asset limits on private saving and find evidence consistent with Powers (1998). Their analysis is less direct than Powers (1998) because the impact of asset limits is identified off an interaction between states with asset limits and changes in Medicaid coverage.

lowered at state discretion, nineteen states have opted to lower the time limits below the sixty-month federal maximum. Four states (California, Maryland, New York, and Rhode Island) have opted to provide a reduced benefit to the family or children after the sixty-month time limit is reached, while Michigan has opted out of terminal time limits altogether and will provide the full benefit out of state funds after the federal limit is reached. States are permitted to exempt up to twenty percent of their caseload from the time limits for any reason. Appendix Table 2 provides a summary of state time limits.

The introduction of time limits is one of the more controversial policies in the current round of welfare reform and thus has received considerable attention (Duncan et al. 1997; Grogger and Michalopoulos 1999; Moffitt and Pavetti 2000; Pavetti 1995; Ziliak et al. 2000). Duncan et al. (1997) estimate that if behavior does not change, upwards of 23 percent of the current caseload (based on recipients on AFDC in the *PSID*) will hit the five-year time limit in exactly five years, while 41 percent will reach the five-year limit within eight years. However, many expect the behavior of welfare recipients to change in the face of time limits, and attention is now turning to predicting and estimating the behavioral responses to time limits. Moffitt and Pavetti (2000) appeal to the large literature on Unemployment Insurance (UI), a program that imposes an annual 26-week time limit, to assist in predicting the response of welfare recipients to time limits. The UI literature predicts that as the welfare time limit approaches the recipient's reservation wage falls and thus the rate of exit from TANF should increase. If, however, welfare recipients are myopic (or if they perceive that a job is readily available due to tight labor markets) then they may delay exit until full benefit exhaustion.

Grogger and Michalopoulos (1999) examine the impact of time limits within the context of a dynamic optimization framework. Their model predicts that time limits lead to the "hoarding"

of benefits based on the age of the youngest child, i.e. the younger the child the more likely is the household to delay use of benefits in order to still have access to the benefits later in the child's life. Another interpretation of the Grogger and Michalopoulos (1999) result is that the presence of time limits reduces the lifetime value of the consumption floor offered by welfare and therefore increases income uncertainty. All else equal, higher income uncertainty should increase household saving if households have precautionary saving motives (Hubbard et al. 1995; Carroll and Samwick 1998). In other words, time limits should increase saving both in the form of "hoarding" of benefits as well as in the form of non-welfare saving because lifetime income is more uncertain.

There is scant evidence to date on the impact of time limits on economic well being largely due to the recent implementation of the policy. Ziliak et al. (2000) and Grogger and Michalopoulos (1999) each find that time limits significantly reduce welfare caseloads, but it is not possible to make general inferences about overall well being from caseload declines. In this study we narrow this gap in knowledge by estimating the impact of time limits on household saving. Even though only a small subset of the sample members will be facing a binding time limit as of the 1999 *PSID* survey, time limits were an integral part of state-level waiver experiments in the mid-1990s and thus we exploit this cross-sectional variation. Moreover, since time limits affect lifetime income and income uncertainty, there should not only be a long-run impact, but also a short-run impact of time limits on household saving which our econometric model will attempt to identify.

C. Individual Development Accounts

In a nod to recent federal tax policy that has attempted to stimulate private saving through the formation of Individual Retirement Accounts (IRAs), PRWORA gave states the authority to

use TANF funds to create Individual Development Accounts (IDAs).[5] The IDAs allow recipients to contribute earned income to a savings account to be used for certain specified purposes as determined by the state, such as post-secondary education, home ownership, and business capitalization. Importantly, saving in this account does not count toward the state's asset limit used in determining benefit eligibility. Moreover, some states offer matching contribution programs up to rates of 3 to 1, with the matching funds frequently arising out of TANF resources (Center for Social Development 2000). In response to the new rules, by the 1998 federal fiscal year twenty-seven states passed legislation establishing IDA accounts for TANF participants and/or low-income citizens and twenty-three states had IDA programs in operation. This information is summarized in Appendix Table 3.

The introduction of IDAs is a substantial innovation to the nation's major cash-welfare system, and advocates (e.g. National Governor's Association 1997; Sherraden 1991) of the new policy tool argue that it will provide sorely needed stimulus to low-income household's ability to achieve economic independence.[6] Because saving in the IDA does not count toward the asset limit, theory suggests that the program should lead to an increase in household saving. Additionally, given that households in states offering matching programs can earn a higher return on their saving, there are additional reasons to believe household saving would respond positively to the establishment of IDAs.[7]

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[5] While PRWORA provided official sanctioning of IDAs, sixteen states began experimenting with the policy prior to passage of PRWORA through waivers from federal rules in the mid-1990's (National Governor's Association 1997).

[6] Indeed, to the extent that human capital accumulation is viewed as another form of saving, IDAs are unique in the nexus of welfare policy in that savings in this account can be used for education and training purposes.

[7] This positive impact as a result of matching assumes that the substitution effect dominates the income effect that results from the fact that a given overall return requires a lower contribution on the part of the participant. In our empirical model we do not incorporate information on IDA matching due to the relatively few states with such programs in place.

To our knowledge, this study offers the first assessment of the impact of IDAs on household saving using national survey data. The Center for Social Development (Sherraden et al. 2000; Schreiner et al. 2001) is in the third phase of evaluation of the "American Dream Demonstration," or ADD, which is a nationwide demonstration of 14 IDA sites that is scheduled to run from 1997–2001. By the end of the second wave with just over 2,800 ADD participants they found that the average ADD participant is saving on net around $25 per month or $300 annually. However, this need not represent a net increase in total household saving; households could simply be transferring savings from other assets towards IDAs. This paper, while complementing the ADD project, is advantageous because it is based on changes in pre- and post-PRWORA wealth levels, which should provide more precise identification of the impact of IDAs on total household saving.

At the same time, there are a few issues associated with the fact that IDAs are a new program that may make the empirical evaluation of this program difficult to ascertain at this early stage. Even if a state has adopted and implemented an IDA program by 1998, that program may not be offered uniformly throughout the state. Many states are conducting smaller-scale IDA programs in only a few counties or metropolitan areas throughout the state. After evaluating the success of these 'pilot' programs, states may offer the IDA program more universally. Furthermore, unlike traditional welfare programs, households may be less familiar with IDA programs, implying that take-up rates might be low initially and that a longer time window may be necessary to study their economic impact. As a result, we interpret our results cautiously.

D. Change in Benefits

During this same time period, around 40 percent of the states altered the amount of benefits for those on welfare. While most of the changes were positive, five states opted to reduce

nominal benefits and those who increased benefits did so only modestly. Indeed, the typical outcome was for states to continue their long-term trend of fixing nominal benefits and permitting inflation to erode the purchasing power of welfare recipients. In Appendix Table 4 we present the maximum state AFDC/TANF benefits for the three-person family in 1994 and 1999.

The maximum welfare benefit can be viewed as the generosity of the consumption floor. By providing a consumption floor, the government buffers household consumption for those periods when income is below more permanent levels. Of course, holding the benefit reduction rate constant, a higher maximum benefit implies higher-income (saving) households are categorically eligible for welfare benefits. However, the floor is also likely to reduce total income uncertainty and thus precautionary motives to save (Ziliak 2001). Consequently, higher floor levels and higher (positive) changes in floors are possibly associated with lower saving, all else equal. Our empirical model below tests whether more generous welfare floors (i.e. the combined AFDC/Food Stamp benefit for a three-person family) led to lower household saving.

III. Data and Descriptive Analysis

The data come from the University of Michigan's Panel Study of Income Dynamics (*PSID*) for the years 1989-1999. The *PSID* began in 1968 with 4,802 households and over 18,000 individuals and by the 1994 wave had nearly 8,500 families and over 50,000 individuals. Of the initial 4,802 households, 2,930 were selected from the Survey Research Center's random sample of the U.S. population, while the remaining 1,872 families were drawn from the Survey of Economic Opportunity's sample of the low-income population. The latter sample feature makes the *PSID* a valuable tool for the study of U.S. welfare programs. Starting in 1968, the *PSID* has re-interviewed individuals from those households every year—adults have been followed as they have grown older, and children have been observed as they advance through childhood and into

adulthood. The main focus of the *PSID*'s data collection efforts is on economic and demographic characteristics, especially with respect to earned and unearned income (welfare as well as asset income), employment, family composition, and geographic location.

For the purpose of this study, a key feature of the *PSID* is the wealth supplements collected in 1989, 1994, and 1999. Funded by grants through the National Institute on Aging, the wealth supplements contain comprehensive data on net worth, defined as liquid assets (checking accounts, savings accounts, CDs, IRAs, bond and stock values), the value of business equity, real estate equity, and vehicle equity, less any outstanding debts. The *PSID* wealth data compares favorably with other, more targeted, wealth surveys such as the Survey of Consumer Finances (Curtin et al. 1989; Juster et al. 1999), with the added feature that because low-income households are over-sampled we get a more detailed picture of saving among actual and potential welfare recipients.

A final consideration regarding the data involves sample composition. Because we are looking at the change in welfare laws over the mid-1990s, we restrict our analysis to households who were in the sample continuously between 1994 and 1999. Additionally, we did not want to confound the saving decision with that of retirement. As a result, we only included households in our sample who were between the ages of 20 and 60 in 1997. These restrictions left us with a sample of 3,408 households.[8] Presumably high-income (and/or wealth) households are unlikely to be affected by changes in welfare policy and thus may not offer useful identifying information.[9]

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[8] As of this time the demographic and income information from the 1999 *PSID* family file has not been released; thus, our demographic and information ends with the 1997 survey (although, we do have wealth data from the 1999 survey). In addition, the 1994 - 1997 demographic data (as well as the 1999 wealth data) are early release files. As noted by the PSID staff, there appears to be substantial missing values for the 1995 *early-release* income data. In response to this, our measures of average household labor income span only the years 1994, 1996, and 1997.

