REENTERING ASSET POVERTY AFTER AN EXIT: EVIDENCE FROM THE PSID

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Abstract

In order to be successful at improving household's financial self-sufficiency and stability, asset-building policies must be designed to prevent households from falling back into asset poverty once they exit it. This paper uses the Panel Study of Income Dynamics data from 1994 to 2007 to analyze the influence of life events, demographics and financial behaviors on the duration *out of* asset poverty. We find evidence that suggests there are structural barriers to asset acquisition. Asset accumulation at levels equal to nine months worth of income at the income poverty level or greater is important for improving a family's odds of permanently escaping asset poverty. Additionally, minimizing debt and diversifying the asset portfolio to include more productive assets are important for maintaining assets. This paper provides some insights on policies to help individuals more successfully transition out of asset poverty.

Keywords: Asset, Poverty

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Disclaimer

The views expressed in the paper are those of the authors and do not necessarily represent the views of the Federal Reserve Bank of Dallas or the Federal Reserve System.

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Introduction

The stability of household finances has implications for both individuals and the broad economy. At the micro level, financial instability increases a household's chance of suffering from poor nutrition and health (Blazer, Sachs-Ericsson et al. 2005; Meyers, Cutts et al. 2005), limited health care access (Long 2003), foreclosure, and unstable relationships within the family (Kearns, Hiscock et al. 2000). At the macro level, more prudent household debt management reduces credit risk, which increases the stability of the financial system. The recognized importance of stable household finances is evidenced by the large role that government and employment-based assistance programs have historically played in this arena. However, these programs have declined over the past several decades, leaving individuals and families to shoulder an increasing share of responsibility for their own financial wellbeing (Hacker 2004).

Financial wellbeing may be measured by income flows and asset holdings—two distinct but related concepts. Income measures the flow of money a household controls each period while assets measure the accumulation of wealth. Adequate asset accumulation can help households weather temporary shortfalls in income flows. Current public policy aimed at alleviating poverty focuses on either increasing income—such as many current entitlement programs[1]—or encouraging asset accumulation. While both income and assets provide resources to cover necessary living expenses, assets also can improve risk management, and increase a household's access to other financial products. Thus assets can be used to support immediate needs, improve self-sufficiency and increase the stability of household finances. However, to be successful at

[1] Federal entitlement programs in the United States include Social Security, Medicare, and Medicaid, most Veterans' Administration programs, federal employee and military retirement plans, unemployment compensation, food stamps, and agricultural price support programs.

improving financial self-sufficiency and stability, asset-building policies must be designed to prevent households from falling back into asset poverty once they exit it.

The fall back into asset poverty following an exit event—or reentry— is the focus of this paper. We consider households who are first observed to be in asset poverty, but later accumulate sufficient assets to exit asset poverty. For these households, we analyze their asset poverty dynamics by looking at life events, demographics and financial behaviors in order to determine which factors influence the duration *out of* asset poverty and prevent them from falling back in. The purpose of this study is to inform policies that help individuals or households retain and grow their assets in the long term.

The focus on households that are transitioning out of asset poverty has particular policy relevance. Policies that encourage and incentivize long-term savings and asset accumulation such as matched retirement accounts, tax rate reduction for long-term capital gains and dividends, and estate tax exemptions are more abundant for higher income households or households that have successfully accumulated some assets. However, the asset eligibility rules of some public benefit programs such as Medicaid and Supplementary Security Income may actually de-incentivize asset accumulation (Chen and Lerman 2005). This disconnect suggests that for households transitioning from asset poor to non-asset poor, a better understanding of the dynamics of asset-poverty reentry is critical. The insights may help improve financial advice and policy design enabling households to better sustain their non-asset poor position.

Next we present a brief overview of asset poverty in the U.S. and related existing studies. We then discuss conceptual frameworks that help explain the dynamics of asset poverty. The data and the empirical strategies we use are described in section four and the results are presented in section five. We conclude with comparisons to previous studies and policy implications.

Asset poverty—a disconcerting phenomenon

The concept of "asset poverty" indicates the lack of means to handle financial shortfalls. Thus, when considering financial *stability*, assets serve as a more reliable means of securing household finances than rather "unpredictable" income flows (Oliver and Shapiro 1990; Oliver and Shapiro 1995). Without sufficient assets, even income shortfalls that do not place a household below the income poverty threshold can be quite devastating. Households with a low level of assets are particularly sensitive to unemployment, family structure change, unexpected medical expenses, and natural disasters.

The definition of asset poverty was first suggested by Haveman and Wolff (Haveman and Wolff 2005): a household that does not have net worth to sustain income for three months above the federal income poverty level, or net worth equal to 25 percent of the annual income poverty level, is considered *asset poor*.[2] Based on this definition, the rate of asset poverty in the U.S. far exceeds the rate of income poverty. According to the 2007 Survey of Consumer Finances (SCF) conducted by the Federal Reserve Board, 30.6 percent of U.S. households were liquid asset poor and 16.1 percent were net worth asset poor (Ratcliffe and Vinopal 2009). In comparison, the income poverty rate was about 9.6 percent according to the 2006-2008 American Community Survey's three-year estimates. Prior to the Great Recession that began in December 2007, the prevalence of income poverty had declined substantially, but the prevalence of asset poverty had remained relatively stable. Thus, despite the fact that assets have the potential to mitigate the negative impact of temporary income poverty, more U.S. households were asset poor than were income poor.

[2] The income poverty threshold adopted by the U.S. government is based on the income a household makes, adjusted for inflation and household size. It has been used as a benchmark for comparison across studies over time and also for determining qualifications for various government assistance programs.

As one might expect, lower-income households have accumulated fewer assets than higher-income households. However, in an economic downturn, even middle-income households are likely to have lost jobs or homes and become asset poor (Carasso and McKernan 2008). Half of all households with children are asset poor (Aratani and Chau 2010). Further, the asset gap between rich and poor households appears to be widening. According to the SCF, the median net worth for the lowest 25 percent of the distribution of household net worth dropped from $1,900 in 2004 to $1,200 in 2007, while the median net worth for the highest 25 percent increased by 20 percent over that period (Bucks, Kennickell et al. 2009).

