

# Financial Literacy and Mortgage Outcomes

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# Acknowledgement and Disclaimer

- Conducted at the Center for Behavioral Economics and Decision Making at the Federal Reserve Bank of Boston
- The views expressed here are solely those of the authors and not of the Federal Reserve System.

# Did Borrowers Make Informed Decisions?



Source: The Economist.

# Adjustable-Rate Mortgages Prone to Default

- Differences in observed borrower characteristics (FICO, DTI) or loan characteristics (LTV, documentation status) are small.



*Note:* Own calculation based on subprime sample from McDash Analytics, LLC data. Subprime first-lien mortgages used for home purchases only.

# What is the right interpretation of this difference?

- **Product:** Do ARMs simply provide stronger incentives to default as house prices decline?
- **Borrowers:** Do worse borrowers select into ARMs?
- **Product** × **Borrowers:** Do borrowers select into ARMs, not anticipating how to handle difficult times?

## Research Question: What is the role of financial literacy?

- Do financially illiterate borrowers select into risky products?
  - Are they more likely to have ARMs, high leverage?
  - Are they aware of the terms of their mortgage?
- Is financial literacy associated with delinquency? (later this year)
  - Is the association specific to ARMs?

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# Behavioral Biases and Credit Markets

- Are borrowers well-equipped to make financial decisions?

- Borrowers make informed decisions

*“(...) I am more open to the idea that some borrowers were making rational decisions about risk and rewards. Providing more information would not change these people’s decisions.” (Ian Ayres in NYtimes.com, October 14, 2008)*

- Borrowers make uninformed decisions

*“Many (...) buyers who took out high loan-to-value mortgages with adjustable rates did not have ready access to information about what they were doing (...) and so made serious mistakes” (Robert Shiller in Wall Street Journal, October 9th, 2008)*

*“Take the greed and the financial misrepresentation out of it, and the root of this crisis is massive levels of financial illiteracy” (John Bryant in The Economist, April 3rd, 2008)*

# Behavioral Biases and Credit Markets

- Literature on consumption paints bleak picture of financial literacy, and shows associations with "bad" outcomes.
  - Many individuals get even most basic questions wrong.
  - Financially illiterate individuals have lower retirement savings (Banks and Oldfield, 2007) and engage less in planning for retirement (Lusardi and Mitchell, 2005).
  - Less financially literate incur more debt (Stango and Zinman, 2008).
  - Low ability to budget finances is associated with lower household assets (Ameriks et al., 2003).
- Literature on mortgage choice is largely silent on role of financial literacy on mortgage choice.
- ▷ Results raise possibility that financial literacy plays an important role in mortgage choices.



# Our Research

- Survey of 585 subprime borrowers in the North East
  - Financial literacy questions
  - Questions about their mortgages
- Combine survey and actual mortgage outcomes (N=348)
  - Actual mortgage info from Registry of Deeds and Loan Performance
  - For a matched sample of subprime borrowers (vintage 2005/06)...
    - Written invitation to participate in 15-minute phone survey.
    - Called subjects to conduct survey<sup>1</sup>
    - Participants received \$20
  - We match their survey answers to the actual mortgage information

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<sup>1</sup>No diff. in observable characteristics between participants and non-participants

# The Data

Registry of Deeds/LP		Survey Questions
ARM or FRM	↔	ARM or FRM? <sup>a</sup>
Mortgage Amount		
Low Doc		
FICO		
etc.		
		HH income
		Demographics
		Immigrant status
		Preferences
		etc.
	←	<b>Financial literacy</b>

<sup>a</sup>“Does your mortgage have a fixed interest rate and monthly payment or does your mortgage have an interest rate and monthly payment that can change in the future (that is, a variable rate)?”

# Financial Literacy

## Financial Literacy Questions (Banks and Oldfield, 2007)

- 1 In a sale, a shop is selling all items at half price. Before the sale, a sofa costs \$300. How much will it cost in the sale?
- 2 If the chance of getting a disease is 10 per cent, how many people out of 1,000 would be expected to get the disease?
- 3 A second hand car dealer is selling a car for \$6,000. This is two-thirds of what it cost new. How much did the car cost new?
- 4 If 5 people all have the winning numbers in the lottery and the prize is \$2 million, how much will each of them get?
- 5 Let's say you have \$200 in a savings account. The account earns ten per cent interest per year. How much will you have in the account at the end of two years?

