Household Leverage and the Recession of 2007 to 2009

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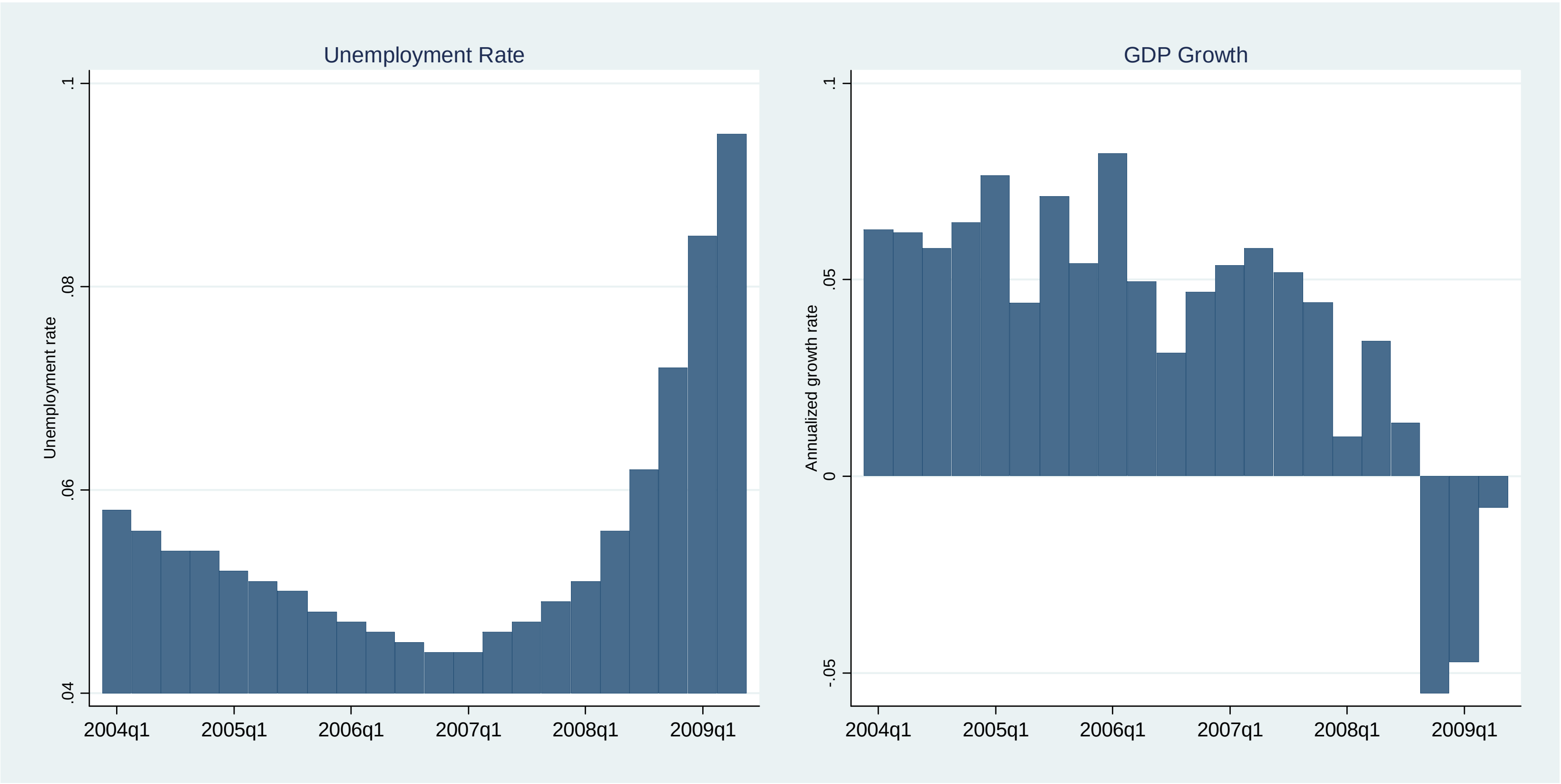
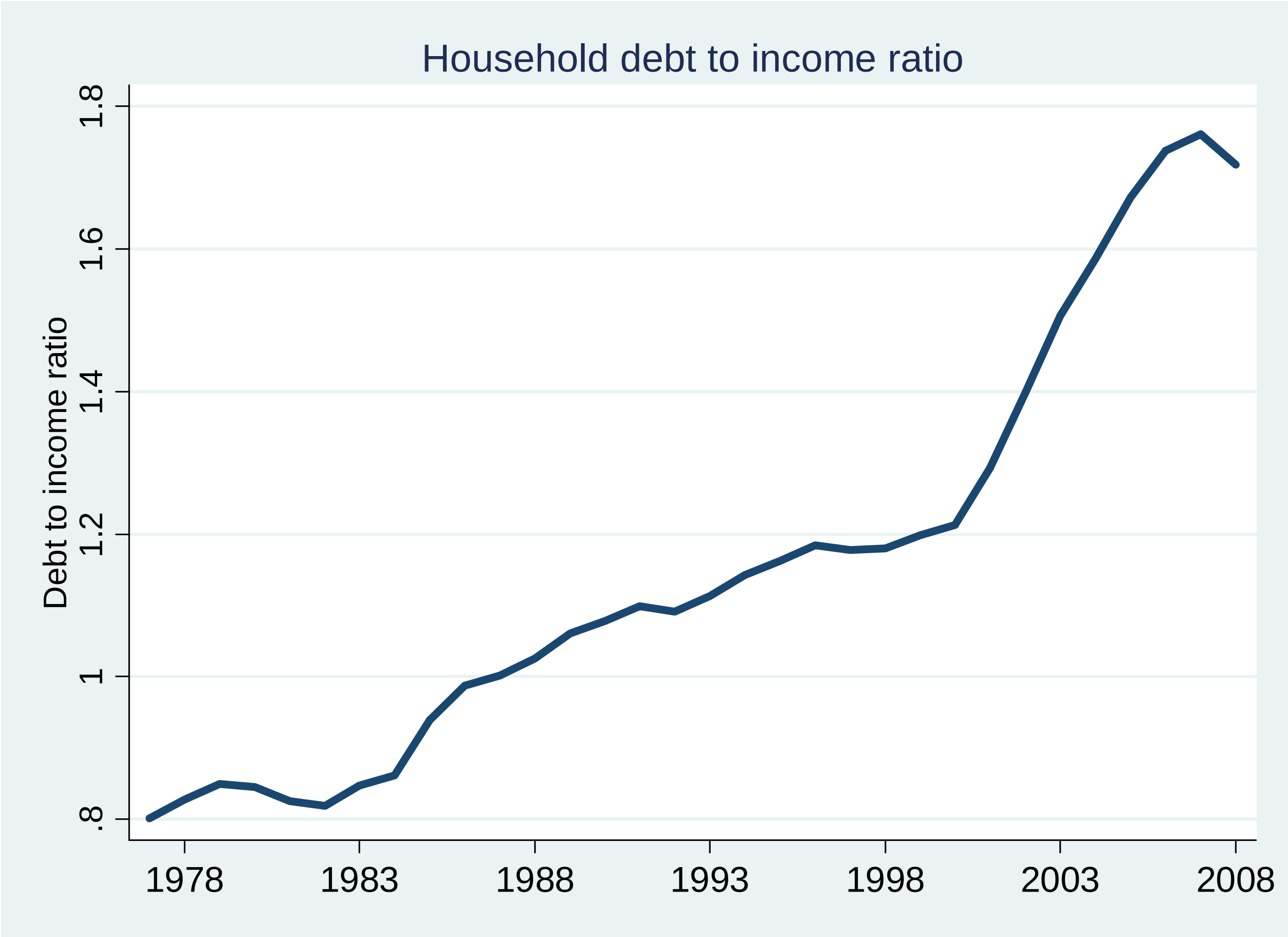
Motivation: Severe Recession of 2007 to 2009