Although the aggregate poverty rates estimated in various studies indicate the overall financial situation of the population, longitudinal survey data must be analyzed to provide insights on the causes and consequences of poverty. Using the Panel Study of Income Dynamics (PSID) data to estimate asset poverty rates it was found that the risk of becoming asset poor is highly associated with the experience of being asset poor (Caner and Wolff). About 60 percent of asset-poor households (when all assets are included in the measure) remain poor five years later and the persistence is about 70 percent when home equity is not included in the measure of assets. A life table analysis examining the duration and patterns of asset poverty using PSID data from 1984 to 2004 revealed that asset poverty is more prevalent among young adults, but is seen in all age groups (Rank and Hirschl 2010). Further one's experience of asset poverty differs with differences in race, education, homeownership, and family structure--which is consistent with the findings in the studies of income poverty (McKernan and Ratcliffe 2005). While the literature indicates that asset poverty rates are both high and persistent, no known studies examine the experience of households after escaping asset poverty, or the possibility of reentry. We explore this aspect of asset poverty dynamics.

Asset Poverty Reentry, a Conceptual Framework

To understand asset poverty dynamics, it is crucial to differentiate between structural and idiosyncratic challenges to wealth accumulation. Structural barriers to asset accumulation have received little attention in the literature focused on asset poverty in developed nations, but they have been a well-studied topic when considering poverty in the developing world. One hypothesized structural barrier is the existence of a "Micawber Threshold"—a level of wealth above which individuals over time can achieve higher standards of living while below which individuals are likely to fall into a poverty trap (Stevens 1999). Carter and Barrett (Carter and Barrett 2006) constructed a model to depict asset-accumulating paths of different individuals or households in order to study the dynamics of asset poverty. The model is based on the premise that shifts in a household's stock of assets can occur in one of two ways: asset accumulation (inheritance, saving, etc.) or increased asset returns (the assets grow themselves). If asset returns are locally increasing, then a positive relationship exists between the marginal return on assets and wealth. This relationship paired with some barrier to acquisition of high-return assets—such as a minimum initial investment—results in the existence of a Micawber threshold.

A similar threshold can emerge due to credit market imperfections and heterogeneous asset types (Zimmerman and Carter 2003). Credit market imperfections cause risk management to be more expensive for poor households. Poor households then invest more in "buffer assets" (low-risk, low-yield assets such as savings accounts) rather than productive assets (which are riskier), while wealthy households invest primarily in productive assets. The model suggests that there is some level of wealth below which households are not able to invest in the more risky productive assets because the risk of not being able to provide for the most basic needs is nontrivial. When income shocks cause the erosion of a household's assets, wealthy households can

rely on the remaining productive assets to rebuild wealth, while poor households face wealth depletion.

The concept of the Micawber threshold is important because it helps distinguish "structural" poverty from "transitory" poverty that happens naturally or randomly. For those households who are able to cross the Micawber threshold and acquire high-return assets, stochastic spells of income poverty would not lead to persistent poverty, unless assets are depleted beyond the threshold. However, the high-return region is beyond the reach of many individuals or households that have limited access to risk management tools or little assets to start with.

We adopt this threshold concept in our study because it is useful for examining how the transitions between being and not being asset poor happen, and whether the exit from asset poverty can actually lift the individual or household to a healthier region for asset accumulation. Additionally it would be interesting to understand if the widely adopted definition of asset-poverty threshold—wealth equivalent to three months of income at the poverty level—corresponds to an asset level that enables a household to stay out of asset poverty for a long time. Further, does an asset threshold exist such that households reaching the threshold are less likely to fall back into asset poverty?

These theoretical underpinnings result in two hypotheses:

Hypothesis 1: *There exists some asset level threshold above which the risk of future asset poverty decreases, while below which the risk of future asset poverty increases.*

Hypothesis 2: *Households with asset portfolios containing productive assets exhibit a decreased likelihood of future asset poverty.*

Empirically identifying a Micawber threshold or a "best" asset portfolio is beyond the data limitations and the scope of this study. However, the empirical section will provide evidence for or against the two hypotheses—an important first step in understanding the factors that influence the sustainability of asset-based poverty-alleviation policy.

Empirical Strategy

We create an empirical model to describe the dynamics of asset poverty reentry by applying event history analysis to longitudinal survey data of household asset positions.

The model

Our analysis seeks to understand the duration of exits from asset poverty. The time from an exit from asset poverty to the subsequent reentry into asset poverty (a failure event) is defined by a random variable, *T*. *T* has a continuous probability distribution, *f(t)*, where *t* is a realization of *T*. The cumulative probability for *t* is given by

$$F(t) = \int_0^t f(s)ds = Prob(T \leq t) \qquad (1)$$

The survival function, *S(t)*, is the probability that a household remains outside of poverty for at least *t* periods and is given by

$$S(t) = 1 - F(t) = Prob(T \geq t) \qquad (2)$$

The hazard rate, *h(t)*, combines both *F(t)* and *S(t)* by defining the rate at which households are likely to reenter asset poverty after a duration of *t* periods given that they have remained outside of asset poverty for *t* periods.

$$h(t) = \frac{f(t)}{S(t)} \qquad (3)$$

In the context of our study, the hazard is defined as a depletion of assets such that the household's wealth falls below 25 percent of the poverty line (or the value of assets is equivalent to three months' income at the poverty level). Since the PSID asset data is recorded biennially, each period, *t*, corresponds to two years. Thus, the hazard function answers an important question: If a household has remained out of asset poverty, what is the probability that they will reenter asset poverty during the next period?

