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# OECD-Brazilian International Conference on Financial Education

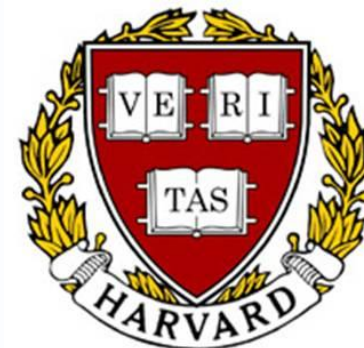
## Debt Literacy, Financial Experiences and Overindebtedness

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(Joint work with Peter Tufano, HBS)



# Why are these topics important?

- **Increase in individual responsibility**
  - Changes in the pension landscape: from DB to DC pensions
- **Complexity of financial instruments**
- **Sharp increase in debt**
  - In 2008, \$950 billion in credit card borrowing
- **Consequences of financial mistakes at the micro and macro level**



# What we do in this paper

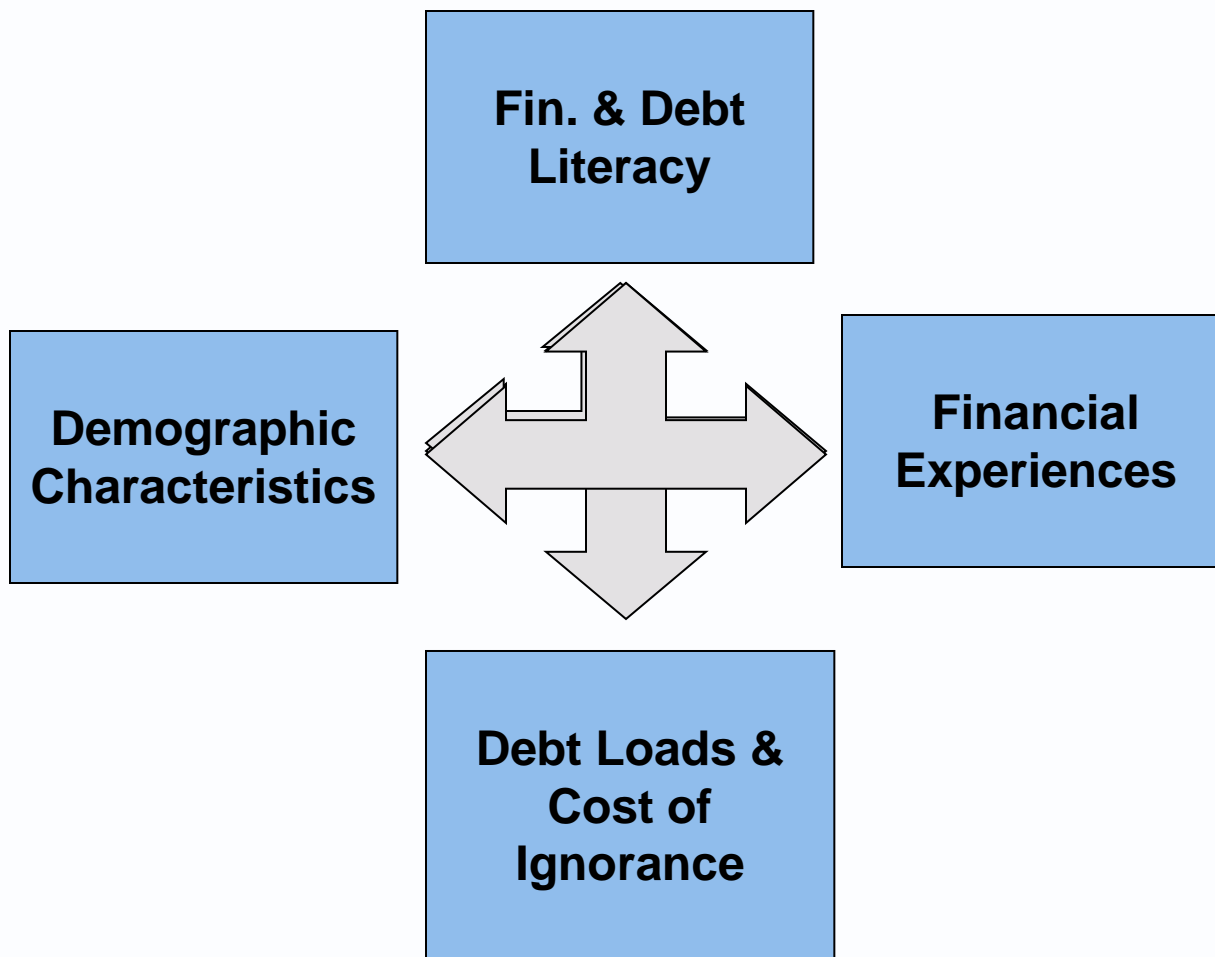
- **Questions:**
  - Are individuals *debt literate*?
  - How is *debt literacy* related to demographics, *financial experiences*, and consumer *overindebtedness*?
  - What is the cost of ignorance?