Motivation

- Big picture question: What explains macroeconomic fluctuations?
  - Long-standing question in macroeconomics
  - Our focus: household leverage and the 2007 to 2009 recession

Motivation: Household Leverage



Motivation

- Big picture question: What explains macroeconomic fluctuations?

  - Long-standing question in macroeconomics
  - Our focus: household leverage and the 2007 to 2009 recession

- We …

  - examine cross-sectional variation across U.S. counties in severity of downturn
  - find that variation in household leverage *before* the recession can explain the default, house price, auto sales, unemployment, and residential investment patterns
  - conclude that any sensible theory of what caused the current recession must be consistent with the cross-sectional predictive power of household leverage

Background: Our Previous Papers

- Why did household leverage increase to such historically high levels from 2002 to 2006?

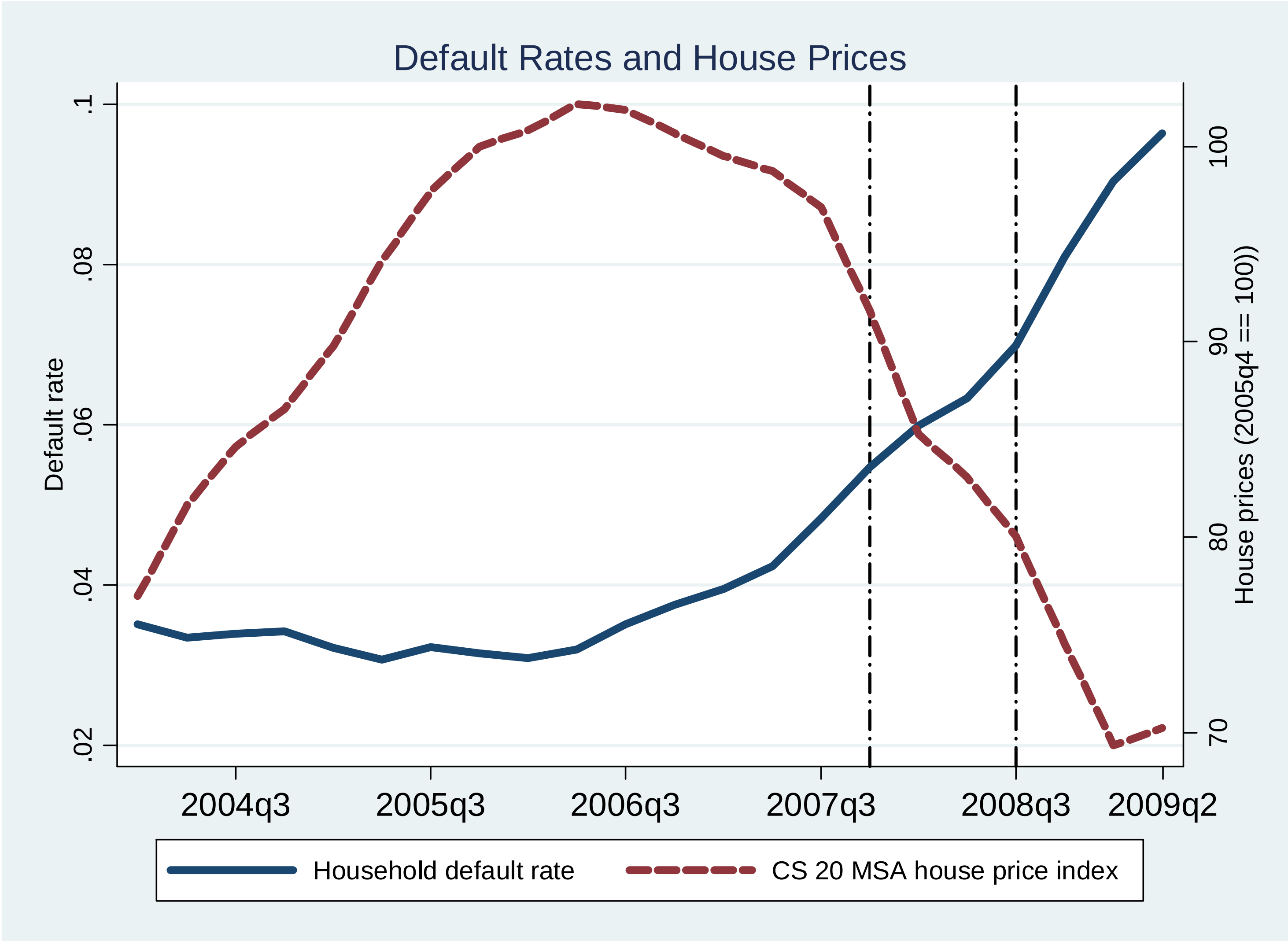
- Mian and Sufi (QJE, 2009a): Credit supply is key