We use a Cox proportional hazard model to estimate the association between covariates and the hazard rate. The Cox model allows us to estimate this relationship without specifying a functional form for the duration dependency—thus providing a highly flexible way of analyzing duration dependence without restrictive distributional assumptions. The hazard rate for the Cox model may be written as the product of a baseline hazard, $h_o(t)$, that is not parameterized; and an expression, parameterized in terms of a set of covariates, that models the ordered duration times:

$$h(t, M, X, V) = h_o(t)\exp(M\beta_1 + X\beta_2 + V\beta_3) \qquad (4)$$

In the expression above, *M* represents a vector of explanatory variables characterizing the initial situation of a household when moving out of asset poverty, such as the level of asset beyond the amount required to exit poverty, the prior asset-poverty history of the household, and a dummy variable indicating the year and the macroeconomic conditions when the exit took place. *X* is a vector of variables that describe the household's non-time varying demographic characteristics, which include the age and race of the head of the household. *V* is a vector of household status

variables that may change over time, which include presence of children in the household, education of the head, homeownership, automobile ownership, health status of the head, health insurance coverage, household income, presence of a single head and the composition of the household's asset portfolio. The variables we include in the empirical models are listed in Table 1.

In order to understand how the household status both at the time of exit and after the exit influences the likelihood of a return to asset poverty, we estimate two separate Cox proportional hazard models. One set of estimations is based on a Cox model in which the household status variables take on the values at the time of the exit, which provides insight into how these factors observed at the time a household acquires enough assets to exit asset poverty are related to the duration of the exit from asset poverty. The other set of estimations include time-varying covariates (TVC's) in a Cox model where the household status is allowed to change each period. The model with TVC's provides insight into how changes in the household status variables *after* a poverty exit might be related to the duration of the exit from asset poverty. When TVC's are included in the model, the survivor function, $S(t)$, becomes the product of successive survivor functions defined for each interval over which the TVC's may change.

The PSID data are a discrete representation of an essentially continuous process, so the Cox model must be modified because many failure events happen at identical times. We used the Efron (Efron 1977) method to handle tied cases with a robust standard error estimator (Lin and Wei 1989).

Endogeneity is a concern for our models because we include home and automobile ownership as dependent variables and they might be correlated with the error term if the unexplained differences that influence ownership decisions might also influence the duration out of asset poverty. For this reason, we only include home and automobile ownership at the time of

exit—and not as time varying covariates-- in the empirical models. Additionally, we have performed a robustness check and estimated all of the models without home and automobile ownership and the key results remain substantively the same. As a final robustness check we also re-estimated the TVC models replacing the initial period home and automobile ownership with time-varying home and automobile ownership. Again all of the key results that we will present remained unchanged. If these variables are endogenous, the degree of bias is not large enough to impact the main conclusions of this study.[3]

The Data

The data available for studying asset poverty dynamics are far less rich than those for income poverty because of the short history of collecting asset-holding information in longitudinal surveys. Only two nationally representative longitudinal surveys currently collect asset-holding information: the Survey of Income and Program Participation (SIPP) and the PSID. The SIPP data contain detailed monthly asset-holding information and very rich demographics on lower-income households and immigrants. However, SIPP is inappropriate for studying long-term asset poverty, because the length of its longest panel is only four years. Consequently, in this study we use the PSID—the most commonly used database for studying the dynamics of poverty (Cellini, McKernan et al. 2008). The PSID is a nationally representative longitudinal study with high response rates. The unit of observation in the PSID is a family unit, which is defined to be a group of people who are living together and share both income and expenses. The PSID family unit includes individuals who are cohabitating in the same housing unit, single person households and all persons related by blood residing in the same household. This definition of family unit is more inclusive than that

[3] Results of the robustness checks are available from the authors upon request.

used by the U.S. Census bureau, thus in what follows we use the term "household" to mean a PSID family unit.

Of key interest to the study is the asset module. Prior to 1999, the PSID module assessing assets and liabilities was only asked every five years. However, after 1999 the asset module was included biennially. Because we need frequent reports of assets in order to study the exits and subsequent reentries into asset poverty, we focus on the PSID asset module collected between 1999 and 2007.

While the asset poverty threshold is routinely defined as a level of assets equivalent to 25 percent of the federal income poverty level, there is less standardization in which assets are included in the calculation of assets. We attempt to explore asset poverty dynamics using different asset definitions found in the existing literature. Table 2 describes the components of assets for each of the four definitions we explored. The first definition (*Net Worth 1*) considers all measures of assets available in the PSID module for all sample years. The last three definitions are borrowed from the approach of Rank and Hirschl (Rank and Hirschl 2010) who also analyzed PSID data. The only difference between *Net Worth 1* and *Net Worth 2* is the inclusion of wealth associated with automobile ownership in *Net Worth 1*[4]. Automobile ownership is the only measure of durable goods available in the PSID asset module. Thus, *Net Worth 2* is still a highly inclusive measure of asset, but does not include durable goods. *Financial Wealth* differs from *Net Worth* 2 because housing wealth is excluded. *Liquid Wealth* considers only savings, stocks and bonds—excluding all business, real-estate, housing and durable goods related wealth. It measures the portion of the asset portfolio that is most immediately available to weather temporary income shortfalls.

[4] Automobile ownership is measured as the net market value of the vehicle: the value of the vehicle minus any outstanding debt on the vehicle.

The analysis focuses on households who exit asset poverty and seeks to determine which factors are most influential in a return to asset poverty. This requires identification of the period when a household exits from asset poverty—or the "exit period". The exit period is identified when a household who was asset poor in the previous period is observed to have acquired assets and become not asset poor. Thus, in order for households to be included in the analysis, a two-period pattern must be observed at some point during the sample period: being asset poor, then not being asset poor. Identification of the exit period is essential to our analysis for two reasons. First, we would like to examine the relationship between covariates observed at the time of exit and the duration of the exit. Second, the duration between asset-poverty exit and reentry is only known if the exit period can be identified. For this reason, any observations with left-truncation are not included in the analysis.[5]

The exit period may be identified for only a subsample of the households sampled in the PSID, and this subsample varies depending upon the definition of asset poverty used. Using PSID data from 1999 through 2007, we begin with a sample of 9,295 households for which complete asset information is available. Table 3 reports the asset characteristics of this sample for each definition of asset poverty. Depending upon the definition of asset poverty, 26 to 57 percent of the households were never in asset poverty while 24 to 53 percent of the households were always in asset poverty. The asset poverty dynamics for both of these types of households are not analyzed because the analysis is based upon the time between asset poverty exit and any subsequent reentry. Approximately 12 percent of the households exit asset poverty during our sample period,

[5] The larger availability of income data allowed Stevens (1999) to analyze the impact of the left-truncated observations. She found no evidence that excluding the left truncated observations biased her estimates of poverty transition. These results are suggestive that the necessity of excluding left-truncated observations is not a severe limitation for our study.

facilitating identification of the exit period. These households, excluding any households that have missing values for the covariates included in the models[6], make up our analysis sample.