[9] Indeed, in results not tabulated we estimated our models below for a sample of high-income households and found that welfare policy had no impact on their saving.

Consequently, we further restrict our sample by only looking at married and unmarried heads-of-households who are likely to be affected by welfare policy.[10]

To this end, one method of selecting a sample that is most likely to respond to changes in welfare policy involves choosing only those households who actually receive welfare during the sample period. As take-up rates in AFDC were estimated to be around 70 percent (Blank and Ruggles 1996), this sample will miss eligible nonparticipants. Moreover, because participation in TANF is asset conditioned, this sample is likely to be endogenously selected. Furthermore, Hubbard et al. (1995) emphasize that this selection method misses an important group of households who are potentially affected by welfare policy—the near poor. The near poor are identified as those households who do not currently qualify for TANF (at least in terms of income), but who are at-risk of entering welfare because they face sufficiently high income uncertainty that they are compelled to hold few assets in order to qualify should they experience a negative income shock.

For our main samples of analysis, we segment PSID households as being at 'high risk of welfare use' or 'moderate risk of welfare use' using the household's predicted probability of AFDC/TANF receipt (Ziliak 2001). Using baseline controls for household age, education, race, and family structure, along with economic and political characteristics from the state where the household resides, we predict the likelihood that a household will take up TANF.[11,12] Households

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[10] Additionally, because of the extreme skewness associated with household wealth, we further restrict our analysis by truncating households at the 5th and 95th percentile of the liquid-saving distribution. The results below are robust to small changes in the truncation points, but failure to trim wealth changes leaves us susceptible to spurious welfare-policy effects whereas excessive trimming reduces sample variation in saving to make welfare-policy effects zero.

[11] For simplicity, we to refer to the predicted probability of AFDC/TANF receipt as simply the predicted probability of TANF receipt.

[12] To compute the predicted probability of TANF participation we ran a probit regression on a sample of households in the *PSID* continuously between 1994 and 1997 with the dependent variable equal to 1 if the household participated in TANF during any of the years between 1994 and 1997, and the regressors are measured at the baseline year of 1994. This regression included 3,941 households and had a pseudo R-squared of 0.419. Results of this regression are

with a high probability of TANF receipt (greater than the 85th percentile of fitted probabilities) are designated as high risk. The moderate risk households are defined as those with a predicted probability of TANF receipt between the 70th and 85th percentiles.

For robustness purposes, we construct several other samples of high and moderate welfare-risk households. Similar to Hubbard et al. (1995), we consider education level as a measure of risk of welfare use such that households with less than a high-school education are taken to be at high risk of entering welfare and high-school graduates with no college are assumed to be at moderate risk. Other samples of high-risk households include 1) actual TANF recipients, 2) those households whose three-year average family labor income (the average of 1994, 1996, and 1997 family labor income in 1996 dollars) is less than the 1996 poverty threshold for the respective household size, 3) those households whose average family labor income is less than half the median average income, and 4) those households whose heads have less than a high school degree. Alternative households at moderate risk of welfare use are those whose three-year average family labor income is between 100 and 200 percent of the 1996 poverty threshold for the respective household size, as those households whose average family labor income is between half the median and median average income, and as those households whose heads have a high school diploma (but no college education). Descriptive statistics for the alternate samples of high and moderate risk households are presented in Appendix Tables 6 and 7.

Aside from the *PSID*, which contains all pertinent demographic information, the other data needed are information on state-specific welfare policy variables, i.e. liquid- and vehicle-asset limits, IDAs, time limits, and consumption floors. The data for these variables come from the

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shown in Appendix Table 5. Our results are not sensitive to reasonable changes in the cutoff in predicted probability of welfare receipt. The 85th percentile had a predicted probability of AFDC participation of 0.174. The 70th percentile was 0.050 and the median predicted probability was 0.013.

Center for Social Development (2000), Gallagher et al. (1998), Crouse (1999), TANF Report to Congress (1998), and various issues of the Committee on Ways and Means *Green Book*. The program data are readily linked to the *PSID* data via state identifiers. All income and wealth data are converted into 1996 dollars using the corresponding seasonally adjusted June CPI-U.

A. Descriptive Analysis

We begin our descriptive analysis by comparing the group most directly affected by welfare policies—actual welfare recipients—with our predicted samples of high and moderate risk of welfare receipt. In the first two columns of Table 1, we present summary statistics on selected demographics for a group of households who received TANF and/or Food Stamp benefits in any year from 1994–1997. In the second two columns, we present the same summary statistics for our predicted welfare households.

By and large, TANF serves as a cash assistance program for single, female-headed, low-educated, minority households.[13] The descriptive statistics of the combined TANF and Food Stamp group are similar to those reported for the TANF group alone, though they do differ importantly in terms of mean income and fraction married. Nearly 90 percent of the TANF recipients also received Food Stamp benefits. This overlap between TANF receipt and Food Stamp participation will prove to be important in our empirical analysis because while many states lifted their liquid asset limits in the mid-1990s, Food Stamps maintained its $2000 asset limit. From Table 1 we see that in general the demographics of our sample of high-risk

[13] The summary statistics reported in Tables 1 and 2 are weighted using 1994 *PSID* weights. Given that the *PSID* over-samples minority households, weighting the data decreases the proportion of minority households on AFDC in the sample. There are some households with a zero family weight such that the weighted sample is smaller than the unweighted sample utilized in the regressions. The case for weighting the regression models is less strong given we control for those primary factors that determine the differential weights—income, race, and family structure. Omitting the zero-weight families from the sample has no substantive qualitative impact on the results but it raises the standard errors.

Table 1: Selected Demographic Characteristics for Actual and Potential Welfare Households in 1994

	AFDC/ TANF	AFDC and/or Food Stamps	High Risk of Welfare Use	Moderate Risk of Welfare Use
Age of Head '94	32.6	34.9	31.9	33.7
	(8.7)	(9.5)	(8.0)	(10.0)
Average Labor Income '94-'97	6,576	11,104	12,828	24,962
	(8,839)	(12,502)	(12,650)	(18,135)
Percent Married '94	0.156	0.239	0.050	0.284
	(0.363)	(0.427)	(0.217)	(0.451)
Percent Black '94	0.561	0.467	0.589	0.301
	(0.497)	(0.499)	(0.492)	(0.459)
Number of Children '94	1.84	1.61	1.87	1.12
	(1.24)	(1.32)	(1.30)	(1.34)
Percent Female Heads '94	0.777	0.611	0.918	0.486
	(0.417)	(0.489)	(0.274)	(0.500)
Percent < High School '94	0.431	0.388	0.415	0.224
	(0.496)	(0.488)	(0.493)	(0.418)
Percent High School '94	0.395	0.463	0.441	0.500
	(0.489)	(0.499)	(0.497)	(0.501)
Percent Some College '94	0.170	0.132	0.132	0.267
	(0.377)	(0.338)	(0.340)	(0.443)
Percent College '94	0.004	0.017	0.011	0.009
	(0.064)	(0.129)	(0.104)	(0.093)
Number of Observations	291	626	515	504

NOTE: The table presents weighted means and standard deviations in parentheses. See text for details about definitions of the sample splits. The subsamples pertain either to those households whose head actually participated in AFDC/TANF and/or Food Stamps at any time between 1994 and 1997, or were predicted to be at high risk of entering AFDC/TANF (>= 85th percentile) or at moderate risk (70–85th percentiles). Each subsample requires the household head to be the same from 1994–1999, the age of the head to be between 20 and 60 in 1997, the change in liquid saving to be between the 5th and 95th percentiles, and the level of 1994 liquid assets to be less than or equal to the 95th percentile. Income is in 1996 dollars.

households based on the predicted probability of welfare receipt mimics actual TANF recipients, although the former are much more likely to be female headed and to have higher income.[14] Lastly, there are substantial differences between the high and moderate risk of welfare households as the moderate risk have incomes about double the high-risk households, they are more likely to be married and to be white, and they are much more likely to have some college education.

In Table 2 we provide a detailed description of the wealth position of the predicted welfare households in our sample. Specifically, we document the median, the standard deviation (from the mean), and the interquartile range (i.e. the difference between the 75th and the 25th percentiles of the distribution) for the 1994 levels and 1994–1999 changes in liquid assets, vehicle equity, and net worth. In addition, we provide summary statistics on the fraction of households with no change in wealth position, the fraction with no assets in either period, and the fraction whose assets fall below the state-specific asset limit.

Table 2 reveals that the actual wealth holdings of households at high risk of welfare are strikingly low—the median levels of and changes in liquid assets, vehicle equity, and net worth are zero. Likewise the interquartile range is narrow, ranging from $105 for the level of liquid assets in 1994 to just over $6300 for net worth. Moreover, nearly one half of the high-risk households had zero wealth in both 1994 and 1999, and upwards of one quarter had no vehicle equity in both periods. While the moderate risk of welfare households hold higher levels of wealth, their overall asset position is likewise low. To wit, the median level of liquid assets in 1994 was $291 with an interquartile range of $1695. Moreover, the median change in liquid assets was zero, while the median change in net worth was $1903.

[14] The distribution of marital status among our predicted high-risk sample more closely resembles the national TANF caseload compared to the actual recipients reported in Table 1. The reason for this is that we categorized an actual recipient as one who received welfare in any one of three years, and marital status may have changed over this period.