  - Financial innovation (subprime mortgage securitization) leads to sharp increase in credit to low income/credit score individuals
  - Increased credit availability pushes up house prices, but only in areas with <u>inelastic housing supply</u>
  - Evidence *contradicts* standard productivity story for house prices and household leverage

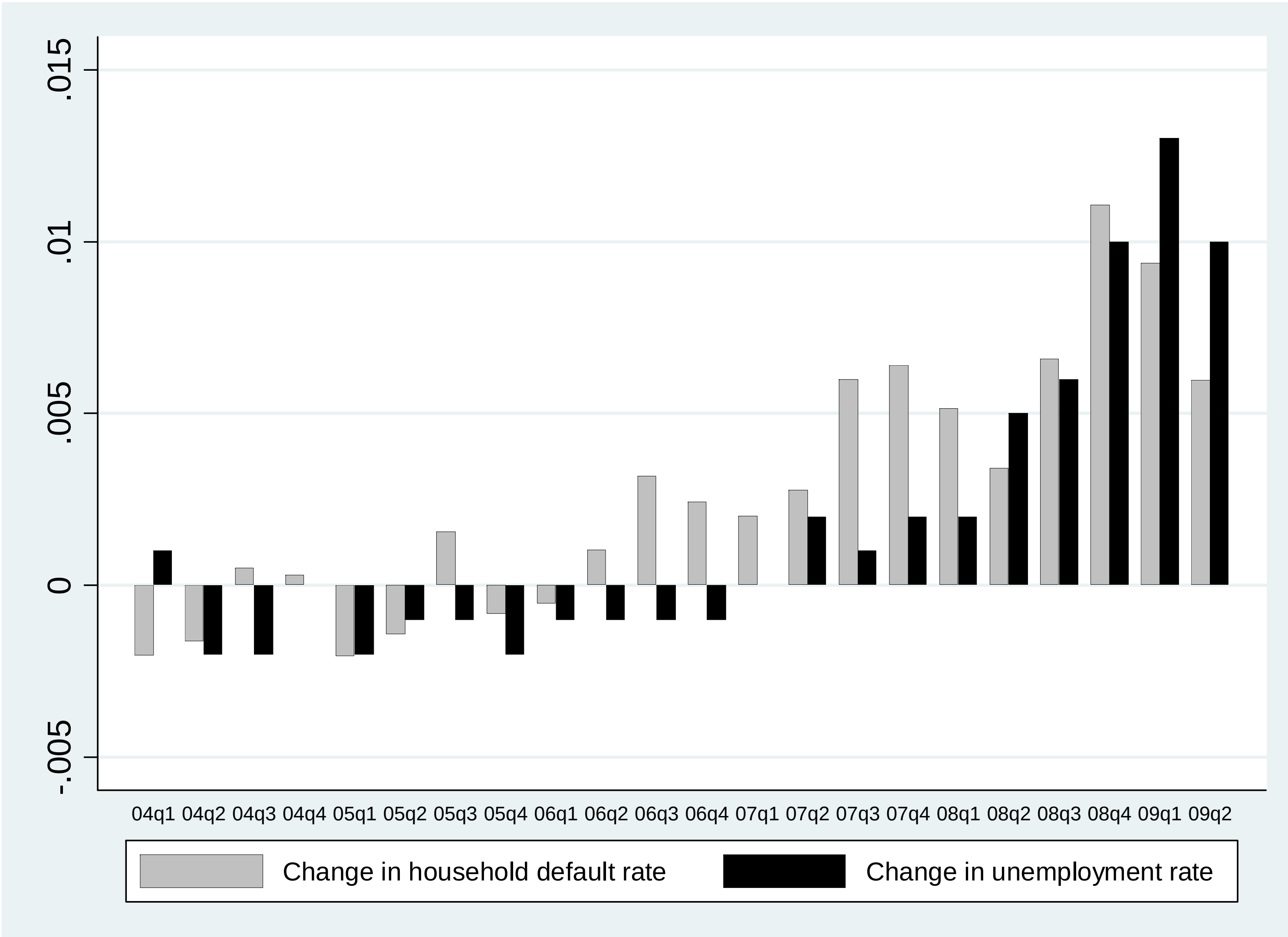
- Mian and Sufi (WP, 2009b)

  - Existing homeowners respond to higher house prices by aggressively borrowing against home equity.