- Following Banks and Oldfield (2007), we classify borrowers into four groups of financial literacy:  
I: worst (15%), II (57%), III (18%), IV: best (11%)

# Does Financial Literacy Affect the Contract Choice?

## 1 Results

- What Contract Did The Borrowers Sign?
- What Contract Do The Borrowers Think They Signed?

## 2 Conclusion

- Summary
- Questions for Further Research

# Does Financial Literacy Affect Mortgage Choices?

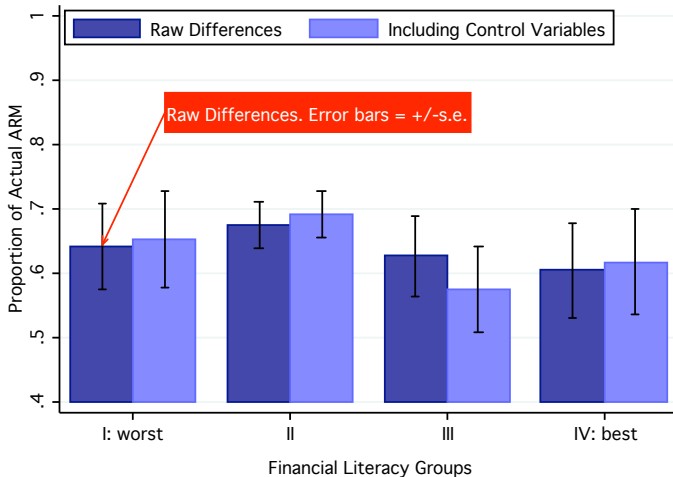
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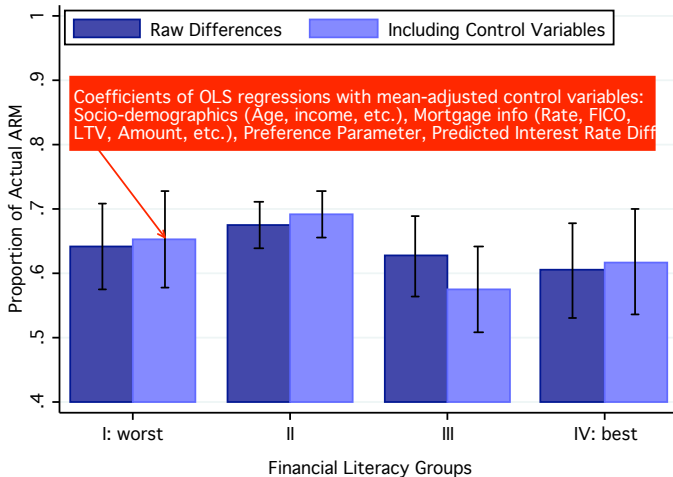
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# Financial Literacy and ARMs



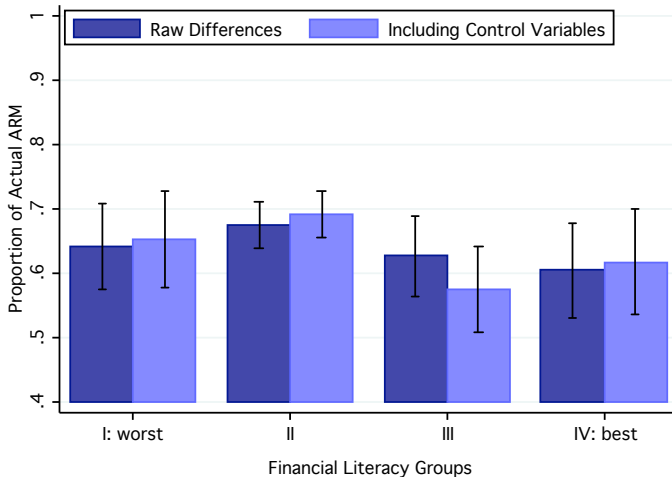
*Note:* N = 316. Control variables: Socio-demographics, mortgage info, preferences, and predicted interest rate difference between ARM and FRM.