Table 2: Levels and Changes in Wealth Holdings for Potential Welfare Households 1994–1999

	High Risk of Welfare Use	Moderate Risk of Welfare Use
Level of Liquid Assets '94	0.0 (1,101) [105]	291 (4,595) [1,695]
Change in Liquid Assets '94-'99	0.0 (762) [445]	0.000 (2,407) [1,155]
Level of Vehicle Equity '94	0.0 (15,495) [3,178]	3,178 (7,444) [7,416]
Change in Vehicles '94-'99	0.0 (15,052) [2,300]	189 (11,581) [4,818]
Level of Net Worth '94	0.0 (56,101) [6,356]	6,886 (53,239) [30,300]
Change in Net Worth '94-'99	0.0 (68,883) [8,616]	1,903 (149,828) [29,761]
Percent with No Change in Liquid Assets	0.480 (0.500)	0.244 (0.430)
Percent with No Change in Vehicle Equity	0.237 (0.426)	0.162 (0.368)
Percent with No Change in Net Worth	0.129 (0.336)	0.024 (0.155)
Percent with Zero Liquid Assets in '94 and '99	0.467 (0.499)	0.234 (0.424)
Percent with Zero Vehicle Equity in '94 and '99	0.237 (0.426)	0.162 (0.368)
Percent with Zero Net Worth in '94 and '99	0.129 (0.336)	0.024 (0.155)

Table 2 Continued

	High Risk of Welfare Use	Moderate Risk of Welfare Use
Percent With Liquid Assets Below the Asset Limit '94	0.902 (0.298)	0.702 (0.458)
Percent With Liquid Assets Below Half the Asset Limit '94	0.871 (0.336)	0.575 (0.495)
Percent With Liquid Assets Below the Asset Limit '99	0.943 (0.232)	0.691 (0.463)
Percent With Net Worth Below the Asset Limit '94	0.586 (0.493)	0.340 (0.474)
Percent With Net Worth Below Half the Asset Limit '94	0.523 (0.500)	0.323 (0.468)
Number of Observations	515	504

NOTE: The table presents weighted means, standard deviations in parentheses, and the difference between the 75th and the 25th percentile in square brackets. High risk of welfare use households are those in the 85th percentile and above of the predicted probability of AFDC/TANF receipt, while moderate risk of welfare use households are those between the 70th and 85th percentiles. See text for additional details about definitions of the sample splits. Each subsample requires the household head to be the same from 1994–1999, the age of the head to be between 20 and 60 in 1997, the change in liquid saving to be between the 5th and 95th percentiles, and the level of 1994 liquid assets to be less than or equal to the 95th percentile. Wealth is in 1996 dollars.

We conclude this subsection with a preliminary examination of the extent to which the high and moderate risk of welfare households are likely to face binding liquid-asset limit constraints from TANF.[15] Table 2 shows that about 90 percent of the high-risk households had liquid wealth less than the state-mandated AFDC asset limit of $1000 in 1994, and 87 percent had liquid wealth less than one-half the 1994 limit. In contrast, around 70 percent of the moderate risk held liquid assets less than the 1994 state AFDC asset limit, and about one half held liquid wealth less than 1/2 the state AFDC asset limits in 1994. This suggests that for many of the high-risk households the asset limit did not appear to be a strong binding constraint prior to the limit being lifted as part of welfare reform. However, because most states that increased their asset limits did so by several thousand dollars, households in many states faced substantial opportunities to increase their asset position without penalty from TANF. Moreover, at least one-third of the moderate risk households likely found the asset limit to be a binding constraint. Each suggests that household saving may have responded to the changes in liquid asset limits.

IV. Empirical Model and Results

To estimate the impact of asset limits, IDAs, time limits, and the generosity of benefits on household saving, we implement the following baseline econometric model:

$$S_{ik} = X_{ik}\beta + \varphi\Delta LL_k + \phi VL_k + \mu VL_k * (\Delta \lim_k) + \gamma TL_k + \delta IDA_k + \eta MaxBen_k + \lambda(\Delta MaxBen_k) + \varepsilon_{ik}, \quad \textbf{(1)}$$

where S_{ik} is the amount of saving of household i in state k during the period 1994–1999 (i.e. we define $S_{ik} = A_{ik99} - A_{ik94}$, where A_{ikt} = a measure of the stock of assets of household i in state k in time t (t = 1994 or 1999)), X_{ik} is a vector of demographics that reflect household saving preferences such as income, education, age, race, marital status, and initial assets, ΔLL_k is the

[15] Data from selected issues of Quarterly Public Assistance Statistics in the 1980s and early 1990s indicates that about 4 percent of new AFDC applicants were denied benefits due to asset-limit violations, while about 1.5 percent of

change in liquid-asset limit, VL_k is a 0-1 indicator for whether the state has a vehicle-equity limit, $VL_k*(\Delta \text{lim}_k)$ is an interaction that, given a limit exists, captures the dollar change in vehicle limits, TL_k is a 0-1 indicator for whether the state has a time limit below the federal 60-month maximum, IDA_k is a 0-1 indicator reflecting whether the state offers an IDA, $MaxBen_k$ is the maximum AFDC/Food Stamp benefit for a family of 3 in the state in 1994, ($\Delta MaxBen_k$) is the change in the maximum AFDC/Food Stamp benefit for a family of 3 in the state between 1994 and 1999, and ε_{ik} is a white-noise disturbance term. For the baseline model assets are defined as liquid assets, which is the sum of checking and savings account balances, CDs, IRAs, stocks, and bonds. As part of our sensitivity checks below we will expand this definition to include vehicle equity, net home equity, and business equity.

Based on the discussion in the previous sections, the signs of φ, ϕ, and μ are indeterminate a priori due to the possibility that the higher asset and vehicle equity limits may induce some households (i.e. those at moderate risk of welfare) to reduce saving in order to qualify for TANF. However, in our samples of high-risk households, where almost all hold assets below the state limits, we predict these coefficients to be positive. Alternatively, the signs of δ and γ are expected to be positive in all our samples since contributions to IDAs do not count against the asset limit and households residing in states with short time limits are expected to experience an increase in income uncertainty sooner than residents of states with the federal maximum. Similarly, we predict that for the high risk of welfare households both η and λ will be negative. An increase in the consumption floor will reduce the need to save for precautionary reasons. Any shock to income is replaced at a higher rate in states with a higher maximum benefit leading the household to save less. However, for the moderate risk households the benefit coefficients are indeterminate

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recipients were denied benefits at recertification.

depending on the offsetting reduced precautionary motive and mechanical caseload-increasing effect of higher benefits. Assuming that ε_{ik} is uncorrelated with the regressors in equation (1), consistent and efficient estimates of the model parameters can be obtained by ordinary least squares (OLS).[16]

One potential estimation problem could occur if households shelter assets from both welfare agencies and the *PSID*. If asset sheltering is prevalent, large changes in welfare asset limits should reduce the incentives to shelter. As a result, we may observe an increase in measured assets in the data that represents nothing more than a shift from unmeasured (sheltered) savings to measured saving. This, however, seems rather unlikely for most households. An ethnographic study of low-income mothers by Edin and Lein (1997) suggests that some mothers shelter income from welfare authorities but they state clearly that none of the women own liquid assets of any note. If the results of Edin and Lein are not universal, the fact that some households shelter assets could cause us to *overstate* the effect of changing asset limits on household saving.

A. Results

Table 3 shows the results of regressing changes in household liquid assets between 1994 and 1999 on demographics and changes in welfare policy for our sample of households at high and moderate risk of entering welfare based on the probability of TANF receipt (results for actual TANF recipients are shown for comparison purposes but will not be discussed).[17] The estimated impact of a change in asset limits for those at high risk, while economically modest, is statistically

[16] In practice, however, OLS standard errors are likely to be biased both because of conditional heteroskedasticity and because of possible within-state autocorrelation, i.e. the fact that we are using multiple households in the same state to identify a state-level effect. Hence, we adjust our standard errors to correct for both forms of bias.

[17] All regressions in Tables 3–8 control for the level of liquid assets in 1994, quadratics in 1994 age and 1994-1997 average income, the number of children in 1994, and dummy indicators for marital status and race in 1994.

Table 3: Estimates of the Impact of Welfare Policy Changes on the Liquid Saving of Actual and Potential Welfare Households

	Actual AFDC Receipt	High Risk of Welfare Use	Moderate Risk of Welfare Use
Change in Liquid Asset Limit	0.013	0.090	0.070
	(0.017)	(0.039)	(0.078)
Have Vehicle Equity Limit	20.5	168.4	-214.2
	(28.5)	(63.1)	(234.5)
Change in Vehicle Limit if Limited	-0.005	-0.011	0.061
	(0.006)	(0.011)	(0.041)
Have Time Limit Less Than 60 Mths	-55.6	43.4	246.9
	(34.4)	(58.0)	(179.2)
Have IDA Program	28.2	57.9	180.8
	(30.6)	(45.9)	(202.6)
Change in Max AFDC/Food Stamp Benefit	-0.246	0.161	2.08
	(0.196)	(0.361)	(1.01)
Level of Max AFDC/ Food Stamp Benefit '94	-0.142	-0.023	1.82
	(0.137)	(0.200)	(0.66)
Number of Observations	291	515	504

NOTE: The table presents OLS estimates with standard errors that are robust to heteroskedasticity and within-state correlation in parentheses. High risk of welfare use households are those in the 85th percentile and above of the predicted probability of AFDC/TANF receipt, while moderate risk of welfare use households are those between the 70th and 85th percentiles. See text for additional details about definitions of the sample splits. Each subsample requires the household head to be the same from 1994–1999, the age of the head to be between 20 and 60 in 1997, the change in liquid saving to be between the 5th and 95th percentiles, and the level of 1994 liquid assets to be less than or equal to the 95th percentile. Each model controls for the level of liquid assets in 1994, quadratics in 1994 age and average family labor income, the number of children in 1994, and dummy indicators for marital status and race in 1994. All dollar amounts are in 1996 dollars.

significant at the 1 percent level based on a one-tailed test.[18] On average, for a $1000 increase in the liquid-asset limit liquid saving increases by $90. The modest impact is perhaps not surprising in light of the summary statistics presented in Table 2. Almost all of the high-risk households are far away from the asset limit suggesting that these asset limits do not pose a binding constraint for most very low-income households.