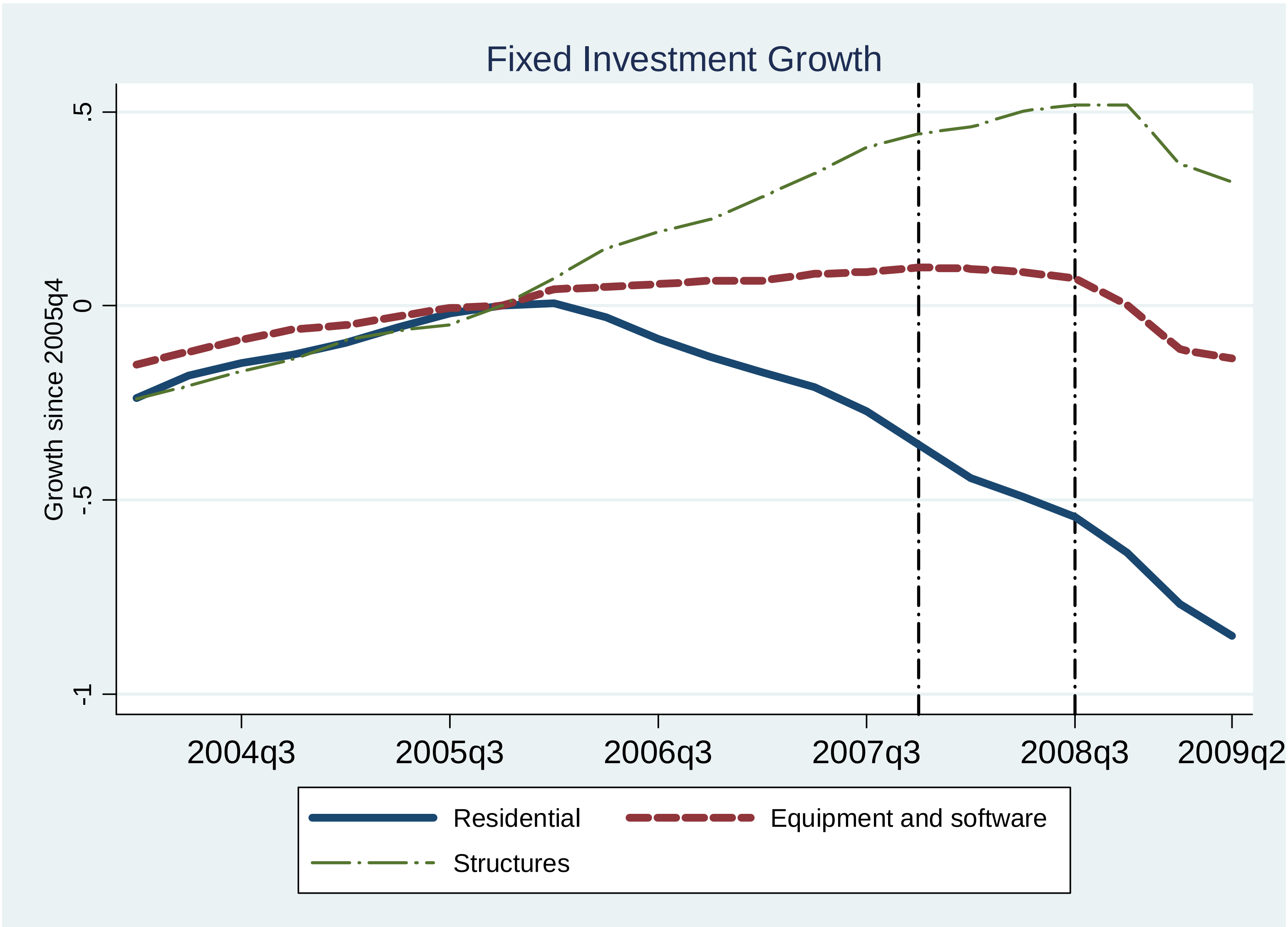
Aggregate Fact 1:
Initial Weakness Was in Household Balance Sheets