# Approach and findings

- **Approach: Partner with market research firm to design and deliver a timely survey**
- **Innovations:**
  - Debt literacy measures,
  - Actual vs. perceived literacy,
  - Metrics for financial experiences,
  - Self-assessed debt loads,
  - Evaluation of the cost of ignorance
- **Findings: Debt literacy is low and linked to financial experiences and debt loads. The cost of ignorance is high.**

# The flow of the analysis



# Survey partner and methodology

- **Worked with TNS Global, leading market research firm.**
  - Market research firm for leading brands
  - Operate in 80 countries
  - Global leader in opinion polling, political and social research
- **TNS conducted a survey of 1000 adults by phone in Nov. 2007**
- **Weights are constructed to make sample representative of US population (with respect to age, gender, income, household size, region, market size)**
- **Survey provides information on demographics (including income and wealth)**
  - Added a module on debt literacy, financial transactions and debt behavior



# Debt literacy

- **While we have a few surveys on financial literacy, we have little information on debt literacy**
  - Design three new questions
- **Seek to test mastery of debt concepts in context of everyday decisions**
  - Interest compounding as it relates to debt growth
  - Minimum payments to eliminate debt
  - Financing of consumer purchases and time value of money.
- **Also collect broader self-assessment of financial knowledge**
  - Can rely on a comprehensive measure of knowledge, including knowledge toward debt
  - Can compare self-reported with actual knowledge

# Debt Literacy: Interest compounding

Suppose you owe \$1,000 on your credit card and the interest rate you are charged is 20% per year compounded annually. If you didn't pay anything off, at this interest rate, how many years would it take for the amount you owe to double?

- 2 years
- Under 5 years
- 5 to 10 years
- More than 10 years
- Do not know
- Prefer not to answer

Interest compounding	Percent
2 years	9.6
<b>Less than 5 years (correct)</b>	<b>35.9</b>
5 to 10 years	18.8
More than 10 years	13.1
Do not know	18.3
No answer	4.3



# Debt literacy: Minimum payments on credit cards

You owe \$3,000 on your credit card. You pay a minimum payment of \$30 each month. At an Annual Percentage Rate of 12% (or 1% per month), how many years would it take to eliminate your credit card debt if you made no additional new charges?

- Less than 5 years
- Between 5 and 10 years
- Between 10 and 15 years
- Never
- Do not know
- Prefer not to answer

Credit card payment	Percent
Less than 5 years	3.8
Between 5 & 10 years	12.4
Between 10 & 15 years	21.6
<b>Never (correct)</b>	<b>35.4</b>
Do not know	21.7
No answer	5.1

# Debt literacy: Loaning money to a retailer

You purchase an appliance which costs \$1,000. To pay for this appliance, you are given the following two options: a) Pay 12 monthly installments of \$100 each; b) Borrow at a 20% annual interest rate and pay back \$1,200 a year from now. Which is the more advantageous offer?

