Using Panel Data to Examine Racial and Gender Differences in Debt Burdens

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Abstract

Debt burdens have risen for U.S. households over the last several decades. As a result, several studies have investigated potential ethnic and gender differences in these debt burdens, along with the risks they pose. However, these time-invariant demographic characteristics may potentially be correlated with unobserved heterogeneity among households, rendering typical estimation results biased. In this paper I use the Hausman-Taylor estimates for panel data to estimate the relationship between these time-invariant demographics and debt burdens, allowing for potential correlation between some variables and the unobserved heterogeneity. I also apply some practical guidelines in determining both whether to use the HT estimator, as well as in determining appropriate instruments. Using data from the NLSY79, the resulting estimates differ substantially from those of a typical random effects GLS estimator. In particular, the HT results find fewer gender differences, but actually more differences for black and Hispanic households.

Keywords: Debt Burdens, Gender, Race, Hausman-Taylor, Panel Data

JEL-Codes: C23, D12, J15, J16

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Introduction

Household debt has been steadily rising in the U.S. for two decades, from the early 1980's through 2008, though it has recently leveled off and fallen just a bit. In mid-2011, the household total debt to after-tax income ratio stood at 1.14, down from a peak in late 2007 of 1.30, but still well above the 0.85 it was in the 1990's (Lahart & Light, 2011). Many factors have been argued to have been associated with this climb including changes in the availability of debt, a housing market bubble, increasing schooling costs, greater income uncertainty, cultural factors, risks household face in dealing with future financial shocks and as well as even stress and martial dissolution (Dynan and Kohn, 2007; Morris 2011; Tippett, 2010). When examining the rise and impacts of household debt and its burden, it is common to consider differences between difference socio-economic and demographic groups, including ethnic and gender differences (De'Armand and Zhu, 2011; Price, 2004; Rapoport 1999; Tippett, 2010). However, most typical methods of estimating differences between ethnic and gender groups run a high risk of bias due, in particular, to the potential correlation between these variables and unobserved heterogeneity.

In this paper, I use panel data from the NSLY79 to aid in controlling for unobserved heterogeneity in debt outcome, applying the Hausman-Taylor (HT) estimator to estimate regressions of demographic and other variables on debt measures. I also discuss steps taken to help determine if the HT estimates are valid. In all cases, specification tests suggest using the HT estimator to examine the coefficients on demographic variables related to gender and ethnicity are often very different when compared to standard pooled ordinary least squares (OLS) or random effects GLS estimation (RE). In particular, the HT estimates are less likely to find gender differences in debt ratios, but more likely to find differences for black and Hispanic households.

` The next section of the paper gives a brief overview of the literature on rising debt burdens. Section three presents the empirical methodology used in the paper. Section four reviews the data used. Section five presents the results and the final section concludes the paper.

Households and Debt

Debt can allow a household investment opportunities and consumption smoothing not available to them without access to credit markets (Modigliani, 1966). Such potentially beneficial reasons to acquire debt include home purchases, education funding, and smoothing over temporary labor shocks. In fact, studies have shown just such issues can help explain some of the rise in debt. Policy changes made credit more available (Johnson, 2007), including relaxation of mortgage lending standards and rising real estate prices. Rising education costs and medical costs have been shown to contribute to higher debt levels (Himmelstein, et. al. 2009), as has unemployment spells (Sullivan, 2008). While these are just the sort of uses debt availability is meant to aid, if such costs and unemployment spells linger while earnings to not rebound, households can be a risk of bankruptcy and lingering financial struggles due to the acquired debt burdens.

Beyond the standard life-cycle model motivations for debt, additional household demographic factors have been shown to be associated with debt levels including marriage and raising children (Xiao and Yao, 2011) as well as divorce (Fisher and Lyons, 2006; Morris 2011). Many studies also delve into gender, racial and ethnic differences in debt burdens (De'Armond and Zhu, 2011; Price 2004; Rapoport, 1999). While some authors attribute this to cultural differences and attitudes toward debt (Schooley and Worded, 2010), others have sounded concern for the possible presence of discriminatory issues related to minorities and debt, including higher risks for sustained negative shocks and the role of debt in increasing inequality (Wolff, 2007). Furthermore, some studies have found differences in debt management between men and women (Field, 2007). It is, however, in looking at such demographic

variables, however, that estimating effects becomes increasingly tricky. And yet, if there are conclusions and potential policy implications being drawn by findings of these differences, then correctly estimating them becomes even more important.

Empirical Methodology

The primary focus here is using panel data to examine debt burden differences related to time-invariant demographics such as gender and ethnicity. However, often the first step in most studies across demographic groups is to compare mean or median levels to give a first glance at whether broad differences might exist. As such, the first step done here is to consider simple tests of differences in means (T-Test) or medians (Wilcoxon-Mann-Whitney) in debt burdens. Since these broad results clearly mask other differences between the groups that can explain debt burden differences, they are presented primarily for reference, while the regression techniques described next are considered in more detail.