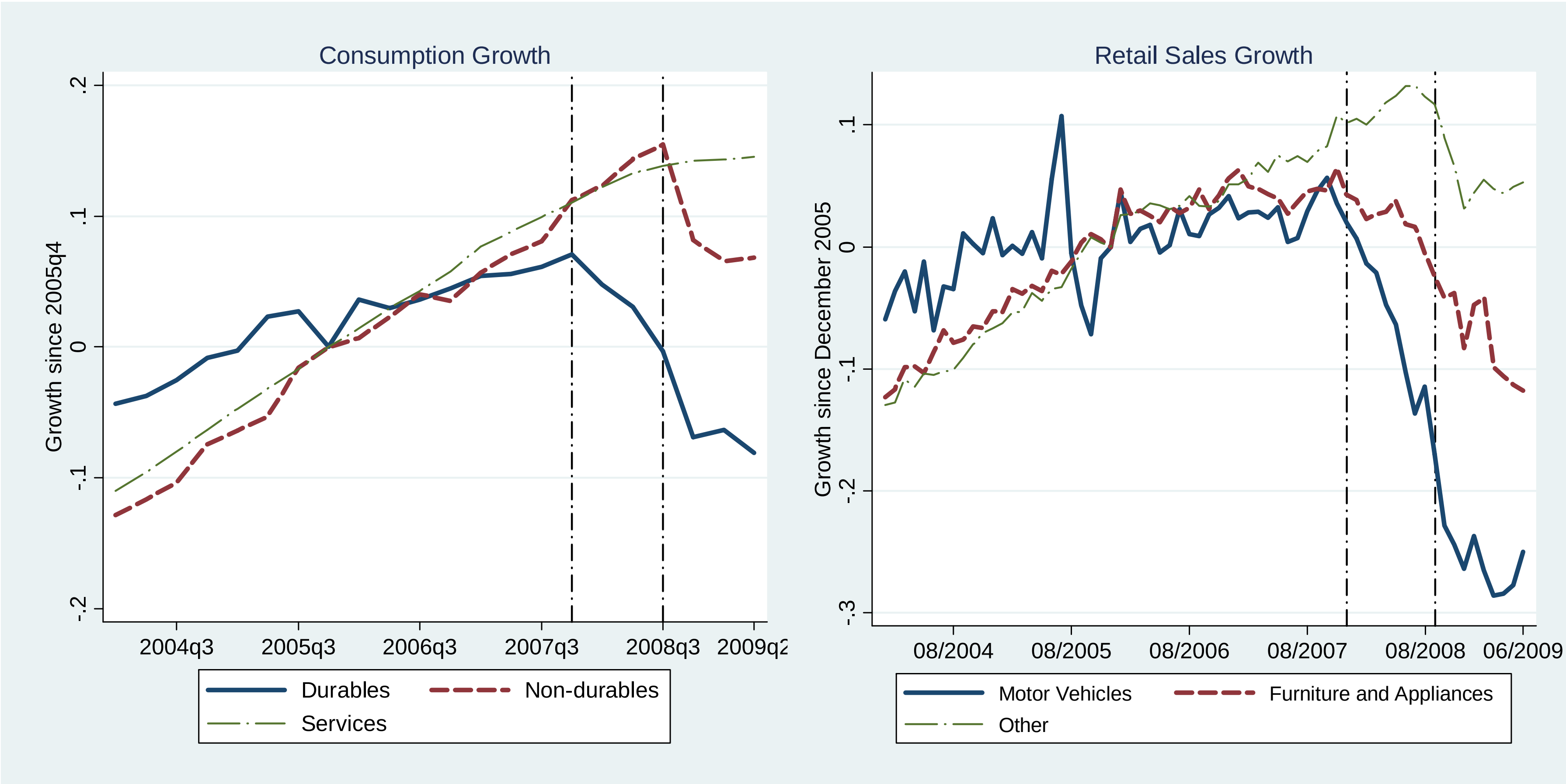
Aggregate Fact 2:
Mortgage Defaults Increased Long Before Unemployment