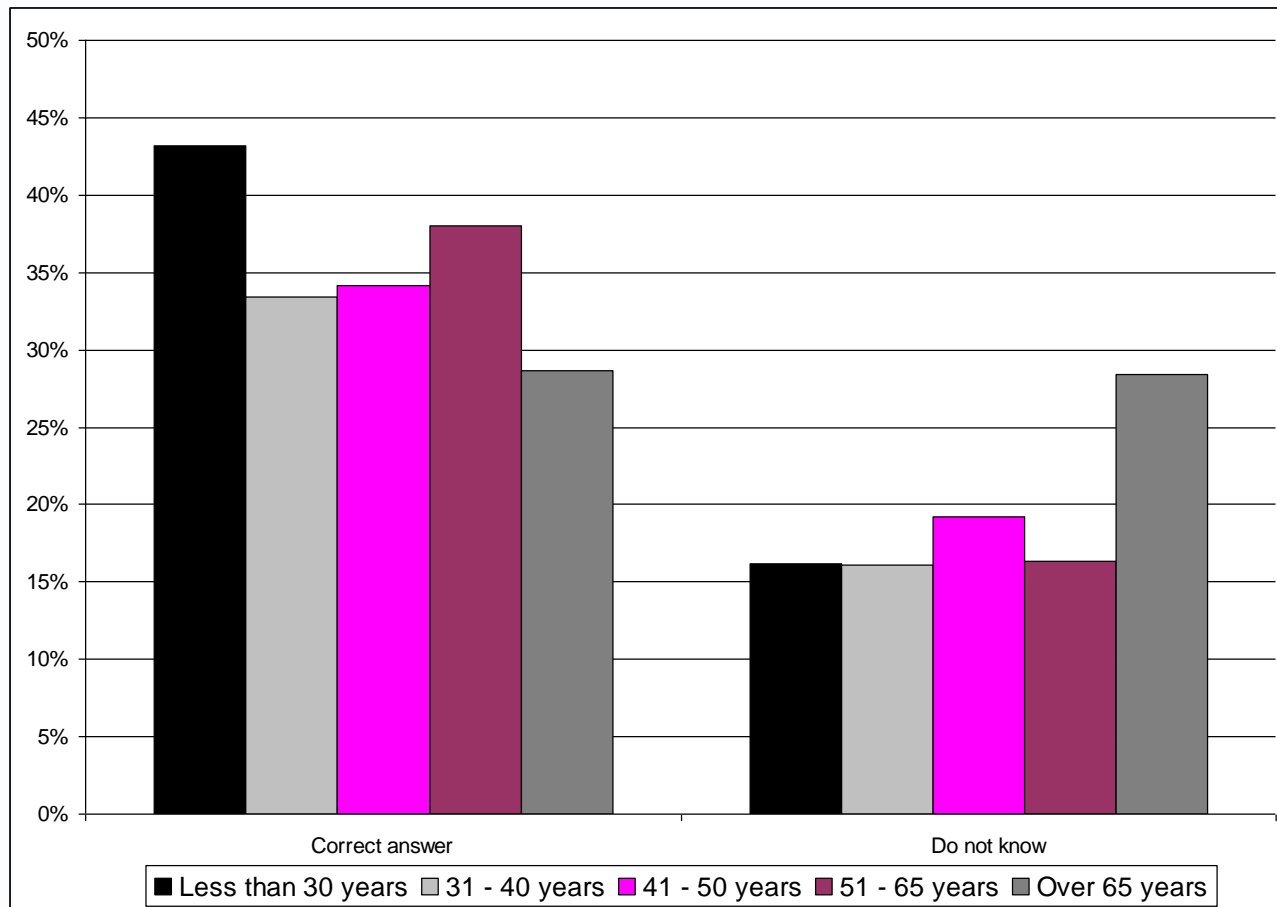
- Option (a)
- Option (b)
- They are the same
- Do not know
- Prefer not to answer

Appliance payment	Percent
Option a	40.6
<b>Option b (correct)</b>	<b>6.9</b>
They are the same	38.8
Do not know	9.2
No answer	4.5

