

# An Agent-Based Model of the Housing Market

By Many

Discussion by

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# Preliminaries

- There is no paper that describes the agent-based model in detail
- I got the slides yesterday morning

# Logic

- Macroeconomic models must appreciate heterogeneity if we are to understand (dangerous) trends in economy
- Heterogeneity needed to appreciate importance of non-price terms in driving trends (LTV, collateral)
- The best way of empirically using heterogeneity to understand trends is an agent-based model

# Logic

- Macroeconomic models must appreciate heterogeneity if we are to understand (dangerous) trends in economy [agree]
- Heterogeneity needed to appreciate importance of non-price terms in driving trends (LTV, collateral) [agree, some qualification]
- The best way of empirically using heterogeneity to understand trends is an agent-based model [could be convinced]

# Representative Agent-Based Models

- If we are serious about understanding dangerous trends, we must depart from representative-agent based models
- Big drawbacks
  1. No room to appreciate importance of debt
  2. Consumption-risk sharing fails spectacularly in the data
  3. “Shocks” in representative agent-based models very unsatisfactory (although perhaps also true of models based on heterogeneity!)

# Most Important Source of Heterogeneity?

1. Geanakoplos – heterogeneity in beliefs leads naturally to leverage, LTV, price movements
2. Heterogeneity in exposure to binding borrowing constraints (or cash-in-advance constraint)
  - Corporate finance approach (BG, KM, HK, BS)
  - Household finance approach (EK, GL, MP)
- Matters for thinking of most important “exogenous” shocks – potential issue with LTV versus interest rates framing?

# Taking these Models to Data?

- In a series of papers with Atif Mian, we have “tested” constraint-based models by taking seriously their cross-sectional implications
- Example, among those facing constraint, examine income, leverage, HP, consumption, etc.
- Can be done in real time (“Bad Leverage” paper)
- Key difference with agent-based modeling – less structure imposed on empirical estimation

# Example: Household Debt, 2002 - 2007

1. Determine who are marginal borrowers who have a very high elasticity of borrowing with respect to credit availability
  - My measure: Subprime share or CC utilization rates