The basic empirical panel regression model here for $i = 1, \dots, N$ individuals observed across $t = 1, \dots, T$ time periods, expressed in terms of Hausman and Taylor (1981), is given by the following equation:

$$Debt_{it} = X_{it}'\beta + Z_i'\gamma + \mu_i + v_{it} \quad (1)$$

where μ_i is IID $(0, \sigma_\mu^2)$ and v_{it} is IID $(0, \sigma_v^2)$. The first element of the error term, μ_i, measures a time-invariant, individual specific unobserved heterogeneity. X_{it} is a vector of time-varying regressors and Z_i is a vector of time-invariant regressors.

If all the regressors in (1) are not correlated with either μ_i or v_{it}, then simply estimating with OLS will give consistent results. Using the standard Random Effects (RE) GLS estimation, however, can

gain efficiency and improve on the estimators (Baltagi, 2008). However, the consistency of both the RE and OLS hinge on none of the observed regressors being correlated with the unobserved heterogeneity, μ_i. If there is such correlation, then these estimates are biased.

To deal with potential correlation between regressors and unobserved heterogeneity, the Fixed Effect (FE) estimator can be used, which is just performing a regression on the individual time-demeaned transformation of the variables (i.e. $Debt_{it} - \sum_t Debt_{it}/T$, etc…). The estimates will then be consistent, as long as the regressors are uncorrelated with v_{it}. However, any time-invariant variables will reduce to zero when time-demeaned, so the FE estimator is of no use when the coefficients of interest are on time-invariant variables.

Hausman and Taylor (HT) (1981) proposed an instrumental variables (IV) estimator to consistently estimate the full set of parameter estimates in (1) when some of the variables are correlated with μ_i. Following their notation, let $X_{it} = [X_{1it}, X_{2it}]$ and $Z_i = [Z_{1i}, Z_{2i}]$, where X_{1it} and Z_{1i} are assumed to be exogenous (i.e. uncorrelated with μ_i and v_{it}) while X_{2it} and Z_{2i} are assumed to be endogenous (i.e. allowed to be correlated with μ_i, though still uncorrelated with v_{it}). The HT estimator works by using X_{1it} for Z_{2i}, so it can be used as long as the number of variables in X_{1it} is at least as great as those in Z_{2i} (see Baltagi (2008) for more details).

In deciding which estimator is superior, the key difference is in whether there is correlation between any of the regressors and the unobserved heterogeneity. In this paper I will follow the procedure suggested by Baltagi, Bresson & Pirotte (2008). The first step is to run the RE and FE estimators and then conduct a Hausman (1978) specification test on the exogeneity of regressors to μ_i based on the difference in the estimates. If the exogeneity assumption cannot be rejected, then the RE estimator is the one to use. However, if the exogeneity assumption is rejected, then the RE is inconsistent. In this case, the HT estimator is considered. The HT estimator is then considered consistent if it passes a second Hausman specification test based on comparing the HT estimates with

the FE estimates, testing if whether to reject the assumed exogeneity of X_{1it}. As an added robustness check, I get HT estimates for several different choices of X_{i1} that pass the Hausman test, in the end selecting sets that seemed reasonable and were associated with low chi-square statistics from the Hausman test.

There still remains the issue of appropriately partitioning X_{it} and Z_i into exogenous and endogenous components. The starting point is to consider time-varying variables that seem less likely to be related to the remaining unobserved heterogeneity in debt accumulation. Then, the Hausman test can be used as a test to see if the exogeneity assumption can be rejected. Beyond just satisfying the exogeneity, however, there is still a concern that X_{i1} could be weak set of instruments, in which case the resulting estimates could be biased and the estimated standard errors too small (i.e. too likely to find them statistically significant). While Baltagi and Khanti-Akon (1990) suggest looking at correlations between X_{i1} and $Z_{i2}$to examine this, I consider the Stock and Yogo (2005) minimum eigenvalues threshold on the first stage of a 2SLS of $\hat{\mu}_i$ on $Z_i = [Z_{1i}, Z_{2i}]$ using X_{i1} to instrument for Z_{2i}, where $\hat{\mu}_i$ is the predicted time-invariant individual error term, based on the FE estimator, since this the step in the HT estimator to get estimates for γ.

Data

The data come from the National Longitudinal Survey of Youth 1979 (NLSY79). This original panel consisted of 12,686 men and women aged 14-22 in 1979, making them 43-52 in 2008, the last wave used for analysis in this study. These individuals were interviewed annually until 1994, and biennially since. While the stated primary focus of the data is on labor force behavior, the data contain a relatively rich set of information including demographic variables, marriage and fertility, and asset and debt information. For a summary of the variables used in this study see Table 1. The variables include ethnic, gender and demographic variables, along with additional variables previously found to be

important in determining debt levels including education, unemployment, divorce, and others as discussed in the prior household and debt section of the paper. The final sample size used for panel estimation consists of 9,931 individuals observed 1 to 13 times giving just over 70,000 respondent-year observations[2].

The NLSY79 first collected information on debt and assets in 1985 and regularly thereafter. While the level of detail regarding the nature of the debts varied, amounts of mortgage and residential debts, along with car, business and "other debt" was collected each time, though there is not regularly detailed information on the nature of the other debt (credit cards, education loans, etc…)[3]. For this study, I examine total debt as well as non-collateral (NC) debt, which is measured as all non-housing, non-business, non-car debts. The debt amounts are in units of $100,000 and adjusted into real 2008 values using the CPI[4].