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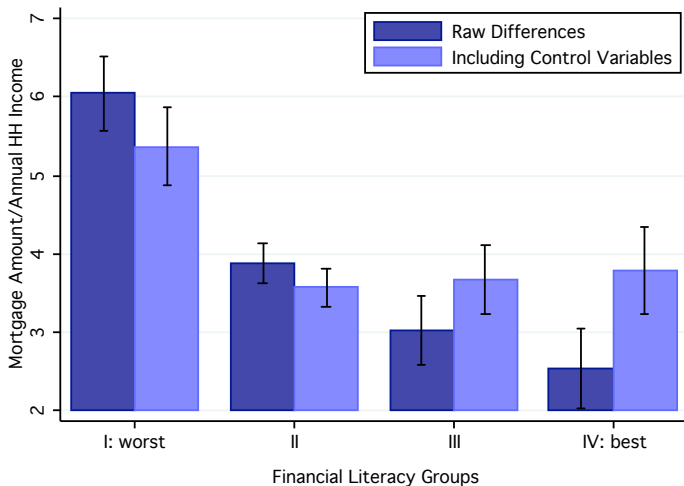
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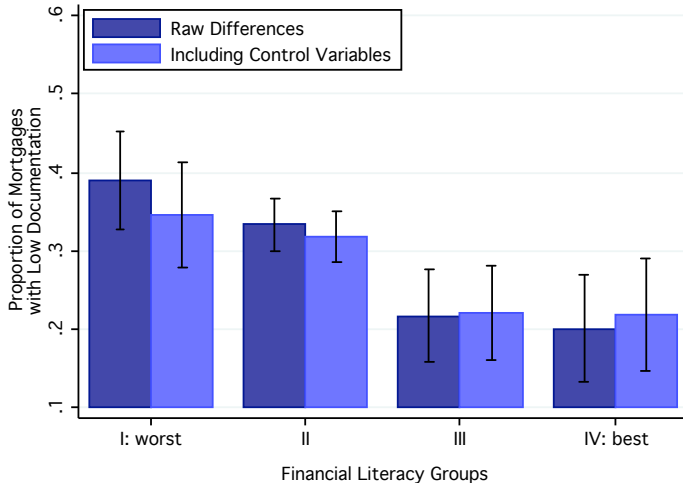


# Debt-to-Income



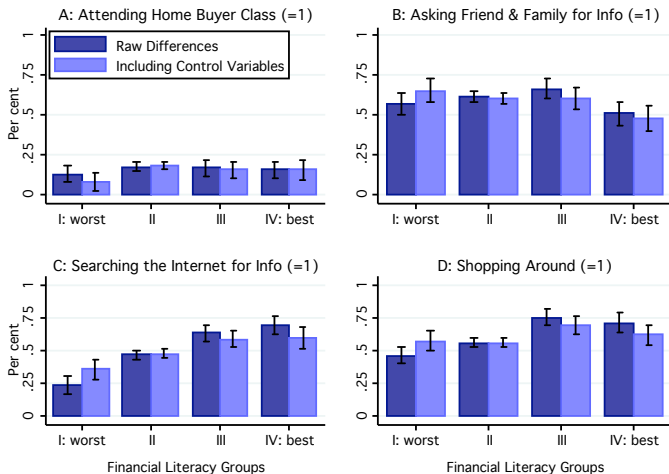
Note: N = 329. Control variables: Socio-demographics, and Mortgage info.

# Verification of Borrower's Income and Asset (Low Doc)



Note: N = 331. Control variables: (1) Socio-demographics, and (2) Mortgage info.

# Financial Literacy and Search Behavior



Note: N = 331. Control variables: Socio-demographics.