# Who has lower debt literacy?

## Differences across age groups

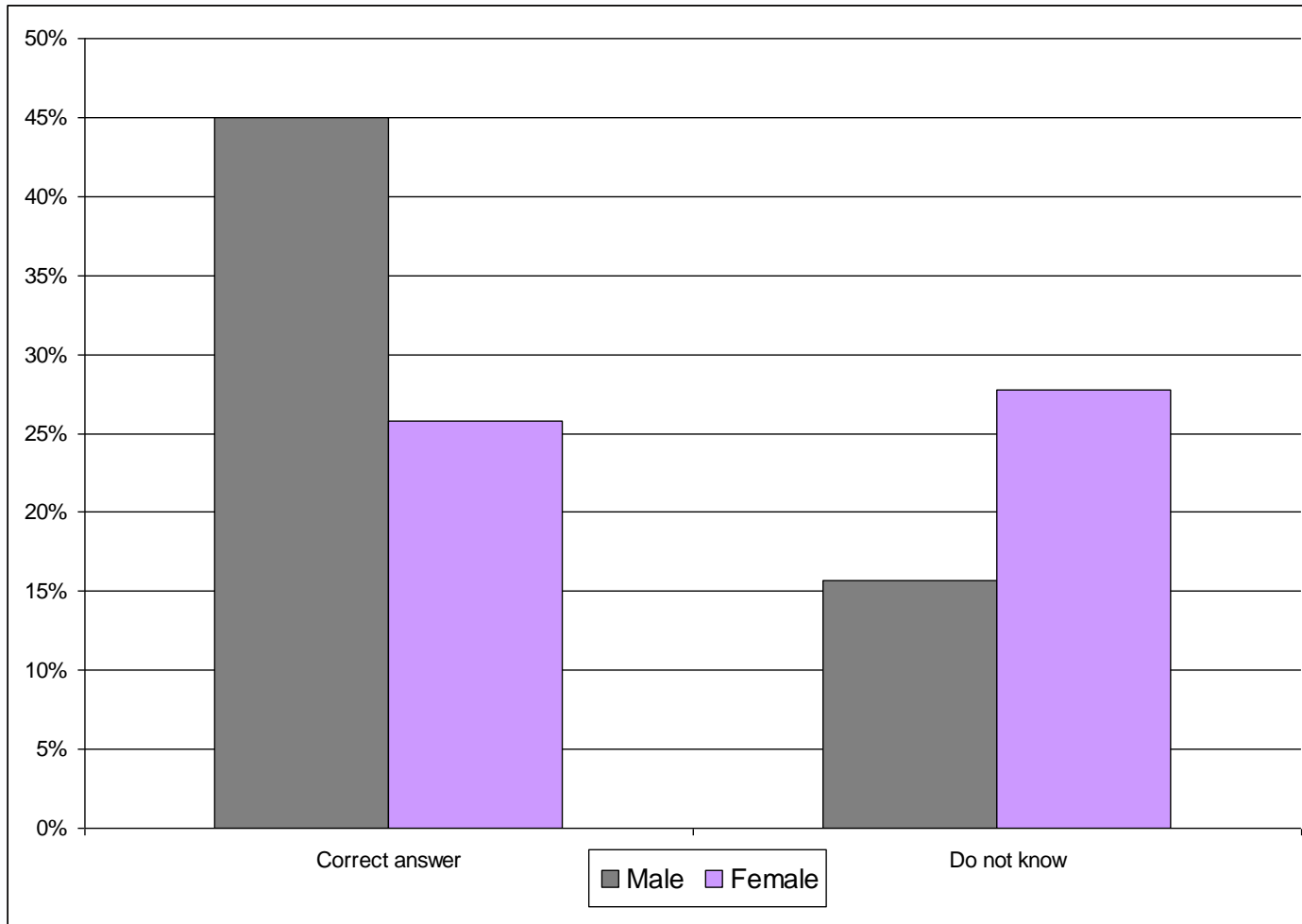
Percent answering interest compounding question correctly or “do not know” by age