Table 4 presents summary statistics on the subsamples according to the different definitions of asset poverty. Between 16 and 23 percent of each subsample is composed of households that were asset poor in 1994. Another 13 to 19 percent of households in each subsample were not asset poor in 1994. The remaining households formed since 1994. The subsamples contain more newly formed households than households who existed in 1994. It is likely that established households tend to remain asset poor or non-poor; therefore, their exit period cannot be identified. However, newly formed households tend to make more frequent moves in and out of asset poverty, and their exit period can be established for this study. The year of exit from asset poverty is split fairly equally across the three possible exit years: 2001, 2003 and 2005. The average age of the head of household is close to 40 for the two net-worth definitions of asset poverty, but is about five years older for the financial and liquid wealth definitions relating perhaps to the longer time necessary to accumulate assets when housing is not included in the definition of asset. African Americans have a higher representation in the subsamples when housing is included in the definition of asset (greater than 30 percent of the sample) than when housing is not included in the definition of asset (22 to 24 percent of the sample). Automobile ownership is over 80 percent across all samples; while homeownership among the *Networth 1* sample is only 43 percent compared with homeownership rates of 67 to 68 percent in the other samples. Because the value of automobiles is included in the definition of asset for *Networth 1*, households that do not own a home, but own one or more vehicles, are more

[6] The most frequent form of missing data that causes a household to be excluded from the final models is educational attainment. The PSID does not reassess this variable at every data administration; thus, it has a higher frequency of missing values.

likely to exit asset poverty under the *Networth 1* definition than the other, less inclusive, asset definitions. About half the households (44 to 51 percent) contain children less than 18 years old and most households (89 to 95 percent) have health insurance. The prevalence of health insurance increases as the definition of asset becomes more restrictive. Single female-headed households account for about 16 percent of the samples with *Networth 2* and *Liquid Wealth* definitions, but they account for a higher proportion (23 percent) of the sample with the *Networth 1* definition and a lower proportion (14 percent) of the sample with the *Financial Wealth* definition. Single male households, however, account for about 16 percent of each sample except the sample with *Liquid Wealth* definition where they represent only 14 percent.

The variables upon which we will focus most when discussing the results and conclusions of this study are related to our hypotheses. First, we hypothesized that a threshold of asset wealth might exist beyond which the likelihood of asset poverty reentry is significantly reduced. To analyze this relationship we include a measure of asset accumulation (*Threshold 0.75*). *Threshold 0.75* indicates households who were observed to have a level of assets equivalent to 75 percent of the income poverty level, 9 months worth of income at the income poverty line at the time they exited asset poverty. These households—between 40 and 60 percent of the sample for each definition of asset—had assets that were at least three times greater than the threshold needed to exit asset poverty. After initially examining the relationship between reentry and *Threshold 0.75*, we will explore alternative asset accumulation thresholds ranging from 50 to 131 percent of the income poverty threshold. Our second hypothesis deals with the relationship between a household's financial portfolio and asset poverty reentry. Two key variables are used to assess this relationship. *Portfolio* measures the percentage of total assets (based on the *Networth 1* definition) invested in more productive assets such as businesses, non-house real-estate, stocks or

bonds; and *Debt_ratio* measures non-mortgage debt as a percentage of total assets. The average value of *Portfolio* varies widely across the samples based on different definitions of asset, ranging from 8 percent (Net Worth 1 definition) to almost 20 percent (Financial Wealth definition). It is possible for Portfolio to be greater than 100 percent because the net house value (which may be negative) is included in the *Networth 1* definition of assets. *Debt_ratio* ranges from 0 to 100 percent in our samples. The average debt ratio in each of the samples is between 12 and 18 percent except in the sample based on the *Financial Wealth* definition of asset. For the *Financial Wealth* sample, the average debt ratio is only 6 percent of assets. Debt ratios indicate the degree to which a household has leveraged their asset positions. High debt ratios are generally associated both with greater risk exposure and less financial flexibility because the borrowing capacity of a household may be exhausted.

Results

Results for the estimated Cox models are reported as hazard ratios for ease of interpretation. A hazard ratio being greater than one indicates that an increase in the value of a variable increases the likelihood of returning to asset poverty, *ceteris paribus*. A hazard ratio being less than one indicates a decreased likelihood of reentry. The results from the first set of Cox proportional hazard models in which the household status variables are held constant at their values observed at the asset-poverty exit (during the period the household's assets are first observed to be above the asset poverty threshold) suggest factors observed *at the time of exit* that are related to a more sustainable exit, or, a lower chance of a subsequent reentry into asset poverty. In contrast, the TVC Cox model estimates the relationship between reentry and changes in the household status variables that occur *after the household exits* asset poverty.

Cox Proportional Hazard Model with Time Invariant Covariates

Table 5 presents the estimated hazard ratios for reentering asset poverty when the household status variables are held constant at their values at the time of exit from asset poverty. The variables of greatest interest relate to our two hypotheses and are listed first.

The covariates included in the model as controls behave as expected. We categorize households as being asset poor in 1994, not asset poor in 1994 or newly formed households that did not exist in 1994 (the reference group in our empirical model).[7] Households who were in asset poverty in 1994, and thus more likely to have a longer history of asset poverty prior to exiting asset poverty, are associated with a higher likelihood of reentering asset poverty—regardless of the definition of asset that is applied. Likewise, having an African American head, having lower income, and being a single female-headed household are all associated with a higher likelihood of reentry.