Aggregate Fact 3:
Real Effects Showed Up in Residential Investment First



Aggregate Fact 4:
Durable Consumption Declined Early in Cycle



Cross-Sectional Analysis of U.S. Counties

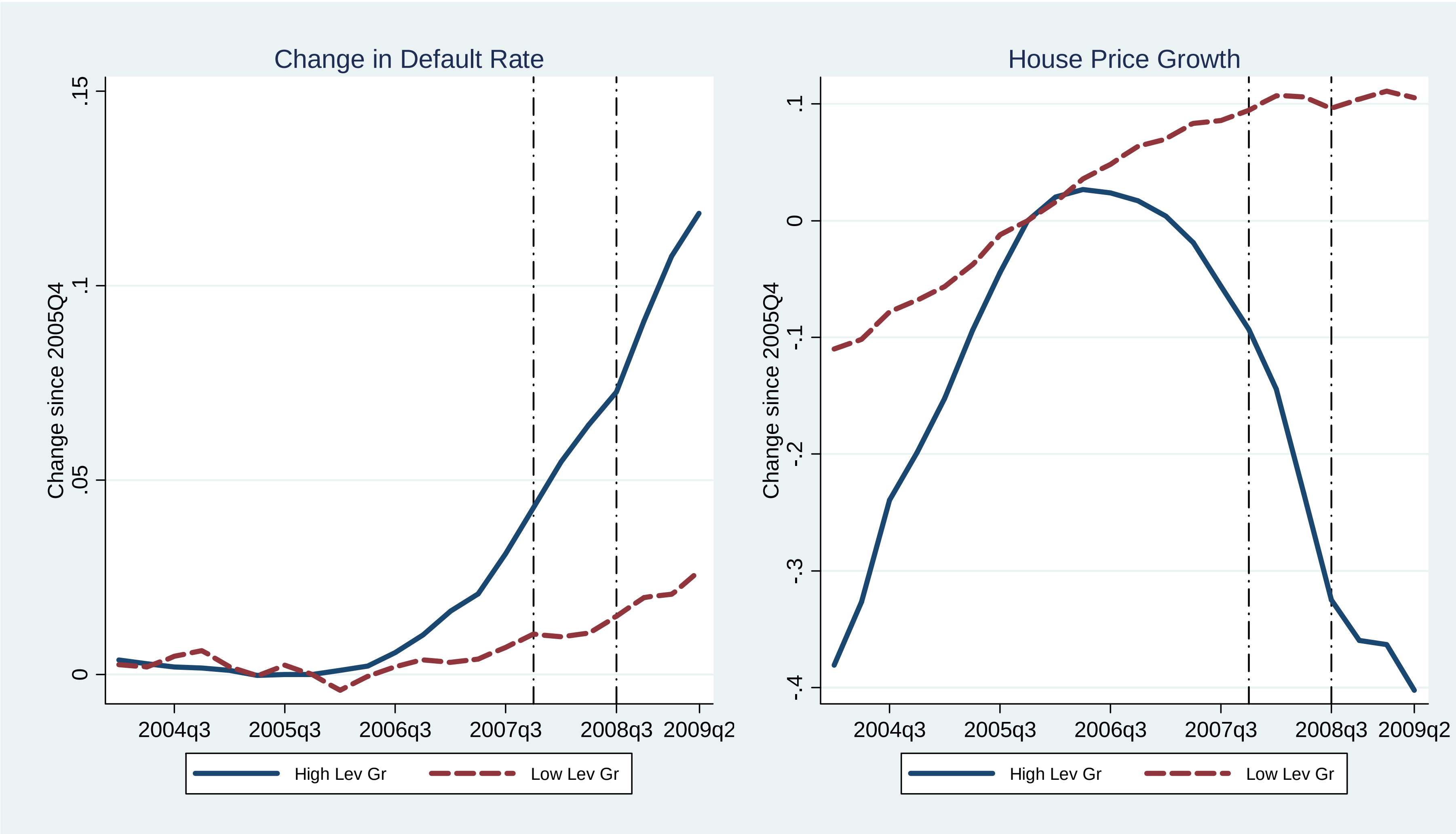
- Initial weakness in durable consumption and residential investment is consistent with effect of household leverage …
    - but it's difficult to isolate mechanisms using aggregate patterns
    - perhaps expectations of future unemployment rise, which leads to early adjustment on "big" purchases.
- Advantage of cross-sectional tests
    - Easier to discriminate between competing hypotheses
    - Can be used to directly quantify different effects

Household Leverage and the Recession

- Primary measure of leverage growth in a given county: change in debt to income ratio from 2002Q4 to 2006Q4
- Economic outcomes: defaults, house prices, auto sales, new housing building permits, and unemployment
- Two cross-sectional tests for each economic outcome:
  1. Split into “high” and “low” leverage growth counties, follow the entire time series
  2. Scatter plots of economic outcome from 2006 to 2009 against leverage growth from 2002 to 2006
- (More rigorous regressions with controls and instrument in paper but not in presentation)

Default Rates and House Prices

(from Figure 5A)

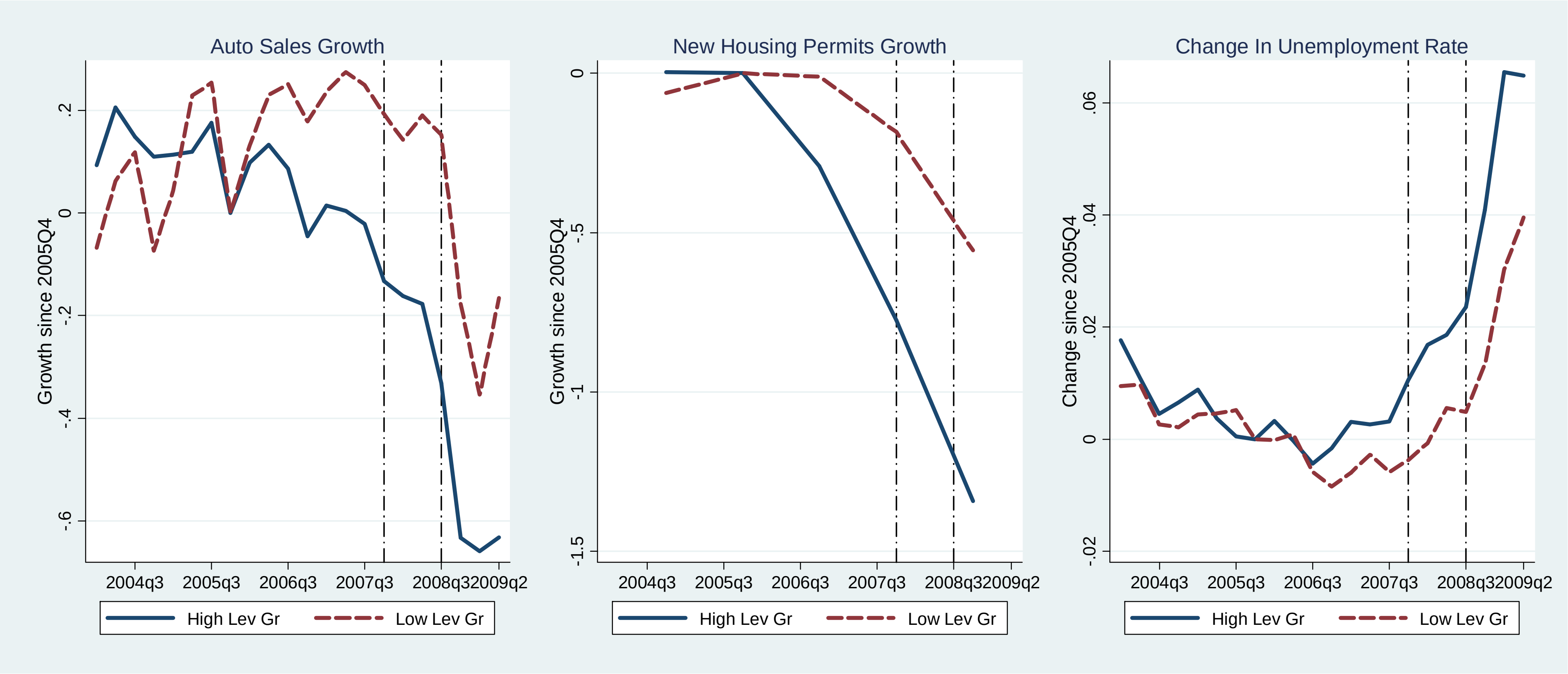


Default Rates and House Prices

(from Figure 5B)

