



# Household debt, economic conditions, and income inequality: A state level analysis



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## ABSTRACT

This paper uses OLS regressions to understand the relationship between household debt, income inequality, and economic growth in the United States. For robustness we use two different measures of income inequality. The results show that, for the period 2003–2012, there is statistical evidence that increases in household debt are associated with lower levels of economic growth and higher rates of unemployment. In addition, we uncover evidence that high growth rates in household debt are associated with negative growth in income inequality, likely because debt caused economic growth to slow, diminishing the returns of top earners.

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## 1. Introduction

U.S. household debt relative to income has increased significantly, with a particularly large rise in the period prior to the Great Recession. Fig. 1 suggests that, on average, U.S. household debt relative to Gross Domestic Product (GDP), across all 50 states, increased by almost 50% during the period between 2003 and 2008. The increase primarily represents households' attempts to smooth consumption over time on the expectation of increases in future income (Dyan and Kohn, 2007). A combination of several other factors, such as, low interest rates, changes in the regulatory environment for financial institutions, and technological advancement in credit risk control are also

suggested to have played an important role in household indebtedness (Iacoviello, 2008). However, the increase in the aggregate ratio of household debt observed from the data was mainly concentrated among the households outside the top of the income distribution (Cynamon and Fazzari, 2013; Barba and Pivetti, 2008; Debelles, 2004).

As a result, many economists have provided qualitative and quantitative arguments showing that increases in debt are the counterpart of the redistribution of income in the U.S. Kumhof and Ranciere (2013) provide a rigorous theoretical framework linking income inequality and household debt-to-income ratios. The key mechanism is that increases in the size and importance of the financial sector to the U.S. economy over the years has made it easier for high income households to back their financial investments with loans to the rest of the population. As such, lower income households were able to sustain their consumption levels; whereas, high income households gained

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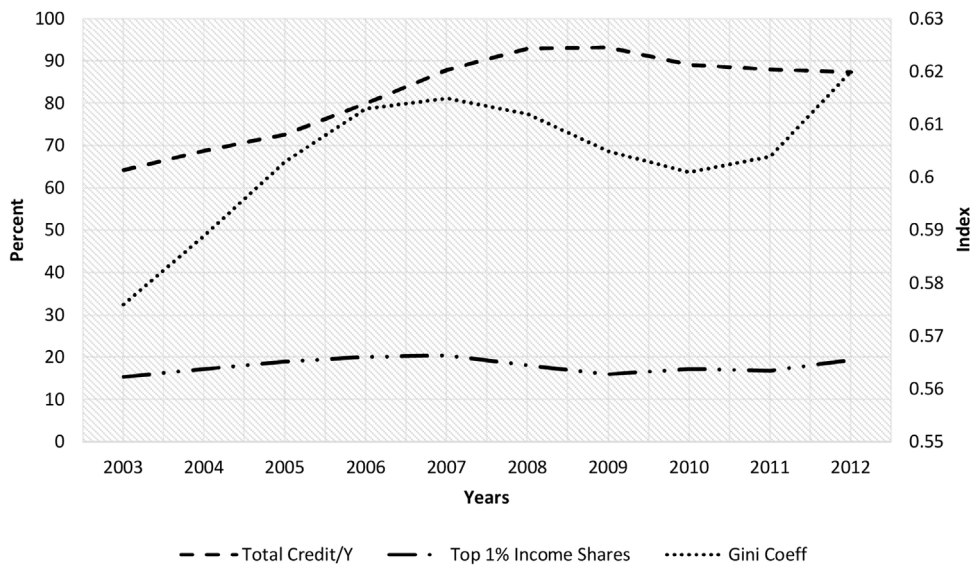


Fig. 1. Time series' calculated as averages across U.S. states.

additional income, further exacerbating income inequality. Similarly, Barba and Pivetti (2008) claim that, over the past 25 years, “keeping up with the Joneses” contributed to household indebtedness as families financed consumption at levels in excess of current income. The dissaving was mainly concentrated among the households in the lower 90% of the income distribution, which has been compensated with savings by the upper 10% of the distribution. Thus, top earners “allowed” those at the low and middle levels of the income distribution to minimize the drop in their consumption through increased debt.

In this paper, we show that the basic prediction of debt leading to increases in income inequality is soundly rejected in the data for the U.S. states from 2003 to 2012. Growth in household debt over a one-year period predicts subsequently lower growth rates in income inequality. The identified association remains significant even after including other explanatory variables and controlling for the Great Recession period.<sup>1</sup> In addition, splitting the sample into the pre-2008 and post-2009 periods did not change the significance of our findings. The empirical findings suggest that the dramatic indebtedness of households can be harmful not only for the overall state of the economy (Mian, Sufi, and Verner, 2015), but for the income shares of top earners as well.

Given this background, there are several channels through which we believe increases in debt can negatively impact top income groups. However, we do not attempt to test the channels specifically. First, as noted above and documented in our findings, increases in debt predict lower economic growth, which suggest lower liquidity and earnings in stock markets (Levine and Zervos, 1998). Second, periods of low economic growth correspond with low interest rates, leading to low returns on savings. Lastly, periods of high debt-to-income are typically followed by

high default and deleveraging rates, further exacerbating downward returns on investments (Mian and Sufi, 2011).

The remainder of the paper is structured as follows. The next section presents the data and summary statistics. Section 3 presents the empirical results and Section 4 concludes.

## 2. Data and summary statistics

We build a state level panel data set that includes information on household debt, income inequality, unemployment, and GDP. The U.S. states in the sample and the years covered by the two key variables, household debt and income inequality, are summarized in Table 1. The data are annual and span from 2003 to 2012, providing over 500 state/year observations before taking differences. We believe that disaggregating data at the state level provides us with an adequate number of observations to understand the relationship between household debt and income inequality. Also, it allows us to take into account the heterogeneity in debt and income inequality that might exist across U.S. states at each period of time rather than just using broad aggregate measures which may miss important details.

The key variable measuring expansion in household debt is the change in household debt-to-GDP. We denote the change in household debt-to-GDP from year  $t-h$  to year  $t$  by  $\Delta_h(HHD/Y)_t$ . Household debt is defined as the sum of the outstanding balance of automobile loan debt, credit card debt, mortgage debt, and student loan debt at the end of year  $t$ . The data source for household debt is the “Consumer Credit Panel/Equifax” from the Federal Reserve Bank of New York (FRBY), April, 2015. The databank provides yearly information on consumer debt starting from 2003. The annual measures of income inequality are from Frank, Sommeiller, Price, and Saez (2015). The income data they used for constructing the income inequality measures are

<sup>1</sup> Years 2008 and 2009.

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