Surprisingly, the results are *not* stronger for those households who are most likely to find the asset limits to be binding. We reran the above regression for our high-risk of welfare sample including an interaction of the state change in asset limits between 1994 and 1999 with an indicator variable of whether the household in 1994 had between $500 and $1000 in liquid assets (regression results not reported).[19] The coefficient on the change in asset limits in this regression was 0.114 (standard error = 0.050) – similar to the 0.090 coefficient reported in column 2 of Table 3. However, the coefficient on the change in asset limit interacted with the indicator variable of whether the household had between $500 and $1000 of liquid assets in 1994 was negative and marginally statistically significant (coefficient = –0.244, standard error = 0.134). It should be noted that only 27 households had 1994 liquid assets between $500 and $1000. But given our data, there is no evidence that this group was more likely to respond to the change in asset limits compared to other households who were likely to find the 1994 asset limit to be less binding.

The results are slightly stronger when looking at changing the vehicle limits for the liquid saving of the high-risk households. Increasing vehicle limits may cause households to switch from cash to vehicles as a form in which they hold their wealth. There is some evidence of this in the

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[18] Recall that one-tailed tests are appropriate for the liquid-asset tests for the high-risk samples because theory predicts a positive coefficient, but a two-tailed test is appropriate for moderate-risk households because the sign is indeterminate.

data. We find that households in states that had some finite limit for the value of vehicles had statistically higher (p-value = 0.004) changes in liquid assets when compared with households who reside in states with unlimited vehicle equity. Households who live in states that have unlimited vehicle equity limits saved $168 *less* than households who live in states with a vehicle equity limit. Additionally, for those states with a vehicle limit, there is a negative response to changing that limit over the relevant ranges on how much a household saved between 1994 and 1999, though the impact is economically and statistically weak. From this, we conclude that large increases in vehicle limits likely led households with a high probability of welfare participation to switch out of liquid savings towards vehicle wealth, though as with asset limit changes, the economic magnitude is only modest.

The saving of the high-risk households did not respond at all to changes in time limits. Going from 5 years to 2 years of maximum lifetime benefits is a large increase in income uncertainty. Precautionary theories of saving would predict a sizable saving response over the three-year period (1996 - the period when the law changed and 1999 - the period when wealth is measured). The change in liquid wealth associated with a fall in the amount of time the household would be able to receive welfare benefits ranged is small ($43) and statistically indistinguishable from zero.[20] The impact of IDAs on the saving of the high-risk households is equally small in magnitude, but in this case the point estimate is significant at the 10 percent level. These programs are still in their infancy, but after three years from their inception household saving has only responded trivially.

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[19] We also experimented with an indicator of whether the household had between $500 and $1500 in liquid assets in 1994 and an indicator variable of whether the household had between $800 and $1200 in liquid assets. The results were similar to results for the indicator of whether the household had between $500 and $1000 in liquid assets.

[20] We also examined the Grogger and Michalopoulos (1999) conjecture of whether households with young children are more likely to hoard benefits and thus increase saving relative to other households by interacting the time limit

The impact of asset-limit changes on the liquid saving of households at moderate risk of welfare is positive, but statistically insignificant. Recall that there are countervailing impacts for this subpopulation—for some the original limit is binding such that raising it should lead to higher saving, while for others the new limit simply makes them categorically eligible for the program, while for others still the new limit is relatively more attractive and thus they lower assets in order to qualify. The positive coefficient reflects the fact that the first two groups dominate the third, but on net the statistical impact is negated.

To further explore this issue, we created an indicator variable for moderate-risk households who had liquid assets in 1994 equal to or up to $3000 more than the new future 1999 limit. We would expect that the saving of this group of households would be most likely to respond negatively to the higher limit if the higher limit makes welfare participation relatively more attractive.[21] Empirically, there is some support for this claim. We reran the regression reported in column 3 of Table 3 with the inclusion of the change in the liquid asset limit interacted with the indicator variable. The coefficient on the change in asset limit was still positive and insignificant, but the coefficient on the interaction variable was negative and statistically significant (coefficient = –0.63 with a standard error = 0.33). This suggests that some households reduced their wealth in order to become categorically eligible for TANF as asset limits were dramatically increased between 1994 and 1999.

Unlike those households at high risk of welfare use, there is some limited evidence of an operative precautionary saving motive among households at moderate risk in response to more

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variable with a variable equal to one if a child under 6 is present in the household. The sign on the interaction was negative and not close to statistical significance.

[21] We also experimented with an indicator variable for whether the household had 1994 liquid wealth between the 1999 asset limit and the 1999 asset limit plus either $1000 or $2000. The results were quite similar to those discussed in the text.

stringent time limits. The point estimate of $247, while small, is significant at the 9 percent level. At the same token, there is no statistical evidence that these same households are saving in response to IDAs. To date, most households at moderate risk of entering welfare have not yet responded to untaxed (and sometimes matched) incentives to save.

Lastly, the moderate-risk households seem to have sizable, positive responses to the level and changes in welfare benefits. Higher welfare benefits do not seem to be inducing a negative saving response among these households, rather increased benefit generosity, given the structure of the system, simply appears to be pulling higher-saving households into the pool of eligible recipients. Overall, though, our base-case estimates indicate that to date changes in welfare policy around 1996 have had at best only a modest impact on the saving of low-income households between 1994 and 1999.

V. Robustness

In this section, we offer a series of robustness checks to test whether our results hold up under alternative dependent variables and under alternative econometric specifications and sample splits.

A. Expanded Wealth Measures

In Table 3, we summarized the results of how changing welfare policies affected the change in liquid assets. In Table 4 we replicate the specifications except with the dependent variables redefined as the change in the sum of liquid assets and vehicle equity, and the change in net worth, respectively. The net worth specifications best match the model estimated by Powers (1998). A key difference in Table 4 is that for added robustness we present median regression

Table 4: Estimates of the Impact of Welfare Policy Changes on Broad Saving Measures of Potential Welfare Households

	High Risk of Welfare Use		Moderate Risk of Welfare Use	
	Changes in Liquid and Vehicle Assets	Changes in Net Worth	Changes in Liquid and Vehicle Assets	Changes in Net Worth
Change in Liquid Asset Limit	0.047 (0.114)	0.095 (0.228)	0.151 (0.478)	-0.599 (0.929)
Have Vehicle Equity Limit	580.4 (360.1)	548.5 (702.0)	1070.5 (998.4)	1014.5 (2373.5)
Change in Vehicle Limit if Limited	-0.031 (0.058)	0.209 (0.127)	-0.062 (0.185)	0.226 (0.529)
Have Time Limit Less Than 60 Mths	162.3 (248.1)	-155.7 (526.9)	-507.7 (552.5)	300.8 (2466.1)
Have IDA Program	-66.0 (184.6)	26.8 (538.3)	920.9 (925.1)	1593.3 (2798.0)
Change in Max AFDC/Food Stamp Benefit	5.57 (2.67)	3.51 (6.04)	5.50 (6.41)	12.6 (23.6)
Level of Max AFDC/ Food Stamp Benefit '94	-0.048 (1.010)	-1.28 (3.47)	-1.48 (3.98)	14.7 (11.5)
Number of Obs	515	499	504	490

NOTE: The table presents median estimates with bootstrap standard errors in parentheses. High risk of welfare use households are those in the 85th percentile and above of the predicted probability of AFDC/TANF receipt, while moderate risk of welfare use households are those between the 70th and 85th percentiles. See text and notes to Table 3 for additional details about definitions of the sample splits.

estimates as opposed to OLS estimates.[22] Because the data are trimmed based on changes in liquid assets in order to keep the samples comparable across dependent variables, there are much wider swings in the broader wealth measures as evidenced by the standard deviations reported in Table 2.

The wealth of most high welfare-risk households is tied up either in liquid assets or in vehicle wealth (few high risk of welfare households in our sample have home or business equity). As evidenced in Table 4 the effect of changing asset limits on the broader measures of wealth is weaker than on the more narrow measure of wealth in Table 3. The impact of asset-limit changes on liquid plus vehicle wealth saving is about 0.05 and is statistically insignificant. The net worth saving response to changes in asset limits of 0.095 is less than one half the magnitude found by Powers, who looked at welfare changes in 1981 on changes in household net worth over the 1978–1983 period. As indicated above, the lack of significance in the net worth models should not be surprising given that the major differences between net worth and liquid and vehicle wealth is home and business equity, the latter of which is extremely low for the samples of high-risk households. However, the point estimate on the variable indicating whether the state moved to unlimited vehicle equity for combined liquid and vehicle equity saving increased considerably to $580, which is significant at the 5.5 percent level. While the impact of vehicle limits continues to be positive, it is no longer significant in the net worth specifications. For the sample of the high-risk households, neither IDAs nor time limits have affected broad gauges of household saving.

For the moderate-risk households, a potentially interesting result is that IDAs appear to have a sizable, positive impact on broader aspects of saving, but again in no case is this impact

[22] We estimated median regressions for Table 3 as well but the coefficients were uniformly zero on all variables except for initial wealth for the high-risk samples. This is due to the extreme bunching at zero for liquid saving as documented in Table 2. We address the issue of excess zeros below.

statistically distinguishable from zero. One noticeable difference between Tables 3 and 4 for this group is that the results on the change in maximum AFDC/Food Stamp benefits are no longer reliable. While median regressions should reduce the influence of outliers, these coefficients suggest that trimming based on liquid saving may not be sufficient for models with broader wealth measures. Whether saving is measured by changes in liquid assets plus vehicle wealth, or changes in net worth, the large changes in welfare policies have had no near-term impact on broad measures of saving among households at high and moderate risk of welfare participation.

B. Alternative Samples

Next, we perform our analysis on alternative samples of high- and moderate-risk households. While we prefer the method of splitting based on the reduced-form predicted probability of welfare receipt, many other characterizations of welfare risk are possible based on income or education, and in this section we consider a select group of these alternatives. In addition to the latter samples, we also consider a sample of high and moderate-risk households based on our initial sample splits but with the additional restriction that the household head be a single female. The latter is of particular interest given the dominance of female-headed households on welfare.[23]

With the exception of the split with respect to education, there is remarkable robustness across the estimates for the high-risk samples. Specifically, restricting attention to female heads among the original sample yields estimated coefficients nearly identical to the original estimates. In addition, defining high risk of welfare as being below the poverty line or having income less than half the median income yields coefficients of about 0.075 on the liquid-asset limit change,

[23] We also considered a sample where the high-risk households are defined as being in the 90th percentile of the predicted probability of welfare receipt with little change in the point estimates.