We focus first on the relationship between a household's financial portfolio and asset poverty reentry. Households who exit asset poverty with a higher debt ratio are associated with an increased likelihood of reentry for most definitions of asset. The exception to this is found in the Liquid Wealth models where *Debt_ratio* has no statistically significant relationship with asset poverty reentry. However, asset allocation towards more productive assets (*Portfolio*) is not statistically significant in any of the models.

Next we examine the estimated hazard ratios for asset accumulation above the asset poverty threshold. *Threshold 0.75* is statistically significant across all subsamples except those based on the Liquid Wealth definition of asset. *Threshold 0.75* identifies households that have assets equal to 9 months of income at the poverty line when they are observed to have exited from

[7] 1994 was the most recent year that asset data were available in the PSID prior to 1999.

asset poverty. In some ways the statistically significant coefficient estimates for *Threshold 0.75* are unsurprising: higher levels of assets should take longer to deplete and therefore reduce the likelihood of reentry. However, we would like to examine this relationship further to better understand the insulating effects of higher asset accumulation. To do so, we re-estimated the models in Table 5 and allowed *Threshold* to indicate different asset accumulation thresholds ranging from 50 to 131 percent of the income poverty line. The estimated hazard ratios with error bars at a 95 percent confidence level for *Threshold 0.50* through *Threshold 1.31* are displayed in Figure 1.

All estimates of hazard ratios in Figure 1 are smaller than one, and within some range around three times of the asset poverty threshold (*Threshold 0.75*), they are statistically significant. This suggests that asset accumulation thresholds within that range help prevent households from falling back to asset poverty. However, there is no clear linear relationship between the asset accumulation thresholds within that range and the likelihood of reentry. For all definitions of asset, the magnitude of the estimated hazard ratios for *Threshold* remains relatively constant as the asset accumulation thresholds increase. Thus we find evidence that higher asset accumulation thresholds reduce the likelihood of reentry, but the likelihood of reentering asset poverty is not sensitive to incremental increases in asset thresholds once the initial gain is realized.

TVC Cox Model

Next, we estimate Cox proportional hazard models while allowing the household status variables to vary each period.[8] The results of these models are presented in Table 6. The name for each of the variables that change over time is preceded by "TVC" to indicate that they are included in the model as a time-varying covariate. The coefficient estimates for these variables may now be interpreted as the change in the log-hazard ratio when the value of the variable "jumps" or changes from one data collection period to the next.

The covariates included in the model as controls have similar estimated relationships as in the previous Cox models. *Threshold 0.75* is statistically significant across all subsamples and the estimated hazard ratios are of similar magnitude as before. The main difference between the results from the TVC model and the previous Cox model estimates is the role of portfolio allocations and debt. Households who invested one percentage point more of their asset portfolio in productive assets (business, non-house real estate, stocks or bonds) are associated with a 0.7 to 0.9 percentage points reduction in hazard of reentry using the samples with Net Worth 1, Net Worth 2 and Liquid Wealth definitions of asset. This reduction of hazard becomes 1.5 percentage points when considering the sample with the Financial Wealth definition of asset. Changes in the debt ratio after the exit from asset poverty have a significant, inverse relationship with reentry. The largest hazard ratio between *TVC Debt_ratio* and reentry is seen in the sample with the *Net Worth 1* definition of asset—a 1 percentage point reduction in debt as a percent of assets is related to a 2.4 percentage points decrease in reentry hazard. The smallest hazard ratio—observed in the Liquid Wealth model—indicates that households that increase their debt as a proportion of asset by 1 percentage point are 0.5 percentage points more likely to reenter asset poverty. It is

[8] The exceptions are *Owner* and *Auto,* which are not allowed to vary because of concerns for endogeneity, as previously mentioned.

important to note that these effects are observed after controlling for asset accumulation (*Threshold 0.75)* and income (*TVC Income)*; thus, they are reflecting the relationship between reentry and changes in financial *allocations*.

Conclusions

The goal of this study was to examine households who had exited asset poverty and better understand the factors that influence the likelihood of asset poverty reentry. In particular, we examine the role of different levels of asset accumulation and the asset portfolio allocation. We found that for all definitions of assets, there are some threshold levels of high-earning assets above which households were less likely to experience to reenter a state of asset poverty. These thresholds of asset accumulation are higher than the commonly used asset poverty threshold. For all but the *Liquid Wealth* definition of assets, asset accumulation greater than or equal to 75 percent of the income poverty line has a statistically significant association with less reentry. The threshold levels necessary to observe a statistically significant relationship with asset poverty reentry for the Liquid Wealth models was considerable higher—119 percent of the income poverty line. This reflects the lower earnings on liquid assets relative to other asset types. Additionally, households who increase the proportion of productive assets (businesses, non-house real-estate, stocks or bonds) in their asset portfolios after an exit from asset poverty are associated with a lower chance of reentry while households who increase their debt ratio are associated with a higher chance of reentry.

The results for *Debt_ratio* and *Portfolio* are consistent with our hypothesis that asset portfolio allocations in productive assets might have an insulating effect on the maintenance of assets. However, the results might also be attributed to other omitted variables such as financial

sophistication, time and risk preferences, as well as changes in ownership of other types of assets. For example, when a household purchases or sells a home or an automobile, we do not necessarily observe the assets the household uses for the purchase or the new assets obtained with proceeds from the sale. Empirical evidence suggests that households deal with the risk associated with housing investments by reducing the risk associated with their other investments—such as decreasing the portion invested in stocks (Flavin and Yamashita 2002; Cocco 2005). However, our main results remain robust to the inclusion of time-varying home and automobile ownership indicating that at least for these types of assets, the correlation between the sale or acquisition of the assets and leveraging or portfolio allocationis not substantial enough to influence the results.

There are several additional caveats for interpreting the results. First, due to limitations in the availability of longitudinal asset data, we are only able to observe households for at most seven years after an exit from asset poverty, and assets are only assessed at two-year increments. This prevents us from observing any events or conditions that may have an impact longer than seven years, and anything that happened between the two-year survey increments. Second, the data is only available for a particular set of asset categories and is entirely self-reported, which might lead to errors in measuring assets. However, we do find that most of our key results are robust to the definition of asset used, indicating that perhaps this limitation is minimal.