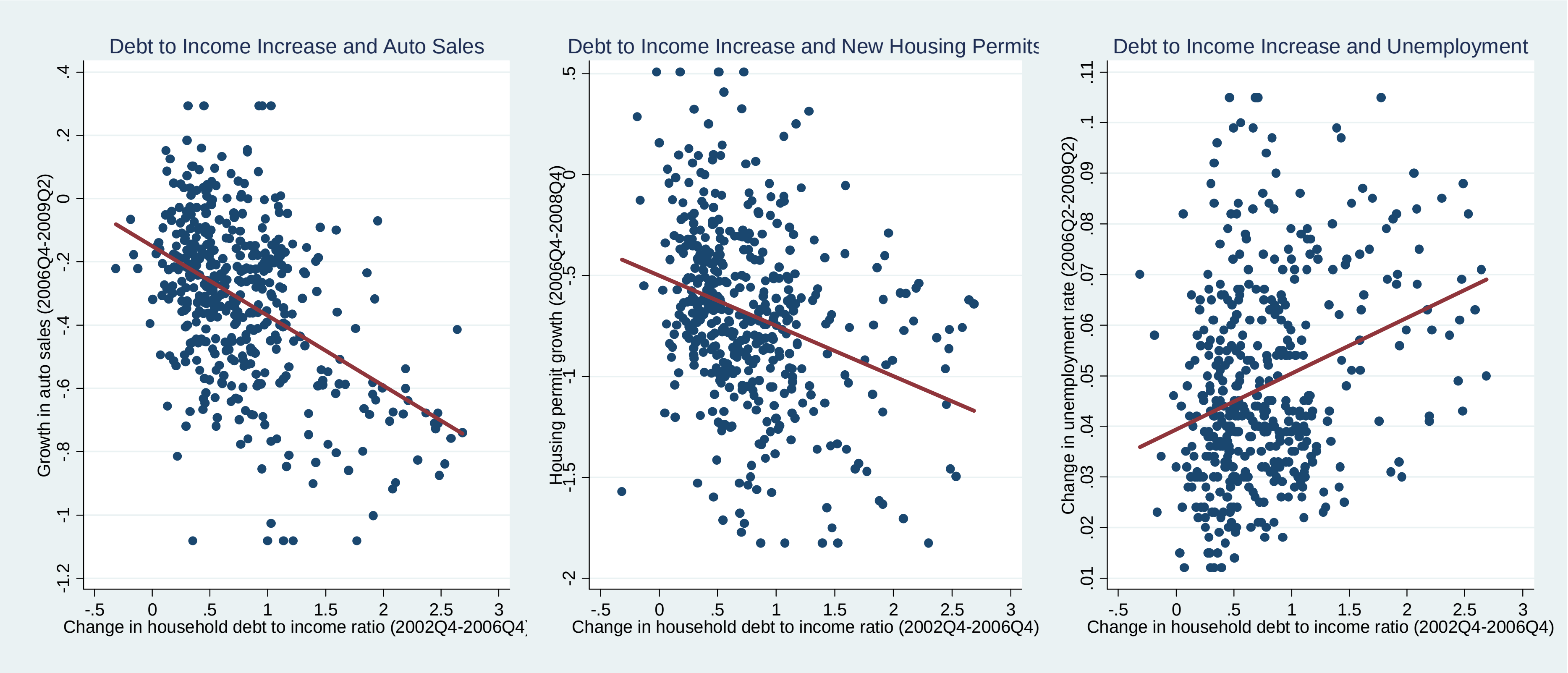
Auto Sales, New Housing, and Unemployment

(from Figure 6A)



Auto Sales, New Housing, and Unemployment

(from Figure 6B)



How Does Household Leverage Fare?