Information on income, assets and interest rates are also used as these financial variables can clearly impact debt decisions. Income is measured from the household net income key variable in the NLSY79 and assets are computed as the sum of all assets reported[5]. Both income and assets are adjusted into 2008 values using the CPI and are also in units of $100,000. The income and asset data are also used to create measures of the amount of debt burden a household faces by creating ratios of debt and NC debt to income and debt and NC debt to assets. Interest rates are the annualized average interest rates given by the Federal Reserve Board (2011) for 30-yr fixed rate mortgages (used in regressions when examining total debt) and prime interest rates (used in regressions examining NC debt).

[2] To be included a respondent must provide information on all variables used in a given year. In addition a few extreme outliers were removed (less that 0.25% of sample).
[3] Beginning in 2004 more detailed information regarding credit card debt and outstanding student loans was collected.
[4] The scaling to $100,000 is done to make estimated coefficient sizes consistent across variables to aid in computation of the Hausman specification tests.
[5] Similar to debt information, information on housing, vehicle, business and "other" assets are regularly collected. In later years the "other" category received some more detailed breakdown into retirement assets, other stocks, etc…

Two employment variables are used. First, Employed is an indicator measuring whether the respondent worked for pay in the last week. Second, Weeks Unemployed measures how many weeks the respondent was unemployed over the past year. Listing zero for both indicates that the respondent was not in the labor force (at least the past week), since to be considered unemployed you must be actively seeking work. A variable gauging health, Health Problem, is an indicator of whether the respondent's health limited the work they were able to do.

Demographic information regarding education and family situation is also considered. Two education variables are used: whether the respondent completed high school or not, and whether the respondent had four or more years of college. Married indicates if the respondent is currently married or not and additional indicators are used for being recently (between interviews) married or divorced. Further demographic variables used include the gender and racial variables we wish to investigate in detail (sex, black and Hispanic), the number of children the respondent has, as well as current living location (northeast, northcentral or west; zero on all three indicates living in the south), and whether the respondent was born in the south.

Results

As a starting reference point, Table 2 shows the results from a simple T-test of difference in means. The results from comparing medians were similar and not shown here. When considering ethnic differences, these basic tests suggest lower total debt for black households, resulting in lower debt to income ratios. However, the debt to asset ratio is higher, reflecting even lower assets levels among black households. Hispanic households show no statistically significant differences in debt levels, but do have higher debt to income ratios, reflecting lower incomes, and slightly lower debt to asset ratios, suggesting slightly higher relative savings. Lastly, women statistically show higher levels of debt,

and associated higher debt to income and debt to asset ratios. I not turn to see how those results hold up when controlling for a variety of other factors using the regression techniques discussed above.

Table 3 shows the results for OLS, RE, FE and HT estimates on debt to income ratios. The OLS and RE estimates give similar results as expected, and both find a lower debt to income ratio for black households, higher for females, and no difference for Hispanic households. However, the Hausman test on the exogeneity of the regressors to the unobserved heterogeniety in the RE estimation is rejected at p<0.001, so the results cannot be used with confidence. The HT estimator used here is based on X_1 = (Employed, Weeks Unemp., Children, 4-Year College, Urban) being used to instrument for Z_1 = (Black, Hispanic and Female). The Hausman test of the HT estimator gives a p value of 0.983, suggesting the instruments are appropriate. The minimum eigenvalue also passes the Stock-Yago threshold for relative bias at below 5%, again suggesting an appropriate instrument. The HT results find an even larger decrease in debt to income ratio for black households, but now find a positive difference for Hispanic households and no longer find a statistically significant difference for women. These results were robust to several other choices of X_1 that passed the Hausman test, as were the other HT estimates presented later.

All of the estimates relating to NC Debt to income ratios find women have statistically higher ratios, and none find a statistically significant difference for Hispanic households. However, RE finds a non-statistically significant negative coefficient for black households while the HT has a significant positive coefficient, suggesting for higher NC Debt to income ratios in black households once other factors are controlled for. The RE estimates fail the Hausman test at a p<0.01 level while the Hausman test for the HT estimator has a p value of p=0.9844, suggesting the HT estimates are preferred. Again the minimum eigenvalue passes the Stock-Yogo threshold at the 5% level, also supporting the HT estimator as an appropriate estimator.

Table 5 presents the results for debt to asset ratios. The RE results suggest a higher ratio for women, but have non-significant negative coefficients for black and Hispanic. However, once again the RE estimator fails the Hausman test at a $p<0.001$ level. The HT estimates are different on all three demographic variables: showing higher ratios for black households, lower for Hispanic, and no significant difference for women. The Hausman test of the HT estimates has a p value of $p=0.9927$ and the minimum eigenvalue passes the Stock-Yogo threshold at the 5% level. The estimates on NC Debt to asset ratios show a similar pattern with the RE estimates finding no difference for black and Hispanic households while the HT estimates suggest higher ratios for black households and lower for Hispanic households. This time, however, neither the RE nor the HT finds a statistically significant difference for women. Like with the other estimates, the RE estimates fail the Hausman test at a $p<0.001$ level while the test for the HT estimates has a p-value of $p=0.9999$ and again satisfies the Stock-Watson minimum eigenvalue criteria.