# Who has lower debt literacy?

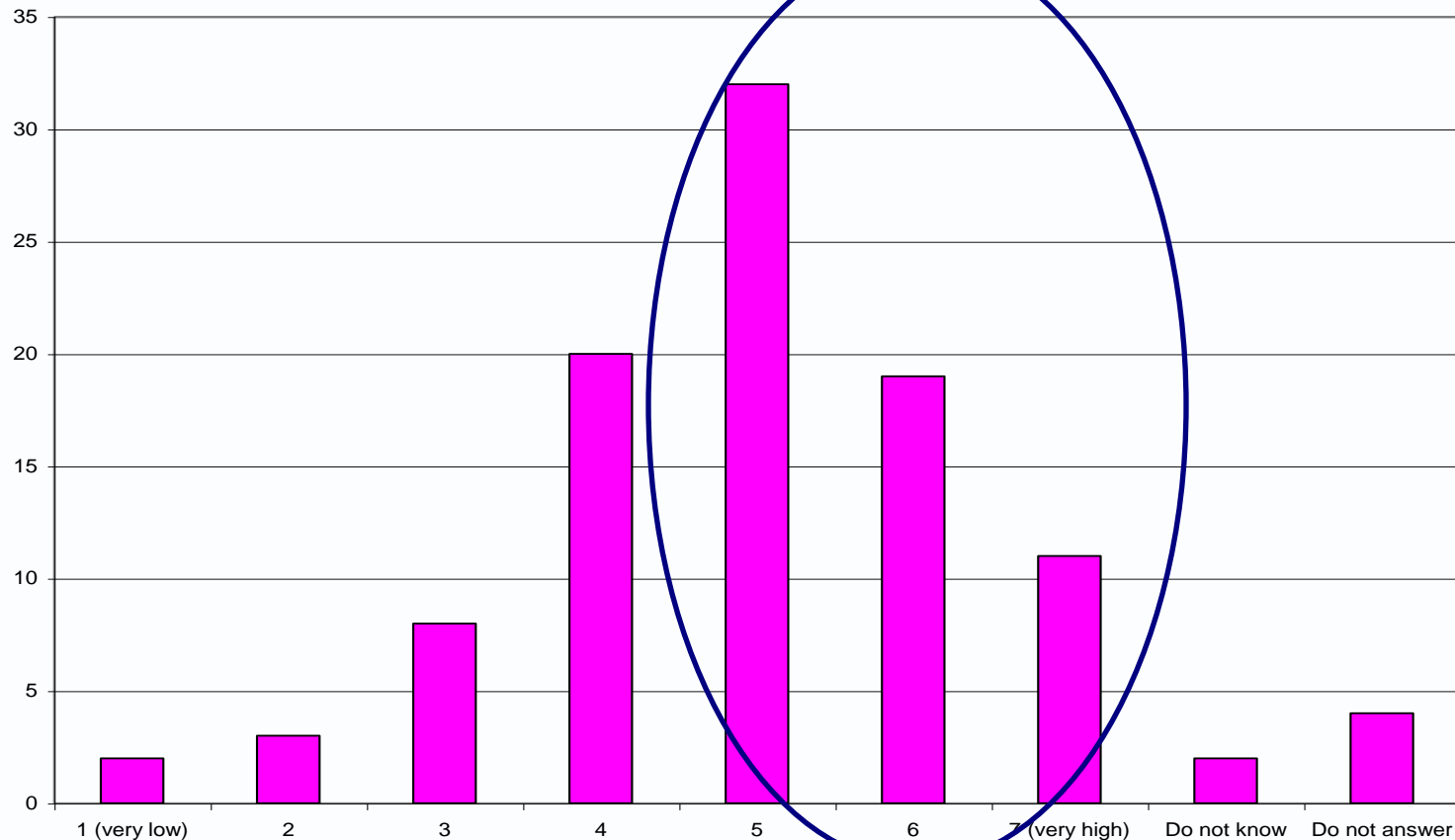
## Differences between men and women

Percent answering credit card question correctly or “do not know” by gender



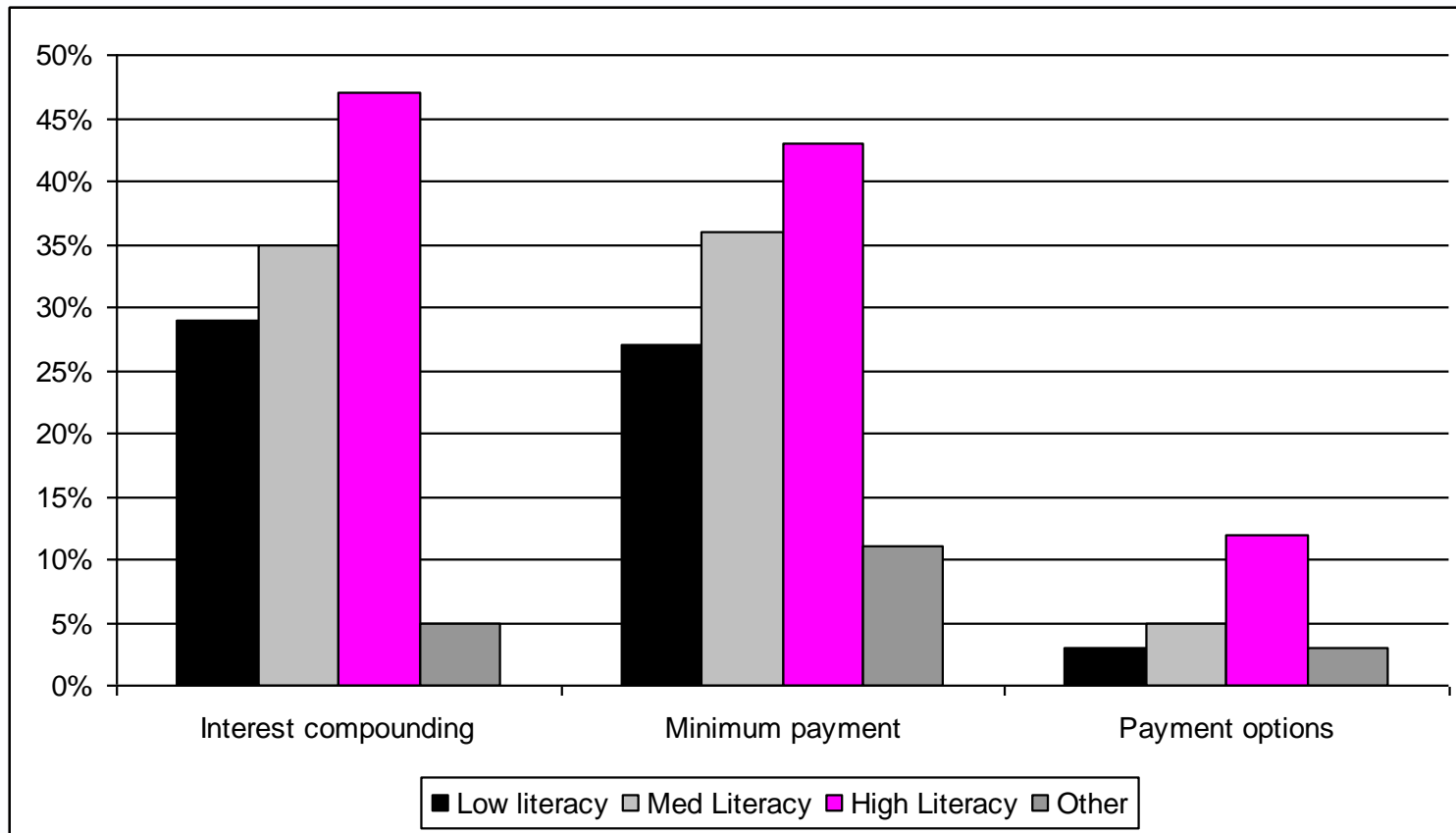
# Financial Literacy: Self-assessed financial knowledge