Table 5: Sensitivity of Estimated Welfare Policy Changes on Liquid Saving to Alternative Samples

	High Risk of Welfare Use				Moderate Risk of Welfare Use			
	Prob. of AFDC >= 85th & Female Head	Income <= Poverty Line	Income <= 1/2 Median Income	Educ < 12 Years	70th < Prob AFDC Receipt < 85th & Female Head	Pov. Line < Income < 200% Pov. Line	1/2 Med < Income < Median	Educ = 12 Years
Change in Liquid Asset Limit	0.091	0.078	0.077	-0.003	0.173	0.022	0.158	0.037
	(0.047)	(0.026)	(0.033)	(0.043)	(0.108)	(0.052)	(0.083)	(0.088)
Have Vehicle Equity Limit	150.9	237.6	260.2	55.2	-121.8	-79.9	-247.1	361.8
	(73.8)	(74.4)	(87.9)	(118.5)	(464.2)	(142.8)	(339.1)	(335.5)
Change in Vehicle Limit if Limited	-0.012	-0.028	-0.037	0.017	-.074	-0.017	0.004	0.011
	(0.013)	(0.010)	(0.013)	(0.017)	(.082)	(0.021)	(0.046)	(0.064)
Have Time Limit Less Than 60 Mths	93.0	47.4	174.8	-92.6	282.3	330.7	-82.9	133.5
	(66.2)	(56.1)	(58.5)	(98.3)	(384.1)	(134.3)	(206.4)	(246.9)
Have IDA Program	76.5	-10.1	11.4	31.5	306.6	202.3	402.8	210.1
	(56.9)	(49.3)	(63.8)	(96.2)	(384.4)	(109.2)	(226.4)	(254.9)
Change in Max AFDC/Food Stamp Benefit	0.237	-0.438	-0.322	-0.570	-3.42	1.50	0.549	1.08
	(0.453)	(0.534)	(0.504)	(0.598)	(9.14)	(0.94)	(1.458)	(1.79)
Level of Max AFDC/ Food Stamp Benefit '94	-0.001	0.187	0.190	0.013	-0.479	0.641	-0.125	1.42
	(0.256)	(0.248)	(0.249)	(0.309)	(1.39)	(0.572)	(0.893)	(1.02)
Number of Obs	446	593	842	497	180	577	839	1,273

NOTE: The table presents OLS estimates with standard errors that are robust to heteroskedasticity and within-state correlation in parentheses. See text for details about definitions of the sample splits and notes to Table 3.

which is significant at the 5 percent level. Likewise, the estimated impacts of vehicle limits continue to show evidence that high-risk households in states with unlimited vehicle limits are likely to switch savings from liquid to less-liquid forms. There does appear to be some evidence of higher precautionary saving due to time limits both among female heads and in the split based on less than half the median income, but this is not robust across other samples. That the results do not hold for the education split is perhaps not surprising given the greater heterogeneity of income, wealth, and family structure in this subsample. Like the high-risk households, the results for the moderate-risk samples are also similar to those found in the base sample—except for asset-limit changes the mode result is no impact of welfare policy changes on liquid saving.

C. IV Estimates of Changes in Liquid Wealth

The changes in welfare policies associated with TANF may not be exogenous to the change in household liquid assets. For example, states with historically low saving rates may wish to dramatically increase their welfare asset and vehicle limits, or offer IDA programs and stringent time limits, in hopes of stimulating saving. Additionally, states with historically high saving rates may wish to dramatically increase their welfare asset limits because these limits would be more likely to bind for their citizens. To deal with this potential endogeniety, we re-estimate the models in Table 3 via instrumental variables, treating as endogenous all the welfare policies except for the consumption floor (which has remained relatively fixed in nominal terms). Our excluded instruments include whether the state governor in 1996 was a Democrat, whether both the state house and senate were Democratic controlled in 1996, whether both the state house and senate were Republican controlled in 1996, the state unemployment rate in 1996, and the state employment growth rate between 1995 and 1996. In addition, because some of the potentially

endogenous regressors are discrete, we also include as instruments the fitted probabilities from probit regressions of the probability the state adopts IDAs, stringent time limits, or vehicle limits. All of these instruments had power in predicting whether the state increased asset limits, whether they implemented time limits less than the federal maximum, whether they established IDAs, whether they had a finite vehicle equity limit, and the change in vehicle limit if it was finite.

Before we instrumented, we explored the need to instrument for the change in state asset limits by regressing the change in policy rules between 1993 and 1998 on the saving rate of the households in our sample between early 1989 and early 1994 and/or the instruments. Lagged household saving had no predictive power in an OLS regression with the welfare policy variables as the dependent variable (in either subsample). This suggests that states with large changes in asset limits (or any welfare policy) neither had citizens that historically saved more nor saved less than the average citizen in other states. We regressed the change in the state's asset limits over the mid 1990s on whether the state's governor in 1996 was a Democrat. The OLS regression indicated that having a Democratic governor increased the change in asset limits by about an additional $350 (the bivariate regression–not reported—had an R^2 of 0.14). We conducted extensive first-stage regressions on all of our instruments with little change in the results. Even though it appears that the change in state policies were exogenous to the saving behavior of its citizens, we still used state economic and political variables as instruments to check the robustness of our results.

The IV regression results are shown in Table 6, where for ease of exposition we only present the instrumented policy variables. The point estimate on changes in asset limits increases for both the high and moderate welfare-risk households, to 0.14 and 0.21 respectively. However, there is a nontrivial increase in standard errors, making the estimates statistically indistinguishable

Table 6: IV Estimates of the Impact of Welfare Policy Changes on Liquid Saving of Actual and Potential Welfare Households

	High Risk of Welfare Use		Moderate Risk of Welfare Use
	Actual AFDC Receipt	Prob. of AFDC >= 85^{th}	70^{th} < Prob of AFDC < 85^{th}
Change in Liquid Asset Limit	-0.107 (0.492)	0.137 (0.196)	0.208 (0.483)
Have Vehicle Equity Limit	-247.9 (444.3)	200.6 (316.8)	594.7 (928.4)
Change in Vehicle Limit if Limited	0.047 (0.117)	-0.056 (0.054)	0.067 (0.234)
Have Time Limit Less Than 60 Mths	-414.9 (350.2)	-70.9 (145.8)	29.5 (1338.9)
Have IDA Program	59.8 (1190.2)	292.6 (439.3)	873.1 (1614.2)
Number of Obs	291	515	504

NOTE: The table presents IV estimates with standard errors that are robust to heteroskedasticity and within-state correlation in parentheses. The identifying instruments include the state unemployment rate, the state employment per capita growth rate, and dummy indicators whether the governor in 1996 is a Democrat, whether both houses of the state legislature are Democratic, and whether both houses of the state legislature are Republican. See text for details about definitions of the sample splits and notes to Table 3.

from zero. Likewise, the empirical magnitudes of having a finite vehicle limit and of IDAs increase slightly after instrumenting, but again the standard errors increase more in proportion to the coefficient estimates rendering all the coefficients statistically zero.[24] Even allowing for potential endogeneity in the change in welfare policy our conclusion remains unchanged: household saving responds modestly at best to changes in welfare policies.

D. Program Interactions

Nearly 90 percent of AFDC/TANF recipients also receive assistance from the Food Stamp Program. In the years leading up to welfare reform, the nominal food-stamp liquid asset limit of $2000 (for non-elderly families) was double the nominal AFDC asset limit. However, after welfare reform many states increased their asset limit above the food stamp limit, which remained fixed at $2000 (in nominal terms). In the wake of welfare reform, the interaction effect between the resource limits in TANF and food stamps is complicated. TANF recipients continue to remain categorically eligible for food stamps even in states with asset limits above the federally set food stamp limit. However, families strictly on food stamps in the higher TANF-limit states are held to the food stamp resource rules. Likewise, those families who enter TANF after first participating on food stamps are likely to view the food stamp limit as the relevant binding constraint.

To permit the possibility of program interactions we redefine our asset limit variable in a given year to equal the minimum of the AFDC/TANF or food stamp asset limit. This implies that identification of the asset limit change is based primarily on those states that increase their limit above the food stamp limit. We report the results of this test in Table 7 for our original samples

[24] There might be some concern that some of our instruments are used in predicting welfare receipt, the latter of which is used to split our samples. However, the pattern of IV estimates is similar across the sample splits based on income to those found in Table 6, which should mitigate these concerns.

Table 7: Accounting for AFDC/TANF and Food Stamp Program Interactions on Estimates of the Impact of Welfare Policy Changes on Liquid Saving of Potential Welfare Households

	High Risk of Welfare Use		Moderate Risk of Welfare Use	
	Prob. of AFDC >= 85th	Prob. of AFDC and/or Food Stamps >= 85th	70th < Prob of AFDC < 85th	70th < Prob of AFDC and/or Food Stamps < 85th
Change in Liquid Asset Limit	0.170	0.153	0.121	0.185
	(0.068)	(0.059)	(0.227)	(0.219)
Have Vehicle Equity Limit	170.0	206.3	-227.4	-245.0
	(47.1)	(60.8)	(230.7)	(262.5)
Change in Vehicle Limit if Limited	-0.017	-0.022	0.060	0.057
	(0.013)	(0.017)	(0.045)	(0.053)
Have Time Limit Less Than 60 Mths	28.6	-17.0	236.9	68.4
	(63.2)	(79.9)	(195.1)	(233.2)
Have IDA Program	86.3	154.0	188.9	161.6
	(62.3)	(59.8)	(202.5)	(213.3)
Change in Max AFDC/Food Stamp Benefit	0.118	0.108	2.03	0.092
	(0.361)	(0.368)	(1.01)	(1.41)
Level of Max AFDC/ Food Stamp Benefit '94	-0.022	-0.041	1.83	1.50
	(0.197)	(0.213)	(0.66)	(0.69)
Number of Obs	515	526	504	498

NOTE: The table presents OLS estimates with standard errors that are robust to heteroskedasticity and within-state correlation in parentheses. See text for details about definitions of the sample splits and notes to Table 3.

as well as an analogous sample based on the predicted probability of TANF and/or food stamp receipt. The latter sample should cast a wider net among the potential welfare population.

