



The microdynamics of household credit use through a boom–bust cycle[☆]

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ABSTRACT

In this paper we provide what we believe to be the first evidence on the nature of gross debt flows across consumers. We find that the aggregate dynamics in the consumer debt market are largely explained by the behavior of consumers with mortgage debt, and the behavior of such consumers is found to be sensitive to changes in housing market conditions. Our results show that there is a significant amount of consumer-level heterogeneity as evidenced by large amounts of simultaneous debt creation and debt destruction throughout the economic cycle. Finally, we find that there are important asymmetries in the debt adjustment process: whereas consumers are able to take on large amounts of additional debt quickly, short of defaulting debt is discharged very slowly. This slow deleveraging process may help explain why total consumer debt levels have been so slow to recover in the years following the Great Recession.

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1. Introduction

In the years leading up to the 2008 financial crisis, housing prices exhibited remarkable appreciation, and the amount of debt held by U.S. households expanded at a record pace. Unsurprisingly, much of this debt growth was concentrated in mortgage products. Mian and Sufi (2011) report that after remaining quite stable between 1998 and 2002, the total household debt of homeowners skyrocketed between 2002 and 2006, growing by 34%.

Starting in 2007, homeowners throughout the U.S. were exposed to significant adverse balance sheet shocks when housing values began to fall. A number of authors (e.g., Koo, 2011; Hall, 2011; Eggertsson and Krugman, 2012; Mian and Sufi, 2012; Mian et al., 2013) have conjectured that the sharp reduction in home equity and resulting debt overhang following the collapse of the real estate market led to a pullback in aggregate demand that triggered the Great Recession. The crux of such arguments is that the *distribution* of debt can have important implications for the real economy. Although several post-crisis empirical analyses of the household balance sheet have been conducted, the manner in which the distribution of debt changes over time is still not well understood. A deeper understanding of the dynamics of the distribution of debt requires an analysis of gross credit flows at the consumer level. That said, this paper provides two contributions to the consumer credit literature. First, we provide what we believe to be the first analysis of the nature of consumer debt creation and destruction. This analysis is conducted using the methodology pioneered by Davis and Haltiwanger (1992)

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to study the dynamics of the labor market. Much like the findings in the job dynamics literature, our analysis suggests that gross credit flows are far larger than net credit flows, a result consistent with high levels of heterogeneity in the retail credit market. When decomposing these gross flows, we find a significant amount of lumpiness in the debt adjustment process: most debt creation and destruction is generated by relatively few consumers with large and persistent changes in debt levels. Due to the sheer volume of mortgage debt, such changes are driven primarily by the behavior of consumers that hold mortgages. We also find that the overall debt contraction during the Great Recession was caused by both very sharp reductions in debt creation and increases in debt destruction rates. The increase in debt destruction during this time period was attributable primarily to debt discharged through payment default, as voluntary paydowns had only a limited impact on aggregate indebtedness. For non-defaulting consumers, the deleveraging process has been a lengthy one. This slow adjustment has resulted in a persistently high concentration of debt in previously overheated housing markets, even as home values have begun to recover.

Our second contribution to the literature is a descriptive analysis of the determinants of borrower-level heterogeneity. To develop an understanding of how consumer borrowing behavior responds to changes in housing values, we estimate descriptive regression models similar to those employed in Mian and Sufi (2011), controlling for both concurrent house price changes and changes in housing prices since the mortgage debt was originated. The regression analysis confirms strong and economically significant links between the dynamics in the housing market and the level of consumer indebtedness. Consistent with the aforementioned heterogeneity and lumpiness in the debt reallocation process, however, much of the variation in consumer debt dynamics remain unexplained.

The remainder of the paper is organized as follows. In Section 2 we summarize the recent literature on household credit use. In Section 3 we describe the microdata that we use to analyze flows using the methodology described in Section 4. Section 5 presents basic facts about the process of debt reallocation across consumers, and Sections 6 and 7 investigate possible explanations for simultaneous debt creation and destruction. Section 8 concludes.

2. Literature review

Several authors have studied the relationship between the *net* indebtedness of U.S. households, the housing market, and macroeconomic performance. As much of this work is not germane to our analysis, we review only the most recent such studies. Using credit bureau data, Mian and Sufi (2011) document an incredible rise in household leverage between 2002 and 2006, noting that debt for existing homeowners rose by 34% over this period. In a set of empirical models, the authors regress changes in total debt on a number of controls and the change in a zip code-level house price index, using an instrumental variables strategy to address possible omitted variables bias. The estimated housing price-total debt elasticity from this model was 0.52, suggesting that net credit flows are

quite sensitive to changes in housing prices. This finding leads the authors to conclude that housing price appreciation between 2002 and 2006 resulted in a net change in household indebtedness of roughly \$1.25 trillion, or 53% of the total change in consumer debt over this four year period.

In related work, Mian et al. (2013) study the relationship between the magnitude of housing price declines and consumption using credit bureau and retail sales data. The authors show that households in counties with the highest debt-to-income ratios saw the most significant declines in housing values, leaving many households with negative equity. Additional empirical results provide evidence that the combination of severe house price declines and high debt levels resulted in a significant reduction in the consumption of durable and non-durable goods alike. This result is consistent with the theoretical “liquidity trap” models in Eggertsson and Krugman (2012) and Guerrieri and Lorenzoni (2011) in which forced rapid deleveraging for some households results in a decline in aggregate demand.

Mian and Sufi (2011) and Mian et al. (2013) provide important insights on consumer credit use as it relates to housing markets and the broader economy: during the recent housing cycle many existing homeowners responded to increases in home equity by taking on more debt, and during the downturn the pullback in consumption was particularly severe in highly-leveraged counties that were subjected to sharp house price declines. Significant contributions notwithstanding, these studies do not provide a complete picture of household credit use because, like previous work, they do not analyze *gross* credit flows underlying the significant changes in *net* household indebtedness. There is reason to believe that gross credit flows may reveal important information about how firms and consumers respond to changes in the economic environment, particularly in times of severe economic distress. Banks and borrowers are highly heterogeneous, and theoretical models of financial intermediation suggest that such heterogeneity, when coupled with the informational asymmetries that characterize lending, can result in asymmetric responses to economic shocks. Dell’Ariccia and Garibaldi (2005) [p. 666], note that “credit expansion and credit contraction involve inherently different activities. ... On the one hand, the extension of new loans is likely to be a time-consuming process, especially in markets where asymmetric information is pervasive, screening is costly and time-consuming, and good investment opportunities may be difficult to find. On the other hand, the cost and time associated with credit contractions depend on the liquidity of borrowers and on whether lengthy legal procedures must be pursued.” For consumers, this asymmetry is likely reversed: whereas a consumer can oftentimes take on large amounts of debt quickly, short of declaring bankruptcy, this debt is generally discharged slowly through gradual paydowns.

The existing literature is silent on whether such an asymmetry characterizes retail credit markets, and it provides no evidence on the extent of heterogeneity in consumer borrowing behavior. The literature on *gross* credit flows is far more sparse than the literature addressing

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