Results for estimating debt levels instead of the burden ratios are shown in Tables 7 and 8. Like with the previous dependent variables, the HT estimates give very different results when compared to the RE and OLS estimators. While both the RE estimates and the HT estimates suggest lower debt levels for black households, the RE estimate also suggest lower levels for Hispanic households while the HT estimate finds a positive relationship. Also, the RE estimate shows no statistically significant difference for women, while the HT estimates suggest lower levels for women. Lastly for NC Debt levels, the RE estimates show no statistically significant coefficient on black, Hispanic or women, while the HT finds a negative relationship for blacks, positive for Hispanics, though also no difference for women. In both cases the Hausman test rejects the RE estimates at a $p<0.01$ level while the HT estimates have p values above $p=0.95$.

Conclusion

In this paper panel data the Hausman-Taylor estimator is used to estimate the relationship between time-invariant demographic characteristics and household debt burdens. The results suggest that typical estimation methods regarding these variables may be biased due to correlations with unobserved heterogeneity, which the HT estimator can help deal with. In fact, many of the estimate results are noticeable different, suggesting the need for caution when interpreting results related to such demographic characteristics.

As for the estimated impacts, the HT actually find little difference between men and women on most debt measures, in contrast with the other estimates which find women have higher debt to income and debt to asset ratios. All results, however, show women with higher non-collateral debt to income ratio, while the HT estimates suggest a lower overall debt level for women, which is again in contrast to the findings of the other estimators. For black households, all estimates find lower debt levels and debt to income ratios. However, the HT estimates also find higher debt to asset ratios, and a higher non-collateral debt to income ratio, while the RE estimates find these effects to be insignificant. As such, the HT estimates paint a more differentiated picture with regard to debts relative to assets. For Hispanic households the HT estimates once again find statistically significant effects that were not shown by the RE estimates.

Given the striking difference in some of the estimators, it seems advisable to consider using a HT approach when looking at time-invariant demographic variables. However, while care was taken in selecting appropriate variables to be the exogenous instruments in the HT estimator using Hausman specification tests and the Stock-Yogo minimum eigenvalue tests, there are still potential concerns with the estimates. The Hausman test used to determine the appropriatness of the exogeneity assumption relies on only estimates of the time-varying variables. As such, there could remain potential bias due to inappropriate instruments with regards to the time-invariant variable coefficients. Furthermore, while

the Stock-Yogo criteria was met, other examination of the strength of the instruments, such as Shea's adjusted R^2, might raise some concerns.

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Table 1: Summary Statistics

	Mean	Std. Dev.	Min.	Max.
Debt to Inc. Ratio	0.846	1.772	0	43.5
NC Debt to Inc. Ratio[a]	0.154	0.973	0	31.7
Debt to Asset Ratio	0.673	2.091	0	48.3
NC Debt to Asset Ratio[a]	0.357	2.041	0	48.3
Debt[b]	0.437	0.776	0	14.3
NC Debt[a,b]	0.050	0.332	0	9.43
Employed	0.976	0.150	0	1
Weeks Unemployed	2.76	8.131	0	52
Health Problem	0.073	0.261	0	1
Married	0.360	0.480	0	1
Recent Married	0.024	0.154	0	1
Recent Divorce	0.023	0.150	0	1
Children	1.335	1.325	0	7
4-Years College	0.174	0.378	0	1
High School	0.846	0.360	0	1
Age	31.408	6.744	20	52
Assets[b]	1.349	3.107	0	42.99
Income[b]	0.553	0.700	0	12.87
Mortgage Interest	8.775	1.822	5.84	12.42
Prime Interest	7.982	1.854	4.34	10.87
Urban	0.785	0.410	0	1
Northeast	0.174	0.379	0	1
Northcentral	0.232	0.422	0	1
West	0.195	0.396	0	1
Born South	0.384	0.486	0	1
Black	0.251	0.434	0	1
Hispanic	0.157	0.364	0	1
Female	0.494	0.499	0	1

[a] NC Debt refers to Non-Collateral Debt

[b] Measured in $100,000 units

Table 2: T-Tests of Difference in Means

	Debt to Inc. Ratio	NC Debt Inc. Ratio[a]	Debt to Asset Ratio	NC Debt to Asset Ratio[a]	Total Debt[b]	NC Debt[a,b]
Black	0.599	0.171	0.711	0.433	0.236	0.045
Non-Black	0.934	0.148	0.661	0.332	0.518	0.053
T-Statistic	-26.594***	2.748**	3.092**	6.419***	-66.533***	-3.505***
Hisapnic	0.911	0.163	0.635	0.322	0.429	0.050
Non-Hispanic	0.833	0.152	0.682	0.365	0.440	0.051
T-Statistic	4.467***	1.211	-3.078**	-2.918**	-1.673	-0.498
Female	0.905	0.172	0.730	0.390	0.457	0.054
Male	0.785	0.135	0.615	0.323	0.417	0.048
T-Statistic	10.427***	5.864***	9.110***	5.451***	9.089***	3.341***