Interestingly, allowing for program interactions, there is a near doubling of the impact of asset-limit changes on changes in liquid assets among our original samples of high and moderate risk of welfare households. Among the high-risk sample a $1000 increase in the liquid-asset limit leads to a $170 increase in liquid saving, which is statistically significant at the 1 percent level. Likewise, among the moderate-risk sample a comparable $1000 increase leads to an increase in liquid saving of $120, but again the impact is statistically zero. The estimated coefficients on the other policy variables are little changed over those found in Table 3, with the possible exception of a slightly stronger impact of IDAs on the saving of high-risk households. Moreover, the general pattern of estimates holds among the broader samples that include potential food stamp recipients. These estimates suggest that the saving response among households located in states with relatively high asset limit changes (i.e. above the food stamp limit) was more robust, but the overall effect remains modest.

E. Coping with Excess Zeros

To this point we have treated households with no assets as indistinguishable from those with positive or negative values. It is conceivable that these families are different, and that the differences are not randomly distributed; that is, some households may face a 'hurdle' to enter financial markets. For example, some families may face borrowing constraints that inhibit their ability to assume debt, others may have extremely high time discount rates, while still others may have time inconsistent preferences (Laibson 1997). If there are unobservable factors that are common to the decision of whether to save (dissave) and the *amount* saved (dissaved) then least squares estimates will not be consistent. Additionally, while it is possible that there is no

behavioral distinction between those with zero saving and those with positive or negative levels of saving, the fact that nearly half of our high-risk sample are at zero implies that there are important nonlinearities in the data that linear least squares will insufficiently capture.

In order to account for the issue of excess zeros in the dependent variable we consider a variety of alternative estimators. First, we explore the issue of whether changing welfare policy had an effect on the likelihood that the household increased or decreased its wealth between 1994 and 1999 (as opposed to focusing on the *amount* of the increase or decrease in wealth). To this end, we ran an ordered probit regression on whether liquid assets increased, decreased, or stayed the same during the five-year period on the same set of controls as in Tables 3–7. We present the results of the ordered probit for the high and moderate risk of welfare households in the first and fifth columns of Table 8. Examining the marginal effects (not reported) reveals that the likelihood of decreasing or not changing liquid saving actually increased, on average, in response to an increase in liquid-asset limits, but this impact is statistically zero. However, consistent with the evidence presented above, high-risk households who lived in a state with a finite vehicle limit were more likely to increase their savings. None of the other policy variables had any statistical impact on whether households changed their saving.

We next return to the continuous saving decision and permit the possibility that those households with zero saving may be 'different' in some fashion from those with positive or negative saving. Initially, we simply exclude households with zero assets under the assumption that the differences are random. In this specification, reported in columns two and six in Table 8, the liquid-saving response of high-risk households to the change in state asset limits almost doubles from 0.090 to 0.159, and is significantly different from zero at about the 8 percent level.

Table 8: Accounting for Excess Zeros on Estimates of the Impact of Welfare Policy Changes on Liquid Saving of Potential Welfare Households

	High Risk of Welfare Use: Prob. of AFDC >= 85th				Moderate Risk of Welfare Use: 70th < Prob of AFDC < 85th			
	Ordered Probit	OLS w/o Zero Savers or Hurdle Correction	Hurdle Correction w/ Cubic in LP	Hurdle Correction w/ Cubic in Normal	Ordered Probit	OLS w/o Zero Savers or Hurdle Correction	Hurdle Correction w/ Cubic in LP	Hurdle Correction w/ Cubic in Normal
Change in Liquid Asset Limit	-0.043	0.159	0.172	0.171	0.057	0.104	0.087	0.046
	(0.092)	(0.117)	(0.108)	(0.109)	(0.084)	(0.092)	(0.086)	(0.079)
Have Vehicle Equity Limit	0.249	251.5	302.4	291.2	0.032	-274.3	-329.4	-294.3
	(0.147)	(141.6)	(166.6)	(142.3)	(0.146)	(330.4)	(267.7)	(297.4)
Change in Vehicle Limit if Limited	-0.009	-0.013	-0.019	-0.014	-0.006	0.075	0.083	0.077
	(0.028)	(0.028)	(0.027)	(0.025)	(0.020)	(0.053)	(0.048)	(0.052)
Have Time Limit Less Than 60 Mths	-0.053	146.9	130.9	125.6	0.083	307.4	340.1	328.9
	(0.147)	(140.5)	(131.6)	(126.9)	(0.125)	(226.6)	(206.9)	(221.5)
Have IDA Program	-0.059	130.5	133.7	139.2	0.023	313.2	271.3	227.8
	(0.124)	(112.3)	(105.2)	(107.4)	(0.130)	(252.5)	(246.3)	(237.7)
Change in Max AFDC/Food Stamp Benefit	0.015	-0.258	0.071	-0.012	-0.009	2.562	2.641	2.491
	(0.102)	(0.910)	(0.853)	(0.852)	(0.099)	(0.919)	(0.992)	(0.961)
Level of Max AFDC/ Food Stamp Benefit '94	-0.013	-0.039	-0.021	-0.013	0.002	1.948	2.572	2.255
	(0.049)	(0.344)	(0.384)	(0.339)	(0.035)	(0.926)	(0.962)	(0.947)
Number of Obs	515	231	231	231	504	366	366	366

NOTE: The Ordered Probit column presents ordered-probit estimates ($1000 changes for asset limits; $100 changes for benefits). The OLS w/o Zero Savers or Hurdle Correction column presents OLS estimates for households with only positive or negative changes in liquid savings. The Hurdle Correction w/ Cubic in LP column appends the latter model with a cubic in the LP index function. The Hurdle Correction w/ Cubic in Normal column controls for a cubic in the normal index function (Lee 1982). The standard errors are robust to heteroskedasticity and within-state correlation. See the text for details about definitions of the sample splits as well as notes to Table 3.

The response to having a finite vehicle equity limit also increased slightly from $158 (Table 3) to $251, while the impact of IDAs more than doubled to just over $130.

In the remaining two models, we employ two-step, hurdle-type models to account for the possibility that households with no liquid saving are different nonrandomly from the other households.[25] These methods are akin to those found in standard two-step sample-selection models. Here we estimate a first-stage model of whether the family is a saver or a dissaver versus a zero saver on all of the control variables in the saving model plus two additional variables—an indicator variable for whether the family owned a checking account in 1994 and an indicator variable for whether the family owned a vehicle in 1994. The latter two variables should be strongly correlated with whether the family's asset position changes between 1994 and 1999, but is not likely to directly affect the amount of the asset change. In other words, having positive liquid or vehicle wealth holdings in 1994 should make the household more likely to save or dissave between 1994 and 1999 but should not provide information about how much the household will save or dissave. Using the latter variables as instruments for whether the household had non-zero changes in wealth will help us identify the second stage of the hurdle model.

[25] One option primarily used in the literature to handle the large amount of zeros in a sample is to run a Tobit estimator. However, from an economic standpoint our data is not well suited for such an analysis. In levels, zero wealth may imply a household being liquidity constrained. For such households, we would observe zero wealth holdings even though the households' desired wealth holdings are negative. But given that we are focusing on *changes* in wealth, this need not be the case. The desired change in wealth for liquidity constrained households could actually be positive, negative or zero. For completeness, we did run the Tobit estimate censoring the lower tail of our change in wealth distribution at zero. The results were very similar to those reported for the hurdle-type models reported in Table 8. We also experimented with a nonparametric alternative to the Tobit via Powell's (1984) censored LAD estimator. Even after repeated efforts at rescaling the regressors, this estimator failed to converge. In addition, we also examined more flexible estimators such as the quantile estimator. As noted previously, the median estimator failed to converge for liquid-saving models, but the 80th percentile did converge to point estimates similar to the OLS estimates reported in Table 3.

As pointed out in the sample-selection literature (e.g. Lee 1982; Deaton 1997; Newey 1999), the standard two-step model based on the normal distribution can suffer from low power to detect nonrandom selection if there are departures from linearity and/or normality. Instead, we employ flexible variants of the conditional mean function that are more robust to departures from linearity and normality. Specifically, in the first stage we estimate both a linear probability and probit model of whether the household had non-zero saving in 1994–1999. We then run two separate second stage regressions. In one instance, we reestimate equation (1), excluding zero savers, but including as additional regressors a cubic polynomial in the predicted probability of having non-zero saving from the first stage linear probability model (Deaton 1997). In the second case, we include as additional regressors a cubic in the index function from the first-stage probit regression (Lee 1982).[26]

Columns 3–4 and 7–8 of Table 8 report the results from the hurdle-type models based on the linear probability and probit first stage regressions, respectively. Not surprising, the results are similar for both methods. Holding the sample composition constant, the direct effect of controlling for the excess zeros nearly doubles the impact of asset limit changes on changes in liquid savings among the high-risk sample as compared to the coefficient of 0.090 reported in Table 3. Furthermore, the impact is similar to the OLS regression in which we restrict the sample