## Summary & Interpretation

- Financial literacy is not correlated with the choice of adjustable-rate mortgages.
- ▷ Financial illiterate individuals are as likely to get complicated contract as sophisticated individuals
- Further results show that low financial literacy is associated with some differences in mortgage choices.
  - More likely to have low-doc loan.
  - Higher mortgage-to-income ratio.
  - Tend to search less for information / competing offers.
- ▷ Consistent with results from consumption literature. Broadly "worse" outcomes and little planning associated with poor financial literacy.

# Does Financial Literacy Affect Mortgage Choices?

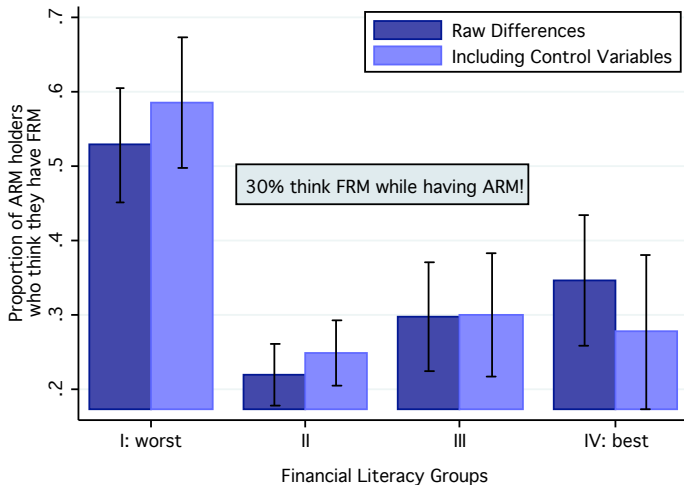
## 1 Results

- What Contract Did The Borrowers Sign?
- What Contract Do The Borrowers Think They Signed?

## 2 Conclusion

- Summary
- Questions for Further Research

# Do Borrowers Know That They Have an ARM?



Note: N = 208. Control variables: Socio-demographics.

# Summary & Interpretation

- Large fraction do not know basic terms of their mortgage
- Least financially literate are most likely to think that they have a FRM when they have an ARM
- ▷ Financial illiteracy leads individuals to have other contracts than they think they have (than they want to have?)
- ▷ Does this mistake predict default on mortgages?

# Does Financial Literacy Affect Mortgage Choices?

## 1 Results

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- **Summary**
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# Summary

- Our research provides evidence whether financial literacy is a serious concern in the mortgage market
- The results show
  - Like in earlier studies, lack of basic financial literacy is widespread in population of subprime borrowers. We also find that many borrowers are wrong about crucial aspects of their mortgage.
  - Financial literacy is associated with some differences in mortgage terms and choices, but **does not predict propensity to have ARM** instead of FRM.
  - However, financial literacy predicts who mistakenly thinks they have an FRM.

# Does Financial Literacy Affect Mortgage Choices?

## 1 Results

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# So what explains the abysmal performance of ARMs?

- Our results do not favor a simple selection story as an interpretation of high ARM defaults.
- ▷ Differences in financial literacy do not predict the type of mortgage they chose.
- However, our results leave open the possibility that individuals were unaware of the contracts they got themselves into. Then they lost control as market conditions got worse.
- ▷ Evidence on default rates will address this issue.

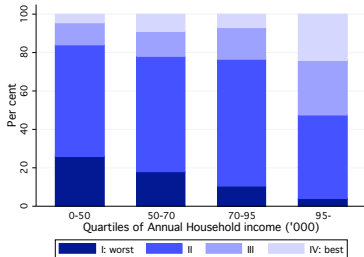
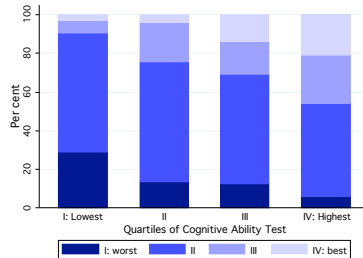
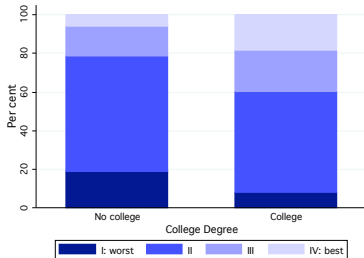
**THANK YOU**