*p<0.05, **p<0.01, ***p<0.001

[a] NC Debt refers to Non-Collateral Debt

[b] Debt levels measured in $100,000 units

Table 3: Results for Debt to Income Ratio

	OLS	RE	FE	HT[a]
Employed	-0.3058**	-0.3569***	-0.4678***	-0.4610***
	(0.1181)	(0.0476)	(0.0541)	(0.0534)
Weeks Unemp.	-0.0005	0.0014	0.0035***	0.0035***
	(0.0013)	(0.0009)	(0.0010)	(0.0010)
Health Problem	0.0649	0.0602*	0.0791*	0.0722*
	(0.0371)	(0.0276)	(0.0313)	(0.0298)
Married	0.2212***	0.1923***	0.1297***	0.1328***
	(0.0144)	(0.0157)	(0.0197)	(0.0195)
Recent Married	-0.0943*	-0.0831*	-0.0598	-0.0577
	(0.0370)	(0.0325)	(0.0342)	(0.0340)
Recent Divorced	0.4107***	0.3630***	0.2992***	0.3014***
	(0.0605)	(0.0331)	(0.0352)	(0.0349)
Children	0.0395***	0.0436***	0.0389***	0.0520***
	(0.0069)	(0.0069)	(0.0114)	(0.0097)
4-Years College	0.1797***	0.2210***	0.3117***	0.2945***
	(0.0152)	(0.0213)	(0.0457)	(0.0445)
High School	0.1824***	0.1747***	0.0377	0.0317
	(0.0194)	(0.0254)	(0.0532)	(0.0527)
Age	0.0104***	0.0124***	0.0162***	0.0160***
	(0.0019)	(0.0021)	(0.0025)	(0.0025)
Assets	0.0849***	0.0740***	0.0623***	0.0622***
	(0.0039)	(0.0020)	(0.0022)	(0.0022)
Income	-0.2271***	-0.2365***	-0.2506***	-0.2513***
	(0.0104)	(0.0090)	(0.0097)	(0.0096)
Interest Rate	-0.0715***	-0.0742***	-0.0762***	-0.0747***
	(0.0063)	(0.0074)	(0.0088)	(0.0087)
Urban	0.0266	0.0230	0.0353	0.0258
	(0.0145)	(0.0173)	(0.0226)	(0.0219)
Northeast	-0.0934***	-0.1064***	-0.1328*	-0.1424*
	(0.0204)	(0.0286)	(0.0572)	(0.0564)
Northcentral	-0.0382	-0.0482	-0.0536	-0.0481
	(0.0195)	(0.0260)	(0.0489)	(0.0483)
West	0.1338***	0.1022***	-0.0146	-0.0201
	(0.0226)	(0.0281)	(0.0555)	(0.0550)
Born South	-0.0801***	-0.0917***		0.1696**
	(0.0179)	(0.0247)		(0.0652)
Black	-0.2204***	-0.2605***		-1.2573***
	(0.0156)	(0.0222)		(0.1746)
Hispanic	-0.0439	-0.0437		1.5751***
	(0.0229)	(0.0282)		(0.3624)
Female	0.1091***	0.1080***		-0.1846
	(0.0117)	(0.0175)		(0.1768)
Constant	1.1153***	1.1771***	1.3130***	1.4564***
	(0.1698)	(0.1431)	(0.1744)	(0.1953)

*p<0.05, **p<0.01, ***p<0.001

[a] X_1 = (Employed, Weeks Unemp., Health Problem, Children, Urban), Z_1 = (Born South)