Another limitation of the study might be the sample from which the data was drawn. Roughly 70 percent of the Net Worth 1 and 2 samples were households who formed since 1999 and this number only decreased to 60 percent for the Financial and Liquid Wealth definitions. Thus, there is significantly less representation of older, more established households. However, the purpose of the analysis was to study asset poverty reentry and the sample(s) we analyzed included all of the households enrolled in the full PSID sample for which reentry was a concern

during our observation period. Of greater concern are the households who were omitted from the analysis because of missing data for one or more of the covariates. The samples analyzed in the TVC Cox models are significantly smaller than those analyzed in the first set of Cox models because the data requirements of the TVC Cox model are greater. A missing value for one of the TVC covariates in any sample year between the time the household exits asset poverty and the time the household reenters asset poverty (or censoring occurs) will cause us to have to drop that observation from the analysis. To do some check for the influence of the reduced sample size in the TVC Cox model, we re-ran the first Cox models using the smaller sample available in the TVC model and obtained substantively similar results to those reported in Table 5. Results are available from the authors upon request.

Despite these concerns, the analysis points to promising areas for future research. We found limited support for Hypothesis 1 and the existence of a Micawber Threshold with regards to asset accumulation. Having a minimum level of assets of at least 75 percent of the poverty line was statistically associated with less reentry for all types of assets except for liquid assets for which data limitations prevent us from denoting the exact location of such a threshold. Data with more frequent observations of assets would be helpful in substantiating the observed relationship between different thresholds of asset accumulation and reentry. We found stronger support for Hypothesis 2, which suggested that portfolio allocations that are more weighted towards higher-earning assets lower the chance of reentry. Nevertheless, the role of productive assets and debt as a proportion of the asset portfolio should be more closely examined to determine if causal relationships between these aspects of portfolio allocation and reentry can be established.

The results are highly relevant for policies aimed at improving the sustainability of assets for households that have recently exited asset poverty. These households are more likely to face

real or perceived incentive structures that are inconsistent with the maintenance of asset levels in several ways. For example, some households may still have lower income and lower assets to build upon. Also some households may have no access to or be unfamiliar with employer supported retirement savings, and asset-building programs such as the Earned Income Tax Credit and Individual Development Accounts. Many households are not be eligible for itemizing deductions on their tax returns because of their income and therefore cannot benefit from mortgage interest and other deductions. And having adequate assets may make them ineligible for public assistance programs, reducing the incentive for poorer households to be more prudent about accumulating assets. As these households accumulate assets, they need to move beyond programs that help build wealth for lower income households and engage in risk management and invest in more productive assets. New policy programs should be considered to help bridge this transition for households. In addition, the results of the study support the importance of advice provided by professional financial counselors that focuses on asset portfolio allocation and debt reduction. The results also suggest a role for programs that improve support and encouragement for households as they continue to build assets beyond the conventional asset poverty level, or assets equivalent to 25 percent of the income poverty level. The results showed a lower chance of reentering asset poverty when families acquired assets equal to at least 75 percent of the income poverty level.

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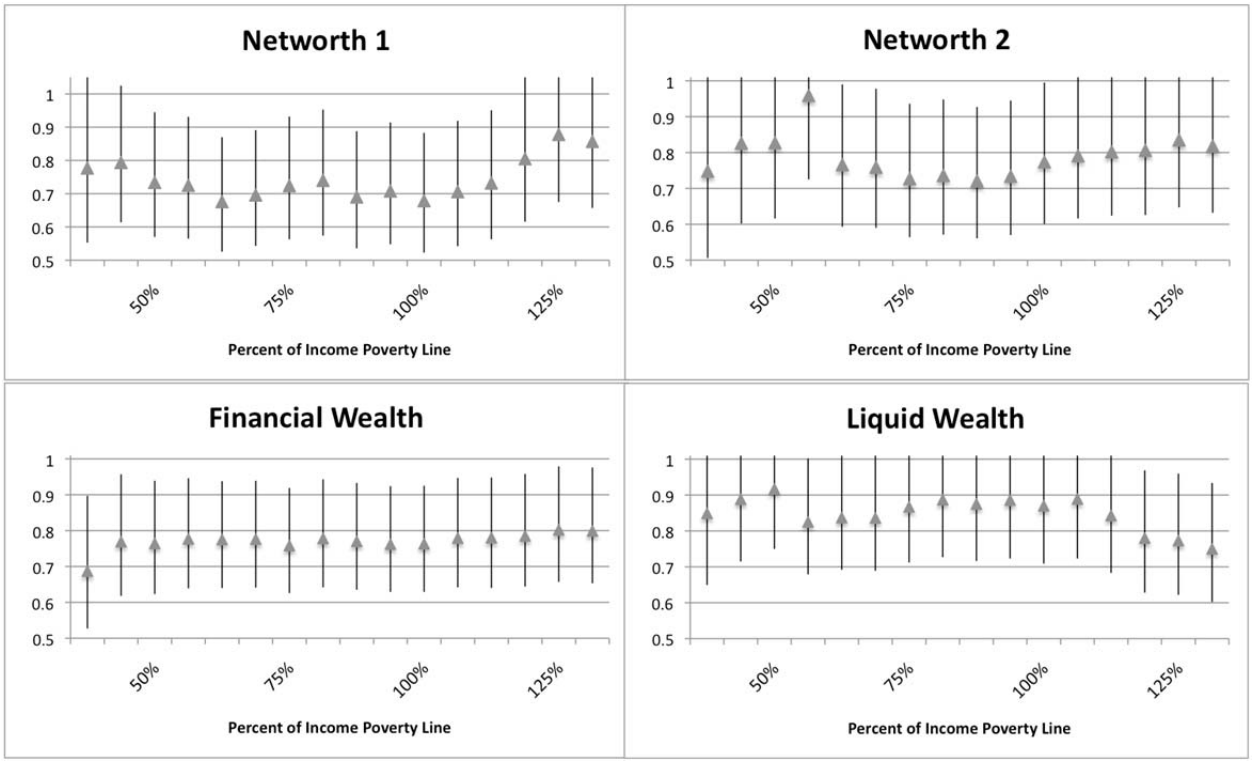
Figure 1. Relationship between Asset Accumulation Thresholds and Asset Poverty Reentry



Note: Hazzard ratio point estimates are plotted with error bars indicating a 95 percent confidence interval.