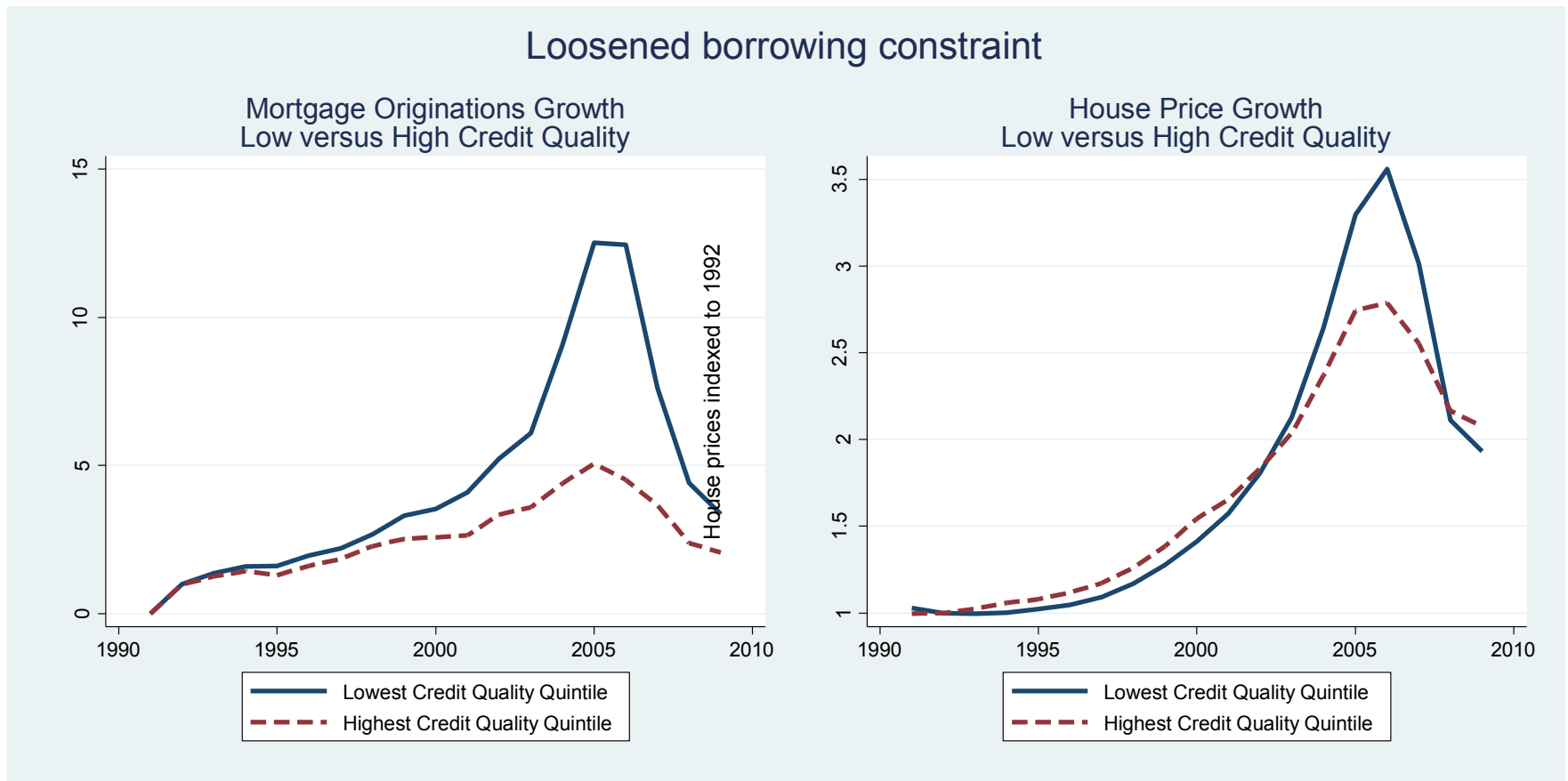


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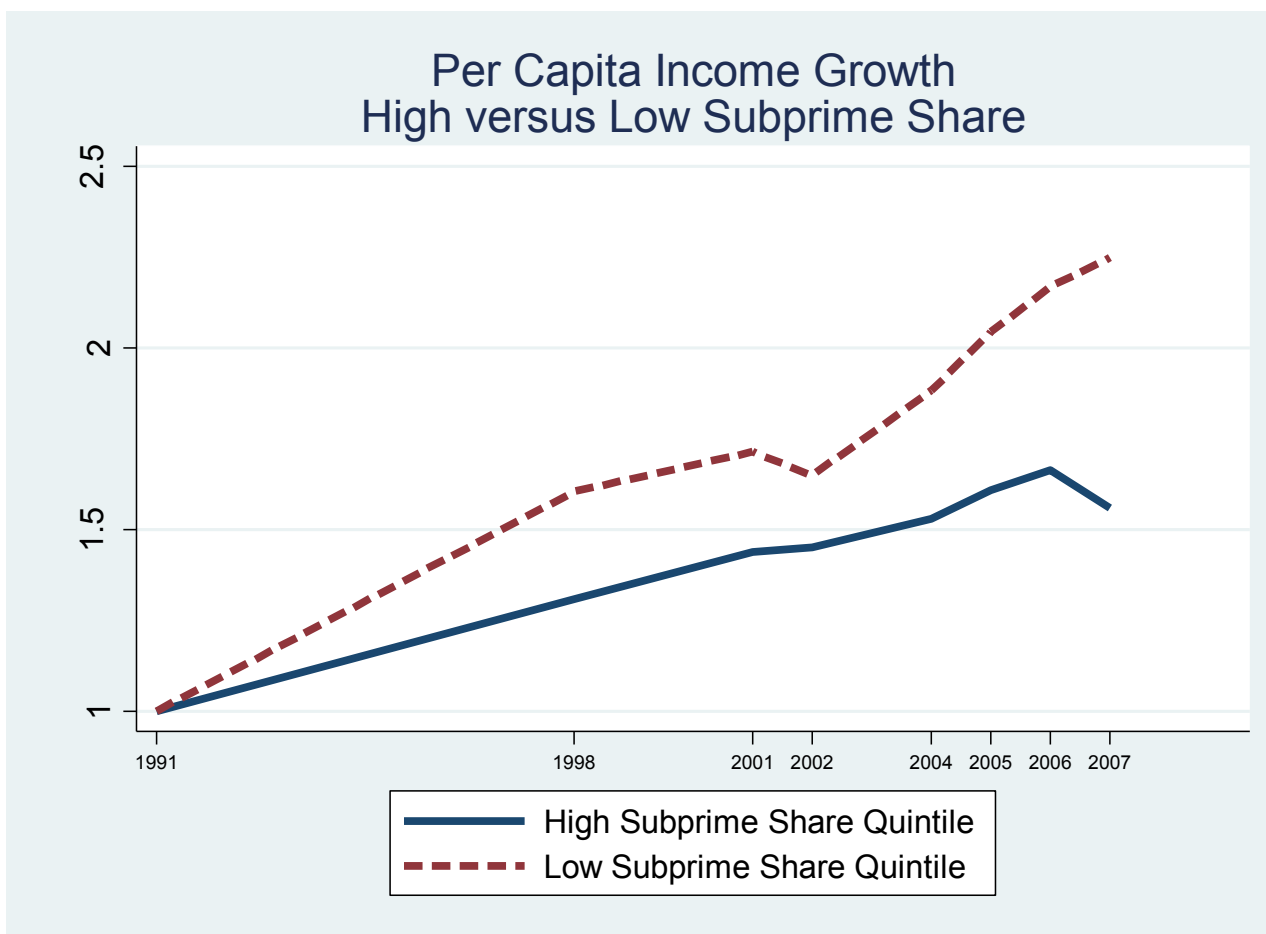
# Step #2: Credit and Marginal Borrowers

2. Has the flow of credit to these marginal borrowers increased substantially relative to non-marginal borrowers?  
YES



# Step #3: Income Growth of Marginal Borrowers

3. Is the relative increase in the flow of credit to marginal borrowers driven by productivity/permanent income shocks? NO.



# Comparing Approaches

- Advantages of the agent-based model
  1. Easier to assess quantitative significance
  2. Can easily model counter-factual policy
  3. Model provides discipline on data moments that are “interesting”
- Disadvantages
  1. Too tied to specific theory, LTV
  2. Lack of transparency (can be overcome)
  3. Model manipulation too easy

## Final Note

- General equilibrium is extremely difficult, both with more reduced form approach and agent-based modeling
- Empirical macro studies using micro data becoming more popular, but must always think carefully about GE effects
- Mainstream macro will only buy into heterogeneity if GE effects carefully considered

# Conclusion

- Think seriously about precisely the advantages structure gives you
- Augment study with simple comparative statics to illustrate how model works
- I'm definitely interested to see more ...