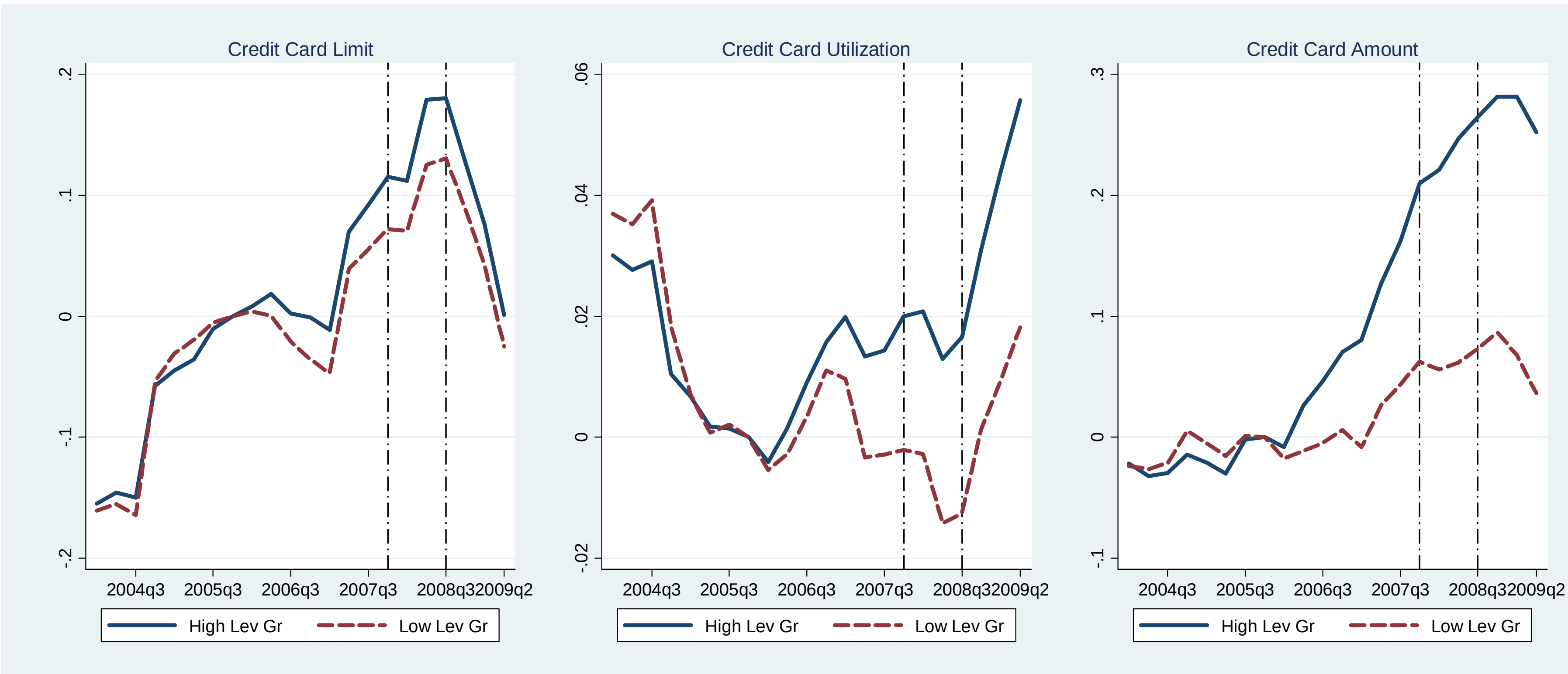
- Household leverage increase from 2002 to 2006 explains much of the variation in economic outcomes through the third quarter of 2008.

- Concurrent with the financial crisis in the fall of 2008, auto sales collapse and unemployment skyrockets in *both* high and low leverage growth counties

- Alternatively, even in low leverage growth counties, auto sales fall and unemployment rise from the fourth quarter of 2008 to the second quarter of 2009

- Why?

Credit Card Borrowing Patterns



The Financial Crisis and Household Leverage

- From the beginning of the recession through the third quarter of 2008, credit card availability increases
- Highly levered counties borrow heavily on credit cards through the third quarter of 2008
- The financial crisis leads to a sharp pull back in credit card availability
- Motivates an alternative measure of household leverage: counties that are more reliant on credit cards
- Measure: credit card utilization rate as of 2006q4 (Gross and Souleles (2004), Mian and Sufi (2009b)).

Interpretation

- The growth in household leverage from 2002 to 2006 explains almost all of the decline in durable consumption and unemployment through the third quarter of 2008
- Credit-card reliant borrowers (as measured by 2006q4 utilization) pull back on durable consumption during the financial crisis and afterwards
- Credit card utilization rates as of 2006q4 does not help explain unemployment patterns after the financial crisis

Magnitudes

- We find:

  1. The growth in household leverage from 2002 to 2006 explains the entire increase in defaults and decreases in house prices

  2. The growth in household leverage and CC utilization rates explain the entire drop in auto sales

  3. The growth in household leverage explains 20% of the increase in unemployment

     - This latter point makes sense given that goods are not generally produced where they are consumed

Alternatives

1. Construction dislocation
   - Economics go exactly the opposite: elastic housing supply MSAs with low building costs experience larger construction boom (Table 5, column 6)

2. A local financial accelerator effect? Defaults hurt local banks which in turn cut loans?
   - Results hold in 52 counties that have only national banks
   - Results hold when controlling for net charge-offs and net income of local banks

3. Traditional financial accelerator through business investment during financial crisis?
   - Non-res investment moves very late in cycle
   - Corporate defaults by 2008q4 still way below 2001 recession (in contrast to consumer defaults)

What Does this Mean for Macroeconomic Fluctuations?

- Any serious attempt to explain the downturn must hit four big facts: (i) household defaults, (ii) house price collapse, (iii) sharp decline in durable consumption, and (iv) unemployment

- We show that household leverage does a powerful job at hitting all four facts

- Household finance is critical to understanding macroeconomic fluctuations

  - Fisher (1933), Mishkin (1978), King (1994), Leamer (2007, 2009)

Why Do Household Leverage Cycles Occur?

- Taken together, our three studies suggest that we need to better understand why households expand leverage so aggressively during expansions

  - Is the cost of default for consumers extremely low?
  - Are lenders properly incentivized to reduce default risk?
  - Can financial innovation that expands credit to riskier borrowers preserve incentives?
  - Do borrowers form unrealistic expectations of future income or house price appreciation?