Table 4: Results for Non-Collateral Debt to Income Ratio

	OLS	RE	FE	HT[a]
Employed	-0.2736**	-0.2798***	-0.2715***	-0.2669***
	(0.0857)	(0.0291)	(0.0334)	(0.0323)
Weeks Unemp.	0.0031***	0.0027***	0.0021***	0.0021***
	(0.0008)	(0.0006)	(0.0006)	(0.0006)
Health Problem	0.1222***	0.1150***	0.1038***	0.0972***
	(0.0256)	(0.0167)	(0.0192)	(0.0178)
Married	-0.0600***	-0.0687***	-0.0707***	-0.0684***
	(0.0081)	(0.0096)	(0.0121)	(0.0117)
Recent Married	0.0342	0.0374	0.0311	0.0326
	(0.0207)	(0.0196)	(0.0209)	(0.0204)
Recent Divorced	0.0765*	0.0653**	0.0588**	0.0603**
	(0.0347)	(0.0200)	(0.0215)	(0.0210)
Children	0.0178***	0.0142***	-0.0121	-0.0018
	(0.0043)	(0.0042)	(0.0070)	(0.0057)
4-Years College	0.0537***	0.0600***	0.0931***	0.0793**
	(0.0086)	(0.0131)	(0.0279)	(0.0267)
High School	0.0092	-0.0039	-0.0013	-0.0063
	(0.0125)	(0.0155)	(0.0325)	(0.0317)
Age	0.0032***	0.0038***	0.0054***	0.0049***
	(0.0007)	(0.0008)	(0.0009)	(0.0009)
Assets	-0.0022	-0.0012	-0.0001	-0.0002
	(0.0019)	(0.0012)	(0.0013)	(0.0013)
Income	-0.0608***	-0.0595***	-0.0563***	-0.0569***
	(0.0037)	(0.0054)	(0.0059)	(0.0058)
Interest Rate	-0.0587***	-0.0578***	-0.0570***	-0.0572***
	(0.0036)	(0.0026)	(0.0027)	(0.0026)
Urban	-0.0093	-0.0126	-0.0154	-0.0229
	(0.0089)	(0.0105)	(0.0139)	(0.0132)
Northeast	-0.0340**	-0.0294	-0.0234	-0.0306
	(0.0106)	(0.0175)	(0.0351)	(0.0340)
Northcentral	-0.0129	-0.0015	0.0433	0.0471
	(0.0110)	(0.0159)	(0.0300)	(0.0291)
West	0.0099	0.0158	0.0106	0.0061
	(0.0123)	(0.0172)	(0.0340)	(0.0332)
Born South	-0.0162	-0.0142		-0.0983**
	(0.0100)	(0.0152)		(0.0366)
Black	-0.0189	-0.0248		0.3028**
	(0.0097)	(0.0137)		(0.0975)
Hispanic	0.0026	0.0051		-0.3370
	(0.0129)	(0.0173)		(0.2017)
Female	0.0323***	0.0359***		0.2780**
	(0.0069)	(0.0107)		(0.0981)
Constant	0.8242***	0.8229***	0.7722***	0.6536***
	(0.0951)	(0.0525)	(0.0630)	(0.0839)

*p<0.05, **p<0.01, ***p<0.001

[a] X_1 = (Employed, Weeks Unemp., Health Problem, Children, Urban), Z_1 = (Born South)

Table 5: Results for Debt to Asset Ratio

	OLS	RE	FE	HT[a]
Employed	0.0402	0.0055	-0.0781	-0.0713
	(0.0949)	(0.0631)	(0.0704)	(0.0689)
Weeks Unemp.	0.0066***	0.0039**	0.0010	0.0014
	(0.0017)	(0.0013)	(0.0014)	(0.0014)
Health Problem	0.2337***	0.1679***	0.0972*	0.1279**
	(0.0497)	(0.0370)	(0.0412)	(0.0390)
Married	-0.1236***	-0.1132***	-0.0824**	-0.0831***
	(0.0183)	(0.0210)	(0.0251)	(0.0246)
Recent Married	0.0775	0.0568	0.0254	0.0249
	(0.0406)	(0.0410)	(0.0431)	(0.0423)
Recent Divorced	-0.0292	-0.0550	-0.0468	-0.0472
	(0.0538)	(0.0430)	(0.0455)	(0.0446)
Children	0.0499***	0.0468***	0.0302*	0.0272*
	(0.0084)	(0.0098)	(0.0147)	(0.0125)
4-Years College	0.1176***	0.1060***	0.0990	0.0909
	(0.0194)	(0.0308)	(0.0580)	(0.0557)
High School	0.0102	-0.0192	-0.0339	-0.0366
	(0.0294)	(0.0384)	(0.0723)	(0.0707)
Age	-0.0055*	-0.0064*	-0.0077*	-0.0076*
	(0.0026)	(0.0028)	(0.0032)	(0.0032)
Assets	-0.0464***	-0.0358***	-0.0292***	-0.0293***
	(0.0020)	(0.0025)	(0.0027)	(0.0027)
Income	-0.0582***	-0.0416***	-0.0254*	-0.0264*
	(0.0068)	(0.0113)	(0.0121)	(0.0119)
Interest Rate	-0.0365***	-0.0313**	-0.0301**	-0.0312**
	(0.0088)	(0.0099)	(0.0113)	(0.0111)
Urban	0.0345	0.0122	-0.0054	-0.0076
	(0.0176)	(0.0234)	(0.0288)	(0.0277)
Northeast	0.0010	-0.0131	-0.0366	-0.0450
	(0.0332)	(0.0414)	(0.0735)	(0.0717)
Northcentral	0.0311	0.0208	-0.0917	-0.0812
	(0.0292)	(0.0374)	(0.0627)	(0.0613)
West	0.0280	-0.0056	-0.0309	-0.0273
	(0.0304)	(0.0405)	(0.0713)	(0.0699)
Born South	-0.0227	-0.0331		-0.4089***
	(0.0275)	(0.0369)		(0.0886)
Black	-0.0258	-0.0283		1.1054***
	(0.0232)	(0.0343)		(0.2521)
Hispanic	-0.0403	-0.0255		-1.4438**
	(0.0239)	(0.0432)		(0.4740)
Female	0.0921***	0.0934***		0.1461
	(0.0154)	(0.0269)		(0.2584)
Constant	1.1245***	1.1977***	1.3708***	1.3840***
	(0.1855)	(0.1924)	(0.2261)	(0.2560)