[26] Specifically, defining z_{ik} as the vector of variables in the first stage (includes X_{ik}) and $z_{ik}\hat{\alpha}$ as the estimated index function from the first stage linear probability or probit model, the second-stage conditional-mean terms for the linear probability case are $z_{ik}\hat{\alpha}$, $(z_{ik}\hat{\alpha})^2$, and $(z_{ik}\hat{\alpha})^3$ (Deaton 1997). Lee's (1982) conditional-mean terms from the first-stage probit are given as $\frac{\phi(z_{ik}\hat{\alpha})}{\Phi(z_{ik}\hat{\alpha})}$, $\frac{z_{ik}\hat{\alpha}\phi(z_{ik}\hat{\alpha})}{\Phi(z_{ik}\hat{\alpha})}$, and $\left[(z_{ik}\hat{\alpha})^2 - 1\right]\frac{\phi(z_{ik}\hat{\alpha})}{\Phi(z_{ik}\hat{\alpha})}$, where $\phi(.)$ and $\Phi(.)$ are the pdf and cdf of the normal distribution. Note that the first term is the standard Inverse Mills Ratio as derived by Heckman in the case of selection. Newey (1999) argued that the linear probability model of selection correction is fairly robust to nonparametric alternatives, while Deaton (1997) claimed that a polynomial version offers more flexibility in that it is likely a close approximation to the true underlying conditional-mean function. Likewise, Lee (1982) showed that that it is possible to capture deviations from normality *and* linearity by appealing to Edgeworth-type expansions to arrive at more flexible versions of the Heckman-type correction.

to those households with non-zero wealth changes. While the economic magnitude is still modest, about $170 for every $1000 change in the limit, the evidence is suggestive that household saving is responding to the higher asset limits. Likewise, there is a more sizable impact of vehicle equity limit changes. This is further evidence that households in states that permit unlimited vehicle assets are utilizing that rule to convert liquid assets into vehicle wealth. In addition the coefficient estimates in the hurdle models indicate that there is some precautionary saving response to more stringent time limits among the moderate-risk sample (about $340 with p-value = 0.05), and that high risk of welfare households are making contributions to IDAs (p-value = 0.1).[27,28]

VI. Conclusion

We examined the impact on household saving of new saving incentives offered to welfare recipients after the 1996 overhaul of the U.S. welfare system. Specifically, we used data from the Panel Study of Income Dynamics, along with state-specific program information, to test whether increasing the liquid-asset and vehicle limits, imposing time limits, introducing Individual Development Accounts, or changing the generosity of welfare benefits led to an increase in saving among households at risk of entering welfare. These tests are important both from a program evaluation perspective and because they provide additional evidence on the extent to which the theoretical predictions of Hubbard et al. (1995) are borne out in the data.

Are the 'poor' on the road to self-sufficiency after welfare reform? The evidence presented here suggests that progress is slow with respect to improved financial balance sheets.

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[27] For both subsamples, Wald tests on the additional regressors rejected the null hypothesis of no nonrandom differences. Similar results obtain if we use the more standard two-step procedures.

[28] We also considered a model that combines the TANF/Food Stamp interactions in Section V.D with the hurdle model in Section V.E. The asset limit coefficient for the high-risk sample increases to 0.23, but with a standard error of 0.21 it is not statistically significant at conventional levels.

We found that increasing asset limits had a modest effect on the liquid saving of households at high risk of entering welfare, upwards of a $170 increase per $1000 increase in the limit, but no overall effect on households at moderate risk of welfare participation or on broader measures of saving for either sample. Indeed, we found some evidence that the moderate-risk households dissaved in response to the higher asset limits. This is consistent with the implications of Hubbard et al. (1995), and highlights some drawbacks of raising asset limits. Moreover, we found that liquid saving among high risk of welfare households fell in states that removed their vehicle equity limits, perhaps because they converted their liquid savings into vehicle wealth. While this change could enhance welfare-to-work transportation needs, the economic magnitude is quite small, on the order of $200 to $300 over five years. Moreover, to the extent that households are better able to use more liquid forms of savings to smooth shocks or if vehicle wealth depreciates rapidly, this asset conversion could make them more vulnerable financially in the event of a negative income shock.

Furthermore, we find some evidence that IDAs are having a positive, albeit small, impact on the liquid saving of high welfare-risk households. The upper-bound estimate of $140 after three years is less than half the magnitude found in the ADD evaluation, but perhaps this is not surprising given that nearly a quarter of the ADD participants are college graduates compared to one percent of our high welfare-risk sample and thus more likely to be active savers. As noted in the text, we interpret the IDA result with caution. These programs are not as widespread within states as the other welfare policy changes at this time. We believe a more complete study of IDAs will be needed in a few years to assess how the program is affecting household saving.

Perhaps it is still premature to make definitive claims on saving given the infancy of all the new programs. At the same token, as documented extensively throughout, around 90 percent of

high welfare-risk households and nearly two-thirds of moderate welfare-risk households held liquid wealth below one half of the pre- welfare-reform limit. This suggests that the limits are rarely binding for most households and thus it is not too surprising that the saving only responds modestly at best to the majority of the large changes in saving incentives offered through the welfare system.

If it is not the disincentives to save offered through the welfare system that explains the low saving behavior of poor households then what does explain why the poor save so little? Any theory put forth to explain the asset accumulation of low-income households needs to reconcile the large percentage of households who persistently hold zero liquid assets. However, these theories need not rely on non-optimizing households. Variants of the life cycle model where households have high intertemporal discount rates or have time inconsistent preferences have been shown through calibration and simulation to match the large fraction of households with zero liquid assets in the data (see Angeletos et al. 2001). Regardless, the road to self-sufficiency for the poor is long indeed.

Appendix Table 1: Changes in State Asset and Vehicle Equity Limits as of FY1998

State	Change in Asset Limit	Amount of Change ($)	Change in Vehicle Limit	Amount of Change ($)
Alabama	x	1000	x	one vehicle
Alaska			x	all vehicles
Arizona	x	1000	x	one vehicle
Arkansas	x	2000	x	one vehicle
California	x	1000	x	3150
Colorado	x	1000	x	one vehicle
Connecticut	x	2000	x	one vehicle
Delaware			x	3150
District of Columbia				
Florida	x	1000	x	7000
Georgia			x	3150
Hawaii	x	4000	x	one vehicle
Idaho	x	1000	x	3150
Illinois	x	2000	x	one vehicle
Indiana	x	500		
Iowa	x	4000	x	2389
Kansas	x	1000	x	one vehicle
Kentucky	x	1000	x	one vehicle
Louisiana	x	1000	x	8500
Maine	x	1000	x	one vehicle
Maryland	x	1000	x	one vehicle
Massachusetts	x	1500	x	3500
Michigan	x	2000	x	one vehicle
Minnesota	x	4000	x	6000
Mississippi				
Missouri	x	4000	x	one vehicle
Montana	x	2000	x	one vehicle
Nebraska	x	5000	x	one vehicle
Nevada	x	1000	x	one vehicle
New Hampshire	x	1000	x	one vehicle
New Jersey	x	1000	x	8000
New Mexico	x	500	x	one vehicle
New York	x	1000	x	3150
North Carolina	x	2000	x	3500
North Dakota	x	7000	x	one vehicle
Ohio[a]			x	one vehicle
Oklahoma			x	3500
Oregon	x	1500	x	8500
Pennsylvania			x	one vehicle
Rhode Island			x	3150
South Carolina	x	1500	x	8500
South Dakota	x	1000	x	3150
Tennessee	x	1000	x	3100
Texas	x	1000	x	3150
Utah	x	1000	x	6500
Vermont			x	one vehicle
Virginia			x	6000
Washington			x	3500
West Virginia	x	1000	x	3000
Wisconsin	x	1500	x	8500
Wyoming	x	1500	x	10500

Source: Gallagher et al. (1998); TANF Report to Congress (August 1998)

[a] By the end of the 1998 fiscal year Ohio became the only state without a liquid asset limit.

All dollar amounts are in current dollars.

Appendix Table 2: State Termination Time Limits as of FY1998

State	Limit Less Than Federal Maximum	Number of Months
Alabama		
Alaska		
Arizona		
Arkansas	x	24
California		
Colorado		
Connecticut	x	21
Delaware	x	48
District of Columbia		
Florida	x	24 out of 60
Georgia	x	48
Hawaii		
Idaho	x	24
Illinois	x	24
Indiana		
Iowa		
Kansas		
Kentucky		
Louisiana	x	24 out of 60
Maine		
Maryland		
Massachusetts	x	24 out of 60
Michigan		
Minnesota		
Mississippi		
Missouri		
Montana		
Nebraska	x	24 out of 48
Nevada	x	24
New Hampshire		
New Jersey		
New Mexico	x	36
New York		
North Carolina	x	24 out of 60
North Dakota		
Ohio	x	36
Oklahoma		
Oregon	x	24 out of 84
Pennsylvania		
Rhode Island		
South Carolina	x	24 out of 120
South Dakota		
Tennessee	x	18
Texas		
Utah	x	36
Vermont		
Virginia	x	24
Washington		
West Virginia		
Wisconsin		
Wyoming		

Source: Gallagher et al. (1998); TANF Report to Congress (August 1998)

Appendix Table 3: State Individual Development Accounts as of FY1998

State	Permitted	Account Limit ($)
Alabama		
Alaska		
Arizona	x	9000
Arkansas	x	not specified
California	x	5000
Colorado	x	not specified
Connecticut		
Delaware	x	5000
District of Columbia		
Florida		
Georgia	x	5000
Hawaii		
Idaho		
Illinois	x	not specified
Indiana		
Iowa	x	not specified
Kansas		
Kentucky	x	5000
Louisiana	x	6000
Maine	x	10000
Maryland		
Massachusetts		
Michigan		
Minnesota		
Mississippi		
Missouri	x	not specified
Montana	x	not specified
Nebraska		
Nevada		
New Hampshire		
New Jersey		
New Mexico	x	not specified
New York	x	not specified
North Carolina		
North Dakota		
Ohio	x	10,000
Oklahoma	x	2000
Oregon	x	20,000
Pennsylvania	x	not specified
Rhode Island		
South Carolina	x	10,000
South Dakota		
Tennessee	x	5000
Texas		
Utah		
Vermont		
Virginia	x	5000
Washington	x	3000
West Virginia		
Wisconsin		
Wyoming		

Source: Center for Social Development (2000a); Gallagher et al. (1998); TANF Report to Congress (August 1998)
All dollar amounts are in current dollars.

