Greater inequality and household borrowing? New evidence from household data

Olivier Coibion, Yuriy Gorodnichenko, Marianna Kudlyak, John Mondragon 29 January 2014

One popular explanation for the increase in US household debt in the years before the subprime mortgage crisis is that households with stagnating incomes borrowed more to 'keep up with the Joneses'. This column presents recent research that questions this explanation. Low-income households in high-inequality regions in fact borrowed relatively little compared to similar households in low-inequality regions. A theoretical model in which greater local income inequality facilitates the screening of loan applicants makes predictions that are consistent with the data.

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The financial crisis of 2008–09 was preceded by an exceptional rise in borrowing by US households, accounted for primarily by a rise in mortgage debt. There are two main views about the source of this 'great leveraging':

- The rise in borrowing reflected 'credit supply' factors.

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Proponents point to progress in information technology (Sanchez 2009) and rising financialisation of debt (especially mortgages) as increasing the supply of credit, particularly to low-income and high-risk households (Drozd and Serrano-Padial 2013).

- The rise was driven by political motivations for expanding credit supply.

For example, Rajan (2010) argues that, in response to rising income inequality, credit was made increasingly available to lower-income groups to support their consumption levels in the face of stagnant incomes.

According to the second view ('demand for credit'), there was a rise in the demand for borrowing on the part of US households, especially low-income households. One possible motivation for rising demand for borrowing again stems from rising income inequality. Specifically, higher consumption on the part of wealthy households could have increased the demand for borrowing by lower-income households in their attempts to 'keep up' with their wealthier neighbours. Indeed, there is a positive correlation between income inequality in the US and household debt relative to GDP as illustrated in Figure 1 below. The correlation is certainly consistent with the possibility of a causal relationship running from inequality to household borrowing.

New evidence on inequality and debt

In a recent working paper (Coibion et al. 2014), we examine the link between inequality and household borrowing. In particular, we investigate whether borrowing patterns on the part of low-, middle- and high-income households differed depending on the level of local income inequality. To measure both debt and inequality, we use unique data from the New York Federal Reserve Bank Consumer Credit Panel/Equifax which provides comprehensive debt measures for millions of US households since 1999, including detailed decompositions of debt by type. Because this dataset does not include household income, we use the relationship between household debt and income, conditional on observable household characteristics, in the Survey of Consumer Finances to predict initial household income in 2001. From these imputed levels of income, we construct measures of local inequality (which are highly correlated with alternative measures of local inequality constructed from either Census or IRS income data) at the ZIP code, county, and state levels, as well as measures of household debt-to-income ratios.

Figure 1. Inequality and debt in the US

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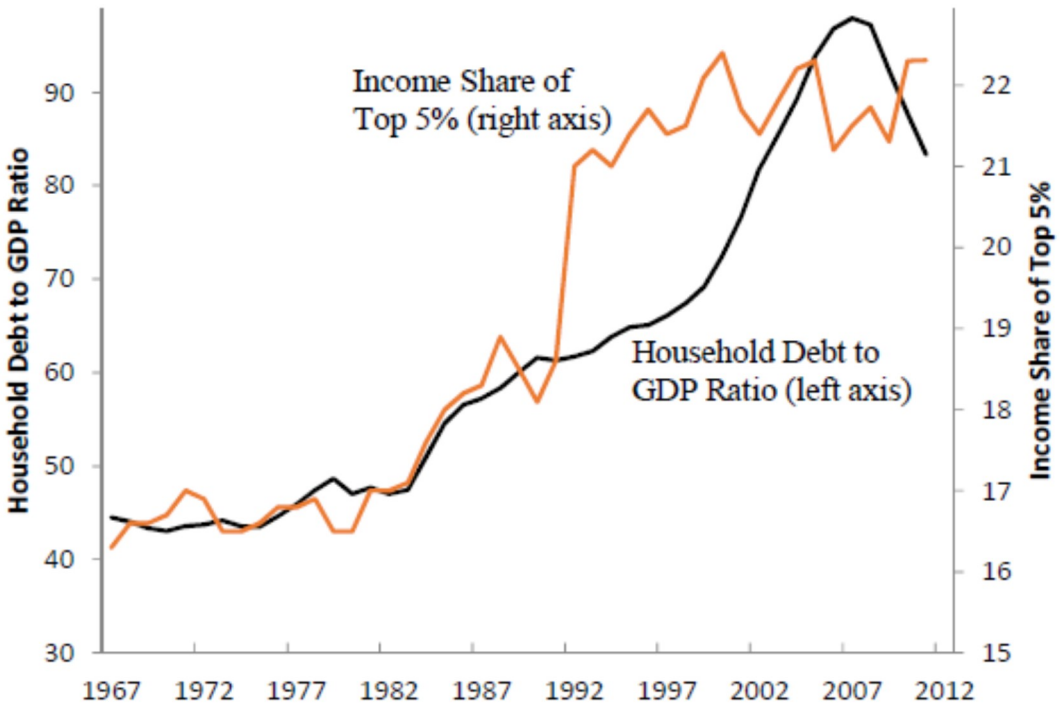