Table 1. Description of Variables Used in the Cox Model

Variable	Description
Variables Characterizing the Exit from Asset Poverty	
Threshold 0.75	Indicator for asset accumulation that is greater than or equal to 75 percent of the poverty line
Poor94	Household observed to be in asset poverty in 1994
Not_poor94	Household not asset poor in 1994
Exit01	Exited Poverty in 2001
Exit03	Exited Poverty in 2003
Exit05	Exited Poverty in 2005
Household Demographics	
Head_age	Age of head
Black	Race of head isblack
Hispanic	Ethnicity of head isHispanic
Household Status Variables	
Auto	Household owns at least one automobile
Home_Owner	Homeowner
Kids	Household with members younger than18 years
Education	Years of education
Bad Health	Self-reported overall health (1=good; 5=bad)
Health Insurance	At least one member of household has health insurance
Income	Natural log of income per member in household
Single_female_head	Only one female adult in household
Single_male_head	Only one male adult in household
Kids:Single_female_head	Interaction of *Kids* and *Single_female_head*
Kids:Single_male_head	Interaction of *Kids* and *Single_male_head*
Portfolio	Percentage of all assets (*Net Worth 1* definition, not including debts)invested in business, non-house real estate, stocks or bonds
Debt_ratio	Non-mortgage debt as a percentage of all assets (*Net Worth 1* definition, not including debts)

Table 2. Asset Definitions

Wealth Type	Items Included
Net Worth 1	Automobiles, net value of one's home, non-home real estate holdings, farm and business assets, checking and savings accounts, other savings such as bond funds, stocks, debts (subtracted from total assets)
*Net Worth 2**	Net value of one's home, non-home real estate holdings, farm and business assets, checking and savings accounts, other savings such as bond funds, stocks, debts (subtracted from total assets)
*Financial Wealth**	Non-home real estate holdings, farm and business assets, checking and savings accounts, other savings such as bond funds, stocks, debts (subtracted from total assets)
*Liquid Wealth**	Checking and savings accounts, other savings such as bond funds, stocks

*Source: Rank and Hirschl (Rank and Hirschl 2010)

Table 3. Asset Characteristics of PSID Households (N=9,295)

	Asset Poverty Definition			
	Networth 1	**Networth 2**	**Financial Wealth**	**Liquid Wealth**
Never observed to be in asset poverty	5311 (57.1%)	4278 (46%)	2395 (25.8%)	2819 (30.3%)
Always observed to be in asset poverty	2201 (23.7%)	3302 (35.5%)	4937 (53.1%)	4618 (49.7%)
Observed to have entered asset poverty but have not exited	551 (5.9%)	454 (4.9%)	588 (6.3%)	569 (6.1%)
Exit period cannot be established due to non-response	134 (1.4%)	170 (1.8%)	141 (1.5%)	122 (1.3%)
Observed to have exited asset poverty (exit period can be established)	**1074 (11.6%)**	**1069 (11.5%)**	**1217 (13.1%)**	**1155 (12.4%)**

Table 4. Summary Statistics of the Subsample from PSID

Variable	Net Worth 1 Sample (N=1022)			Net Worth 2 Sample (N=1004)			Financial Wealth Sample (N=1175)			Liquid Wealth Sample (N=1137)		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Variables Characterizing the Exit from Asset Poverty												
Threshold 0.75	0.552	0	1	0.626	0	1	0.561	0	1	0.412	0	1
Poor94	0.156	0	1	0.209	0	1	0.22	0	1	0.226	0	1
Not_poor94	0.141	0	1	0.134	0	1	0.18	0	1	0.187	0	1
Exit01	0.304	0	1	0.305	0	1	0.298	0	1	0.343	0	1
Exit03	0.354	0	1	0.375	0	1	0.357	0	1	0.325	0	1
Exit05	0.341	0	1	0.32	0	1	0.345	0	1	0.332	0	1
Household Demographics												
Head_age	39.2	19	96	39.8	19	96	44.6	19	96	44.4	19	96
Black	0.375	0	1	0.306	0	1	0.223	0	1	0.237	0	1
Hispanic	0.085	0	1	0.088	0	1	0.069	0	1	0.055	0	1
Household Status Variables												
Auto	0.876	0	1	0.841	0	1	0.898	0	1	0.9	0	1
Home_Owner	0.432	0	1	0.668	0	1	0.681	0	1	0.676	0	1
Kids	0.514	0	1	0.512	0	1	0.444	0	1	0.449	0	1
Education	12.5	0	17	12.8	0	17	13.3	0	17	13.4	1	17
Bad Health	2.422	1	5	2.344	1	5	2.305	1	5	2.309	1	5
Health Insurance	0.891	0	1	0.925	0	1	0.938	0	1	0.948	0	1
Income	9.60	4.84	13.10	9.78	5.86	13.10	10.02	5.99	13.10	10.0	3.93	13.10
Single_female_head	0.23	0	1	0.167	0	1	0.139	0	1	0.162	0	1
Single_male_head	0.167	0	1	0.158	0	1	0.166	0	1	0.141	0	1
Kids:Single_female_head	0.123	0	1	0.082	0	1	0.046	0	1	0.057	0	1
Kids:Single_male_head	0.016	0	1	0.016	0	1	0.017	0	1	0.012	0	1
Portfolio	0.084	0	2.39	0.127	0	2.39	0.196	0	1.31	0.103	0	1.31
Debt_ratio	0.156	0	0.94	0.121	0	0.87	0.061	0	0.83	0.186	0	1

Table 5. Estimated Hazard Ratios for Reentering Asset Poverty using Time-Invariant Covariates