*p<0.05, **p<0.01, ***p<0.001

[a] X_1 = (Employed, Weeks Unemp., Health Problem, Children, Urban), Z_1 = (Born South)

Table 6: Results for Non-Collateral Debt to Asset Ratio

	OLS	RE	FE	HT[a]
Employed	0.0187	0.0010	-0.0628	-0.0645
	(0.0952)	(0.0615)	(0.0684)	(0.0675)
Weeks Unemp.	0.0091***	0.0057***	0.0025	0.0024
	(0.0017)	(0.0012)	(0.0014)	(0.0013)
Health Problem	0.2534***	0.1884***	0.1202**	0.1197**
	(0.0489)	(0.0358)	(0.0398)	(0.0393)
Married	-0.2472***	-0.2284***	-0.1877***	-0.1886***
	(0.0174)	(0.0204)	(0.0242)	(0.0239)
Recent Married	0.0989*	0.0784*	0.0458	0.0452
	(0.0399)	(0.0395)	(0.0415)	(0.0411)
Recent Divorced	-0.0764	-0.0885*	-0.0721	-0.0728
	(0.0531)	(0.0416)	(0.0440)	(0.0435)
Children	0.0400***	0.0372***	0.0259	0.0223
	(0.0080)	(0.0096)	(0.0141)	(0.0125)
4-Years College	0.0982***	0.0661*	0.0025	0.0171
	(0.0192)	(0.0300)	(0.0559)	(0.0403)
High School	-0.0352	-0.0632	-0.0678	-0.0620
	(0.0277)	(0.0374)	(0.0697)	(0.0675)
Age	-0.0031	-0.0048**	-0.0060**	-0.0059**
	(0.0016)	(0.0016)	(0.0019)	(0.0018)
Assets	-0.0387***	-0.0283***	-0.0219***	-0.0219***
	(0.0021)	(0.0025)	(0.0027)	(0.0026)
Income	-0.0683***	-0.0493***	-0.0328**	-0.0324**
	(0.0066)	(0.0109)	(0.0116)	(0.0115)
Interest Rate	-0.0560***	-0.0534***	-0.0517***	-0.0517***
	(0.0061)	(0.0052)	(0.0054)	(0.0054)
Urban	0.0294	0.0031	-0.0222	-0.0183
	(0.0168)	(0.0227)	(0.0278)	(0.0269)
Northeast	0.0782*	0.0720	0.0523	0.0560
	(0.0321)	(0.0403)	(0.0711)	(0.0700)
Northcentral	0.0430	0.0363	-0.0663	-0.0686
	(0.0277)	(0.0364)	(0.0607)	(0.0599)
West	0.0467	0.0248	0.0251	0.0266
	(0.0292)	(0.0394)	(0.0690)	(0.0682)
Born South	-0.0196	-0.0289		-0.5011***
	(0.0263)	(0.0360)		(0.0862)
Black	-0.0043	0.0033		1.5203***
	(0.0224)	(0.0335)		(0.2430)
Hispanic	-0.0382	-0.0281		-1.9502***
	(0.0232)	(0.0422)		(0.4086)
Female	0.0455**	0.0465		-0.2848
	(0.0150)	(0.0263)		(0.2831)
Constant	0.9814***	1.0888***	1.2092***	1.4199***
	(0.1268)	(0.1117)	(0.1300)	(0.1986)

*p<0.05, **p<0.01, ***p<0.001

[a] X_1 = (Employed, Weeks Unemp., Children, 4-Year College, Urban), Z_1 = (Born South)