Source: Coibion et al. (2014). The figure plots the income share of the top 5% of US households (source: IRS) and the ratio of household (and non-profit) total liabilities to GDP (source: Federal Reserve).

Figure 2 below plots county-level inequality across the US from 2001. Inequality is on average highest in the southern states, as well as California and the Pacific Northwest. Midwestern states, in contrast, stand out for having some of the lowest levels of inequality on average. The map also shows that inequality tends to be higher in large cities than in more rural areas. There is even greater regional heterogeneity in inequality at the ZIP code level – the standard deviation of inequality at the ZIP code level is twice as high as at the state or county level.

To assess how borrowing patterns differed with local inequality levels, we characterise the evolution of household debt levels, relative to initial income levels, across income groups in areas with different levels of income inequality. Our main finding is that low-income households in high-inequality regions borrowed relatively less than similar households in low-inequality regions. We illustrate this in Figure 3 below, which plots non-parametric estimates of the evolution of household debt-to-income ratios across the 2000s for 'low-income' and 'high-income' households living in low-

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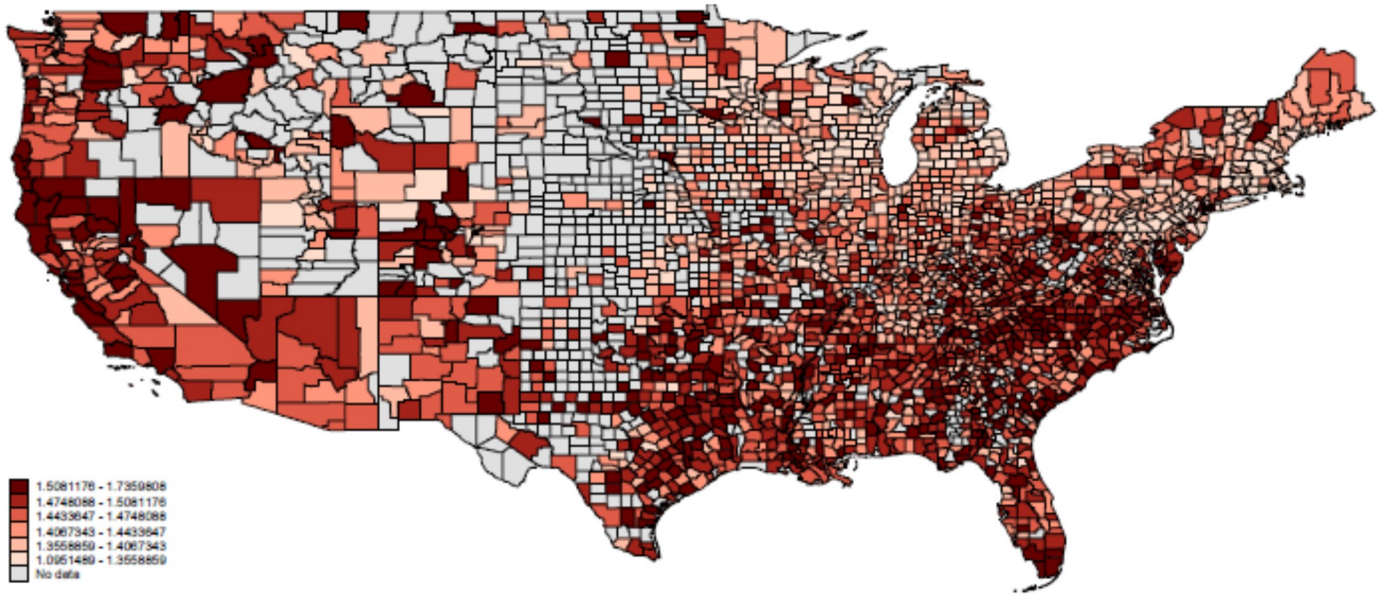
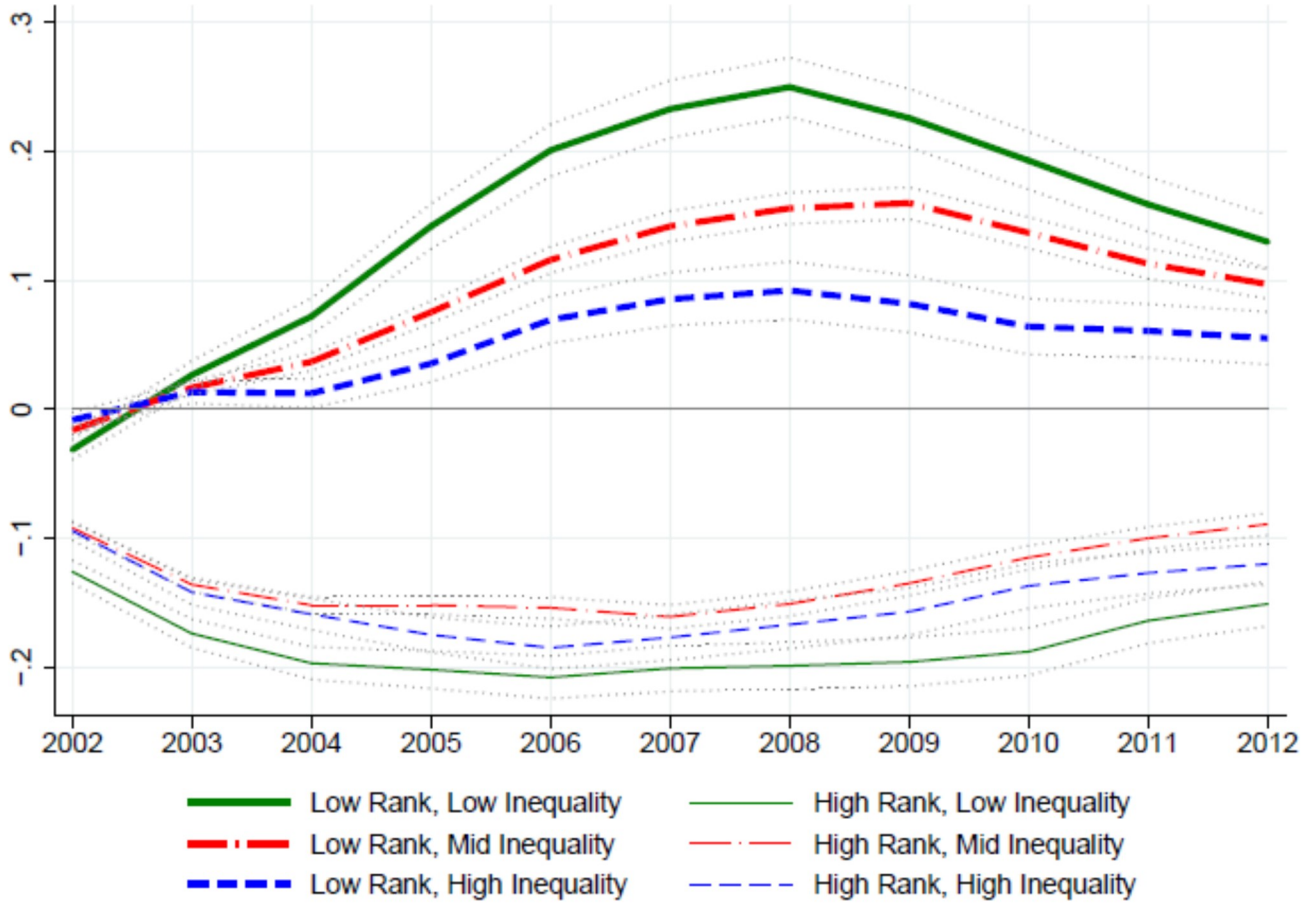
inequality, medium-inequality, or high-inequality ZIP codes relative to those of 'medium-income' households. While the differences across inequality regions for high-ranked households are small, low-ranked households display much larger differences in debt accumulation patterns across low- and high-inequality regions, reaching around 15% of initial income levels by 2008. These differences are precisely the opposite of what one would have expected if 'keeping up with the Joneses' drove the rise in household debt during the 2000s. As we document in the text, these results survive an extensive array of robustness checks.