Appendix Table 4: Maximum State AFDC/TANF Benefits for a Family of Three

State	1994	1999
Alabama	$164	$164
Alaska	923	923
Arizona	347	347
Arkansas	204	204
California	607	565
Colorado	356	356
Connecticut	680	636
Delaware	338	338
District of Columbia	420	379
Florida	303	303
Georgia	280	280
Hawaii	712	712
Idaho	317	276
Illinois	367	377
Indiana	288	288
Iowa	426	426
Kansas	429	429
Kentucky	228	262
Louisiana	190	190
Maine	418	418
Maryland	366	388
Massachusetts	579	579
Michigan	459	459
Minnesota	532	532
Mississippi	120	120
Missouri	292	292
Montana	401	461
Nebraska	364	364
Nevada	348	348
New Hampshire	550	550
New Jersey	424	424
New Mexico	357	489
New York	577	577
North Carolina	272	272
North Dakota	409	440
Ohio	341	362
Oklahoma	324	292
Oregon	460	460
Pennsylvania	421	421
Rhode Island	554	554
South Carolina	200	201
South Dakota	417	430
Tennessee	185	185
Texas	184	188
Utah	414	451
Vermont	638	656
Virginia	354	354
Washington	546	546
West Virginia	249	253
Wisconsin	517	673
Wyoming	360	340

Source: 1994 Green Book and Congressional Research Service Report 98–480.
All dollar amounts are in current dollars.

Appendix Table 5: Probit Estimates of AFDC/TANF and/or Food Stamp Participation

	AFDC/TANF	AFDC and/or Food Stamps
Age of Head	-0.142	-0.105
	(0.030)	(0.023)
Age of Head Squared	0.001	0.001
	(0.000)	(0.000)
Dummy: Less than High School Education	1.495	1.309
	(0.283)	(0.138)
Dummy: Only High School Education	1.145	1.030
	(0.271)	(0.123)
Dummy: Some College	0.927	0.647
	(0.255)	(0.122)
Dummy: Female Head	0.785	0.370
	(0.180)	(0.119)
Dummy: Female Head * Less than High School	0.256	0.458
	(0.216)	(0.163)
Dummy: Female Head * Only High School	0.125	0.020
	(0.194)	(0.138)
Number of Children under age 18	0.359	0.324
	(0.030)	(0.024)
Dummy: Married	-0.429	-0.610
	(0.128)	(0.082)
Dummy: Head is African American	0.386	0.588
	(0.085)	(0.062)
State Unemployment Rate	0.056	0.060
	(0.033)	(0.024)
State Growth Rate of Employment	0.587	2.154
	(3.130)	(2.188)
Dummy: Governor Democrat	-0.192	0.047
	(0.080)	(0.059)
Dummy: State House & Senate Democrat	-0.124	-0.093
	(0.087)	(0.064)
Dummy: State House & Senate Republican	-0.163	-0.003
	(0.180)	(0.122)
Constant	-0.524	-0.537
	(0.628)	(0.462)
Centiles of Predicted Probabilities:		
70th Percentile	0.050	0.211
85th Percentile	0.174	0.409
90th Percentile	0.301	0.572
95th Percentile	0.493	0.736
Number of Observations	3941	3941

NOTE: The table presents probit estimates with robust standard errors in parentheses. The dependent variable Equals one if the head receives AFDC/TANF (or food stamps) in any year between 1994-1997. The independent variables are measured as of the baseline year 1994. Each subsample requires the household head to be the same from 1994–1999, and the age of the head to be between 20 and 60 in 1997.

Appendix Table 6: Selected Demographic Characteristics for Alternative Samples of Potential Welfare Households in 1994

	High Risk of Welfare Use			Moderate Risk of Welfare Use		
	Income <= Poverty Line	Income <= 1/2 Median Income	Educ < 12 Years	Pov. Line < Income < 200% Pov. Line	1/2 Median < Income < Median	Educ = 12 Years
Age of Head	37.5	36.3	37.2	34.9	35.5	36.7
	(10.2)	(10.4)	(10.5)	(9.5)	(9.7)	(9.3)
Average Labor Income '94-'97	4,576	8,557	19,263	19,739	27,106	33,199
	(5,281)	(6,298)	(18,732)	(7,782)	(4,965)	(21,455)
Percent Married	0.216	0.177	0.407	0.380	0.378	0.514
	(0.412)	(0.382)	(0.492)	(0.486)	(0.485)	(0.500)
Percent Black	0.456	0.379	0.295	0.244	0.185	0.214
	(0.499)	(0.485)	(0.457)	(0.430)	(0.389)	(0.410)
Number of Children	1.43	1.01	1.15	1.21	0.765	1.02
	(1.42)	(1.30)	(1.25)	(1.25)	(1.06)	(1.18)
Percent Female Heads	0.602	0.586	0.400	0.411	0.333	0.242
	(0.490)	(0.493)	(0.490)	(0.492)	(0.472)	(0.429)
Percent < High School	0.413	0.292		0.162	0.137	
	(0.493)	(0.455)		(0.369)	(0.345)	
Percent High School	0.415	0.401		0.463	0.445	
	(0.493)	(0.490)		(0.499)	(0.497)	
Percent Some College	0.123	0.199		0.234	0.241	
	(0.328)	(0.400)		(0.424)	(0.428)	
Percent College	0.049	0.108		0.141	0.176	
	(0.216)	(0.310)		(0.348)	(0.381)	
Number of Observations	595	845	499	581	849	1279

NOTE: The table presents weighted means and standard deviations in parentheses. See text for details about definitions of the sample splits. Each subsample requires the household head to be the same from 1994–1999, the age of the head to be between 20 and 60 in 1997, the change in liquid saving to be between the 5th and 95th percentiles, and the level of 1994 liquid assets to be less than or equal to the 95th percentile. Income is in 1996 dollars.

Appendix Table 7: Levels and Changes in Wealth Holdings for Alternative Samples of Potential Welfare Households 1994–1999

	High Risk of Welfare Use			Moderate Risk of Welfare Use		
	Income <= Poverty Line	Income <= 1/2 Median Income	Educ < 12 Years	Pov. Line < Income < 200% Pov. Line	1/2 Median < Income < Median	Educ = 12 Years
Level of Liquid Assets '94	0.000	0.000	0.000	212	758	848
	(2,252)	(2,558)	(3,627)	(3,880)	(7,843)	(10,169)
Change in Liquid Assets 94-99	0.000	0.000	0.000	0.000	0.000	0.000
	(838)	(1,060)	(1,271)	(1,831)	(3,361)	(3,931)
Level of Vehicle Equity '94	0.000	0.000	848	3,178	4,238	5,297
	(14,897)	(11,684)	(8,383)	(7,680)	(9,637)	(12,704)
Change in Vehicles 94-99	0.000	0.000	0.000	755	755	240
	(14,609)	(11,821)	(8952)	(9,385)	(12,212)	(14,643)
Level of Net Worth '94	0.000	318	2,119	5,297	9,005	14,832
	(50,441)	(47,955)	(63,405)	(55,166)	(118,391)	(247,428)
Change in Net Worth 94-99	0.000	25	0.000	2,396	4,722	3,437
	(40,558)	(44,335)	(53,460)	(157,372)	(89,102)	(174,270)
Percent with No Change in Liquid Assets	0.535	0.401	0.431	0.196	0.106	0.157
	(0.499)	(0.490)	(0.496)	(0.397)	(0.308)	(0.364)
Percent with No Change in Vehicle Equity	0.270	0.200	0.189	0.079	0.073	0.072
	(0.445)	(0.401)	(0.391)	(0.270)	(0.260)	(0.258)
Percent with No Change in Net Worth	0.141	0.086	0.108	0.017	0.009	0.020
	(0.349)	(0.280)	(0.311)	(0.128)	(0.093)	(0.140)

All dollar amounts are in 1996 dollars.

Appendix Table 7 Continued

	High Risk of Welfare Use			Moderate Risk of Welfare Use		
	Income <= Poverty Line	Income <= 1/2 Median Income	Educ < 12 Years	Pov. Line < Income < 200% Pov. Line	1/2 Median < Income < Median	Educ = 12 Years
Percent with Zero Liquid Assets in '94 and '99	0.522 (0.500)	0.390 (0.488)	0.429 (0.496)	0.189 (0.392)	0.100 (0.300)	0.150 (0.357)
Percent with Zero Vehicle Equity in '94 and '99	0.270 (0.444)	0.200 (0.400)	0.189 (0.392)	0.079 (0.270)	0.073 (0.260)	0.072 (0.258)
Percent with Zero Net Worth in '94 and '99	0.141 (0.349)	0.086 (0.280)	0.108 (0.310)	0.017 (0.128)	0.009 (0.300)	0.020 (0.140
Percent With Liquid Assets Below the Asset Limit '94	0.947 (0.225)	0.856 (0.352)	0.813 (0.390)	0.710 (0.454)	0.554 (0.497)	0.539 (0.499)
Percent With Liquid Assets Below Half the Asset Limit '94	0.910 (0.287)	0.802 (0.399)	0.749 (0.434)	0.604 (0.489)	0.416 (0.493)	0.439 (0.496)
Percent With Liquid Assets Below the Asset Limit '99	0.932 (0.251)	0.868 (0.339)	0.833 (0.373)	0.769 (0.421)	0.609 (0.488)	0.614 (0.487)
Percent With Net Worth Below the Asset Limit '94	0.547 (0.498)	0.474 (0.500)	0.438 (0.497)	0.346 (0.476)	0.286 (0.452)	0.230 (0.421)
Percent With Net Worth Below Half the Asset Limit '94	0.502 (0.500)	0.427 (0.495)	0.386 (0.487)	0.296 (0.457)	0.255 (0.436)	0.202 (0.401)
Number of Observations	595	845	499	581	849	1279

NOTE: The table presents means (medians for wealth) and standard deviations in parentheses. See text for details about definitions of the sample splits. Each subsample requires the household head to be the same from 1994–1999, the age of the head to be between 20 and 60 in 1997, the change in liquid saving to be between the 5th and 95th percentiles, and the level of 1994 liquid assets to be less than or equal to the 95th percentile. Wealth is in 1996 dollars.

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