Table 7: Results for Total Debt Level

	OLS	RE	FE	HT[a]
Employed	0.1632***	0.1567***	0.1264***	0.1244***
	(0.0297)	(0.0179)	(0.0201)	(0.0191)
Weeks Unemp.	-0.0028***	-0.0019***	-0.0005	-0.0005
	(0.0003)	(0.0004)	(0.0004)	(0.0004)
Health Problem	-0.0362**	-0.0314**	-0.0036	-0.0036
	(0.0124)	(0.0112)	(0.0125)	(0.0119)
Married	0.3175***	0.3189***	0.3048***	0.3041***
	(0.0061)	(0.0064)	(0.0080)	(0.0076)
Recent Married	-0.1388***	-0.1367***	-0.1177***	-0.1182***
	(0.0160)	(0.0134)	(0.0138)	(0.0132)
Recent Divorced	0.1072***	0.0979***	0.0820***	0.0815***
	(0.0164)	(0.0136)	(0.0142)	(0.0135)
Children	0.0115***	0.0160***	0.0475***	0.0449***
	(0.0025)	(0.0028)	(0.0046)	(0.0043)
4-Years College	0.2158***	0.2456***	0.2322***	0.2360***
	(0.0079)	(0.0085)	(0.0185)	(0.0176)
High School	0.1015***	0.0898***	-0.0929***	-0.0921***
	(0.0055)	(0.0101)	(0.0213)	(0.0202)
Age	0.0047***	0.0054***	0.0068***	0.0068***
	(0.0008)	(0.0008)	(0.0010)	(0.0010)
Assets	0.0837***	0.0756***	0.0652***	0.0653***
	(0.0023)	(0.0008)	(0.0009)	(0.0008)
Income	0.1305***	0.1029***	0.0637***	0.0639***
	(0.0087)	(0.0037)	(0.0039)	(0.0037)
Interest Rate	-0.0336***	-0.0383***	-0.0408***	-0.0411***
	(0.0026)	(0.0030)	(0.0035)	(0.0034)
Urban	0.0509***	0.0276***	-0.0220*	-0.0197*
	(0.0060)	(0.0070)	(0.0091)	(0.0087)
Northeast	-0.0170	-0.0161	-0.0664**	-0.0638**
	(0.0092)	(0.0114)	(0.0231)	(0.0220)
Northcentral	-0.0244**	-0.0242*	-0.0045	-0.0063
	(0.0082)	(0.0104)	(0.0197)	(0.0187)
West	0.0983***	0.0916***	0.0620**	0.0631**
	(0.0099)	(0.0112)	(0.0224)	(0.0214)
Born South	-0.0567***	-0.0614***		0.1766**
	(0.0075)	(0.0098)		(0.0635)
Black	-0.0699***	-0.0845***		-0.9336***
	(0.0061)	(0.0088)		(0.1713)
Hispanic	-0.0258**	-0.0293**		1.7939***
	(0.0087)	(0.0111)		(0.3877)
Female	0.0157**	0.0117		-0.6622***
	(0.0050)	(0.0069)		(0.1927)
Constant	-0.0271	0.0484	0.2312***	0.5148***
	(0.0574)	(0.0577)	(0.0700)	(0.1134)

*p<0.05, **p<0.01, ***p<0.001

[a] X_1 = (Employed, Weeks Unemp., Health Problem, Children, Urban), Z_1 = (Born South)

Table 8: Results for Non-Collateral Debt Level

	OLS	RE	FE	HT[a]
Employed	0.0013	0.0013	-0.0192	-0.0160
	(0.0238)	(0.0106)	(0.0128)	(0.0124)
Weeks Unemp.	0.0001	0.0001	0.0000	0.0001
	(0.0002)	(0.0002)	(0.0003)	(0.0002)
Health Problem	0.0187*	0.0187**	0.0141	0.0143
	(0.0086)	(0.0063)	(0.0079)	(0.0078)
Married	0.0083**	0.0083*	-0.0013	-0.0001
	(0.0032)	(0.0033)	(0.0050)	(0.0049)
Children	0.0044**	0.0044***	-0.0016	0.0030
	(0.0015)	(0.0013)	(0.0029)	(0.0021)
Recent Married	0.0038	0.0038	0.0077	0.0084
	(0.0082)	(0.0080)	(0.0087)	(0.0086)
Recent Divorced	0.0179	0.0179*	0.0083	0.0091
	(0.0112)	(0.0081)	(0.0090)	(0.0088)
4-Years College	0.0179***	0.0179***	0.0492***	0.0359***
	(0.0041)	(0.0038)	(0.0117)	(0.0061)
High School	0.0116***	0.0116*	-0.0406**	-0.0450***
	(0.0033)	(0.0047)	(0.0134)	(0.0128)
Age	0.0012***	0.0012***	0.0018***	0.0016***
	(0.0003)	(0.0003)	(0.0004)	(0.0004)
Assets	0.0049***	0.0049***	0.0060***	0.0059***
	(0.0012)	(0.0005)	(0.0006)	(0.0005)
Income	0.0010	0.0010	-0.0018	-0.0022
	(0.0030)	(0.0021)	(0.0025)	(0.0024)
Interest Rate	-0.0262***	-0.0262***	-0.0262***	-0.0263***
	(0.0015)	(0.0011)	(0.0011)	(0.0011)
Urban	0.0012	0.0012	-0.0024	-0.0066
	(0.0035)	(0.0036)	(0.0058)	(0.0055)
Northeast	-0.0160***	-0.0160**	0.0051	0.0009
	(0.0047)	(0.0052)	(0.0146)	(0.0143)
Northcentral	-0.0051	-0.0051	0.0137	0.0163
	(0.0048)	(0.0048)	(0.0125)	(0.0122)
West	0.0042	0.0042	0.0138	0.0119
	(0.0056)	(0.0051)	(0.0142)	(0.0140)
Born South	-0.0049	-0.0049		0.0240*
	(0.0044)	(0.0043)		(0.0116)
Black	-0.0017	-0.0017		-0.0633*
	(0.0038)	(0.0038)		(0.0273)
Hispanic	0.0024	0.0024		0.1723**
	(0.0051)	(0.0046)		(0.0533)
Female	0.0053	0.0053		-0.0433
	(0.0029)	(0.0029)		(0.0318)
Constant	0.2050***	0.2050***	0.2535***	0.2682***
	(0.0273)	(0.0195)	(0.0257)	(0.0325)

*p<0.05, **p<0.01, ***p<0.001

[a] X_1 = (Employed, Weeks Unemp., Children, 4-Year College, Urban), Z_1 = (Born South)