Figure 2. Inequality across US counties



Source: Coibion et al. (2014). The figure plots inequality in 2001 at the county level. Darker counties are more unequal, with each bin representing a quintile of the distribution across counties.

Figure 3. Debt accumulation across households and local inequality



Source: Coibion et al. (2014). The figure shows non-parametric estimates of the evolution of debt to initial income ratios for households in different income groups living in regions with different levels of inequality. The dotted lines show the 95%-confidence interval.

Because our data provides disaggregated information on household debt, we assess the link between local inequality and different forms of debt: mortgage debt, auto debt, and credit-card debt. We find strong evidence that low-income households in high-inequality regions borrowed less in terms of both mortgage and auto debt than those in low-inequality regions. A unique feature of the data is that we have information on both credit-card balances and credit-card limits. This is particularly useful because the latter can be interpreted as largely representing credit supply, whereas the former primarily reflects the demand for credit. We find that low-income households in

high-inequality regions saw their credit limits rise by less than those in lower-inequality regions – as was the case with mortgage and auto debt. At the same time, no economically significant difference is observed in terms of credit card balances. This contrast points to supply-side factors as being at the root of the differential debt accumulation patterns in the data.

Income inequality and credit rationing

We present a model that provides one potential supply-side explanation for why differential borrowing behaviours could be related to regional inequality. Each region is composed of two types of households, such that 'high-type' households have higher income on average than 'low-type' households, and are also less likely to (exogenously) default on debt. Banks in each region lend to these households, but do not observe households' types – only their income and another signal correlated with the underlying type. The key mechanism in the model is that as local income inequality rises, banks treat an applicant's income as an increasingly precise signal about their type, and therefore target lending toward higher-income households on average. We show how the latter can be accomplished via differential rejection rates (in monopoly banking settings) or differential interest rates (in competitive banking settings). In both cases, banks will make credit more readily accessible (or cheaper) to high-income households when local inequality is higher, because the latter implies that income is a more precise signal of applicant types.

We test these additional theoretical predictions using detailed mortgage application information from the publicly available Home Mortgage Disclosure Act data. These data track mortgage applications as they go through the origination process, and contain information on applicants – including their income, the amount of the loan requested, their locale, and whether the loan is denied or originated. We document that high-income households in high-inequality regions were both less likely to be denied and less likely to be charged higher interest rates than their counterparts in low-inequality regions, precisely as suggested by the theory. Thus, both theoretical predictions from the model are confirmed in the data.

Conclusions

In summary, we document a systematic relationship between local inequality and differential borrowing patterns across richer and poorer households in the US that contradicts predictions based on 'keeping up with the Joneses' motives. We argue that these results can instead be

explained through an information channel. Applicants' incomes are a stronger signal of their underlying quality when local inequality is high, so banks are likely to channel relatively more credit to low-income applicants when the level of local inequality is low. The absence of 'keeping up with Joneses' effects supports the notion that the growth in household borrowing during the mid-2000s was driven in large part by credit supply expansions targeted at lower-income households.

However, to the extent that this expansion in the supply of credit to lower-income households is unlikely to continue (for example if it reflected a one-time securitisation of household debt), our results suggest that a continuation of recent trends toward rising inequality is likely to reduce access to credit for lower-income households. Because limited access to credit restricts households' ability to smooth their consumption and engage in long-term investments (e.g. sending children to college, retraining for different careers) that likely have positive societal externalities, such differential access to credit could ultimately have negative long-term consequences and important policy implications.

Disclaimer: The views expressed here are those of the authors and do not reflect those of the Federal Reserve Bank of Richmond or the Federal Reserve System or any other institution with which the authors are affiliated.

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