# Financial Literacy among Subprime Borrowers

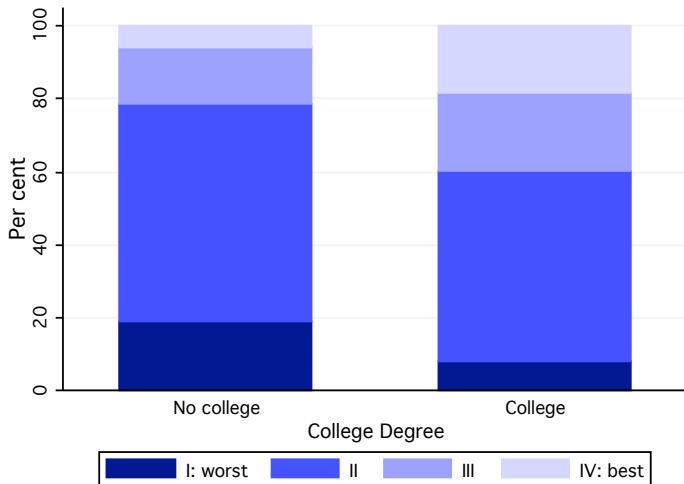
Classification	Description	N	Proportion
Group I: worst	Either: q1,q2, q3 all incorrect Or: q1 correct; q2, q3, q4 all incorrect	85	15%
Group II	At least one of q1, q2, q3, q4 incorrect	331	57%
Group III	q1, q2, q3, q4 all correct; q5 incorrect	104	18%
Group IV: worst	q1, q2, q3, q4, q5 all correct	65	11%

*Notes:* Following Banks and Oldfield (2007).

# Financial Literacy Measure

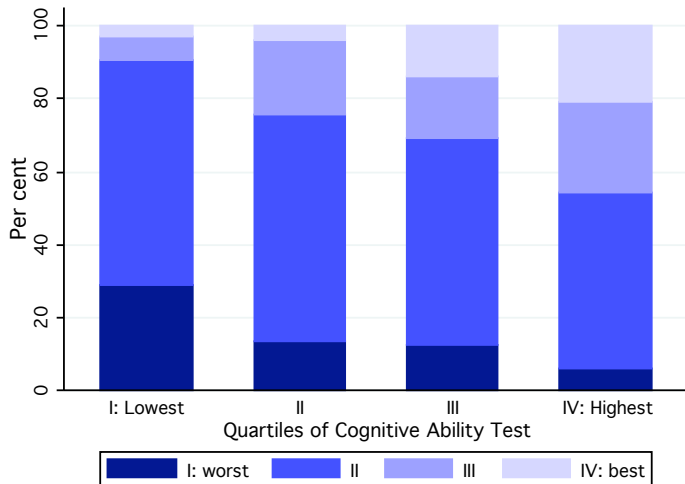


# Financial Literacy and College



Note: N=585. Source: Own survey, 2008.

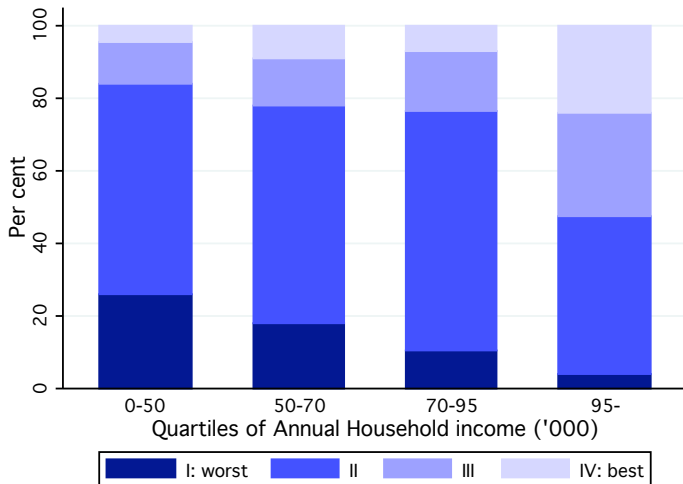
# Financial Literacy and Cognitive Abilities



*Note:* Cognitive abilities measured with a verbal fluency test (Lang et al. 2007). N = 585. *Source:* Own survey, 2008.