	Net Worth 1	Net Worth 2	Financial Wealth	Liquid Wealth
Threshold 0.75	0.724**	0.727**	0.758***	0.867
	(0.0931)	(0.0939)	(0.0742)	(0.0866)
Portfolio	0.996	1.001	1.000	0.996
	(0.00287)	(0.00238)	(0.00173)	(0.00245)
Debt_ratio	1.005*	1.007**	1.009**	1.001
	(0.00287)	(0.00347)	(0.00346)	(0.00173)
Poor94	1.352**	1.442**	1.345**	1.445***
	(0.207)	(0.226)	(0.155)	(0.175)
Not_poor94	1.089	1.079	1.073	1.002
	(0.196)	(0.216)	(0.143)	(0.148)
Exit01	0.950	1.101	1.192	1.002
	(0.149)	(0.184)	(0.152)	(0.130)
Exit03	0.966	1.129	1.265**	1.226*
	(0.139)	(0.169)	(0.145)	(0.145)
Head_age	0.999	0.986*	0.993	0.998
	(0.00690)	(0.00739)	(0.00605)	(0.00625)
Head_age squared	1.000	1.000	1.000	1.000
	(0.000294)	(0.000269)	(0.000182)	(0.000187)
Black	1.342**	1.448***	1.234**	1.352***
	(0.171)	(0.186)	(0.130)	(0.145)
Hispanic	1.068	0.714	0.837	1.084
	(0.246)	(0.194)	(0.169)	(0.244)
Education	0.980	0.954*	0.993	0.962
	(0.0250)	(0.0258)	(0.0203)	(0.0226)
Kids	0.811	1.063	0.950	1.084
	(0.140)	(0.185)	(0.119)	(0.139)
Bad Health	0.989	1.043	0.891**	0.932
	(0.0546)	(0.0658)	(0.0454)	(0.0510)
Insurance	0.878	0.980	1.214	0.832
	(0.157)	(0.230)	(0.263)	(0.174)
Auto	0.603***	0.721**	0.790*	0.945
	(0.0939)	(0.104)	(0.107)	(0.157)
Income	0.796***	0.927	0.901	0.874*
	(0.0600)	(0.0769)	(0.0610)	(0.0623)
Home_Owner	0.541***	0.484***	0.813*	0.857
	(0.0769)	(0.0697)	(0.0893)	(0.0977)
Single_female_head	1.442*	1.288	1.090	1.012
	(0.296)	(0.294)	(0.180)	(0.181)
Single_male_head	1.216	1.199	1.012	1.207
	(0.240)	(0.240)	(0.154)	(0.202)
Kids:single_female_head	1.098	0.934	1.253	1.483
	(0.290)	(0.280)	(0.300)	(0.369)
Kids:single_male_head	0.977	1.016	0.869	0.765
	(0.507)	(0.481)	(0.343)	(0.386)
Observations	1,022	1,004	1,175	1,137

Robust standard errors in parentheses * p<0.10 ** p<0.05 *** p<0.01

Table 6. Estimated Hazard Ratios for Reentering Asset Poverty using Time-Varying Covariates

	Net Worth 1	Net Worth 2	Financial Wealth	Liquid Wealth
Threshold0.75	0.656***	0.721***	0.762***	0.842*
	(0.0687)	(0.0822)	(0.0628)	(0.0792)
Portfolio	0.992***	0.993***	0.985***	0.991***
	(0.00244)	(0.00280)	(0.00297)	(0.00272)
Debt_ratio	1.024***	1.022***	1.014***	1.005***
	(0.00128)	(0.00135)	(0.00110)	(0.00141)
Poor94	1.158	1.258	1.196*	1.188
	(0.160)	(0.186)	(0.126)	(0.135)
Not_poor94	0.858	0.859	0.921	0.823
	(0.138)	(0.157)	(0.117)	(0.119)
Exit01	1.263*	1.325*	1.372***	1.106
	(0.177)	(0.204)	(0.168)	(0.138)
Exit03	1.142	1.317**	1.436***	1.332**
	(0.147)	(0.183)	(0.162)	(0.153)
Head_age	1.009	1.000	0.997	1.001
	(0.00600)	(0.00730)	(0.00542)	(0.00608)
Head_age squared	1.000	1.000	1.000	1.000
	(0.000281)	(0.000305)	(0.000190)	(0.000179)
Black	1.494***	1.518***	1.349***	1.356***
	(0.152)	(0.177)	(0.126)	(0.138)
Hispanic	1.308	0.729	0.730	1.051
	(0.318)	(0.216)	(0.156)	(0.244)
Auto	0.611***	0.894	1.268*	0.873
	(0.0872)	(0.127)	(0.180)	(0.141)
Home_Owner	0.657***	0.506***	0.949	0.887
	(0.0786)	(0.0617)	(0.0960)	(0.0974)
TVC Education	0.957**	0.931***	0.970*	0.947***
	(0.0208)	(0.0229)	(0.0174)	(0.0190)
TVC Bad_health	0.782	0.947	0.844	0.666**
	(0.136)	(0.187)	(0.135)	(0.119)
TVC Insurance	0.773***	0.792***	0.841***	0.780***
	(0.0266)	(0.0291)	(0.0474)	(0.0411)
TVC Income	1.170	1.064	0.980	1.104
	(0.171)	(0.158)	(0.112)	(0.135)
TVC Kids	1.085*	1.084	1.049	1.021
	(0.0531)	(0.0555)	(0.0444)	(0.0525)
TVC Kids:single_female_head	0.627**	0.756	1.267	1.463*
	(0.131)	(0.213)	(0.258)	(0.315)
TVC Kids:single_male_head	0.851	1.979*	1.152	1.087
	(0.372)	(0.711)	(0.389)	(0.410)
TVC Single_female_head	2.043***	1.606**	1.328**	1.009
	(0.313)	(0.309)	(0.179)	(0.161)
TVC Single_male_head	1.398*	1.276	1.107	1.224
	(0.255)	(0.242)	(0.158)	(0.195)
Number of Subjects	794	815	970	962

Robust standard errors in parentheses * p<0.10 ** p<0.05 *** p<0.00