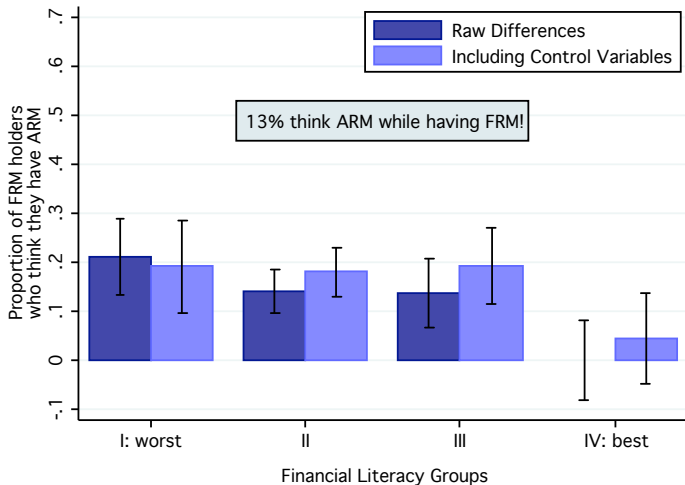


# Financial Literacy and Income Quartiles



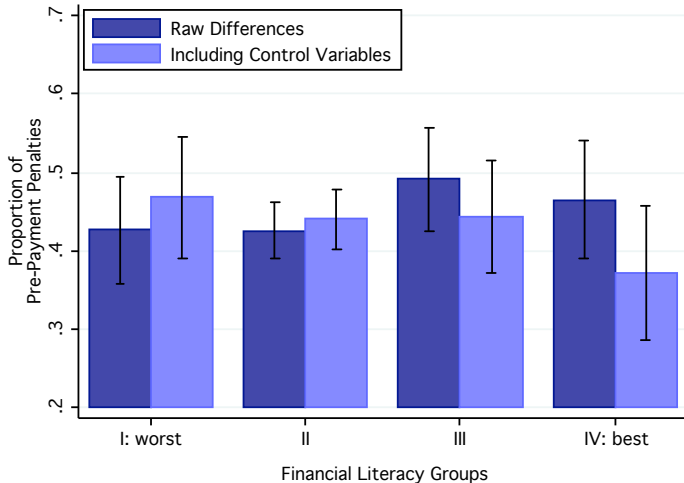
Note: N = 575. Source: Own survey, 2008.

# Do Borrowers Know That They Have a FRM?



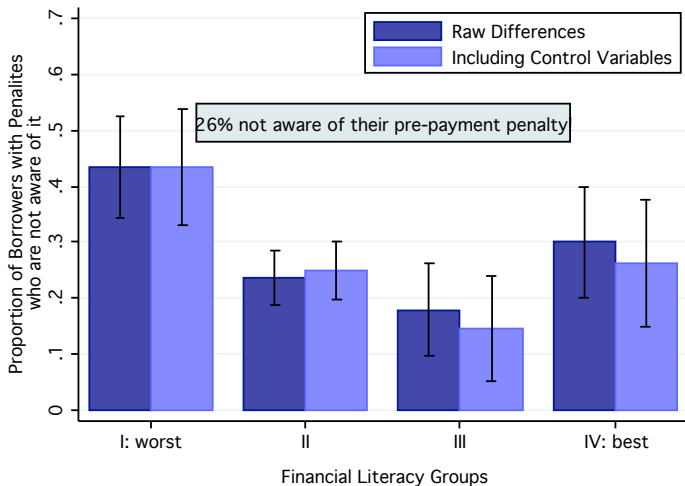
Note: N = 108. Control variables: Socio-demographics.

# Pre-Payment Penalty



Note: N = 325. Control variables: (1) Socio-demographics and (2) Mortgage info.

# Knowledge About Existence of Prepayment Penalty



Note: N = 143. Control variables: (1) Socio-demographics.