On a scale of 1 (very low) to 7 (very high), how would you assess your overall financial knowledge?



# Debt literacy: People are self-aware... but still mostly wrong

Percent answering correctly by self-assessed literacy



# Financial Experiences

- **Measuring financial experiences. Ask about prior use of:**
  - Traditional investing products (e.g., stocks, bonds, mutual funds)
  - Traditional borrowing products (e.g., auto loans, student loans, mortgage)
  - Alternative financial borrowing (e.g., payday loan, tax refund loan)
  - Current credit card usage patterns (pay in full, carry balance, no cards)

# What is incidence of financial experience?

In the last 12 months, which of the following describes your use of credit cards?	Sample mean
I always paid my credit cards in full	36.75%
I don't have any credit cards or did not use them	20.62%
In some months, I ran an outstanding balance and paid finance charges	30.75%
In some months, I paid the minimum payment only	21.28%
In some months, I was charged a late charge for late payment	7.58%
In some months, I was charged an over the limit charge for charges exceeding my credit line	4.42%
In some months, I used the cards for a cash advance	5.23%
My account was closed down by the credit card company	1.52%



<b>Which of the following financial transactions have you EVER done?</b>	<b>Sample mean</b>
I opened a checking or debit card account	91.44%
I opened a savings account or bought a CD	80.62%
I invested in mutual funds	38.77%
I invested in individual stocks	34.13%
I bought savings bonds or other bonds	34.85%
I took out a loan for student education	27.03%
I took out an auto loan	63.65%
I took out a home equity loan	30.48%
I got (or refinanced) a mortgage	49.32%
I got a short term “payday” or “salary advance” loan	7.82%
I got a “refund anticipation loan” to accelerate the receipt of my tax payments	4.36%
I got an auto title loan	6.54%
I used a pawn shop	10.72%
I bought goods on a lay-away plan or at a rent-to-own store	19.05%

# Can't just look at one behavior: Conditional probabilities

	Unconditional Probability	CC:None	CC: Balance	CC: Min Pay	CC: Late	CC: OTL	CC: Cash Adv	CC: Closed	CC: PIF	Checking	Savings	Mut. Fund	Stocks	Bonds	Loan: Stu	Loan: Auto	Loan: HE	Loan: Mort	Loan: Payday	Loan: Refund	Loan: Title	Pawn	Lay-A-Way/Rent
CC:None	37%	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.15	0.06	0.06	0.09	0.17	0.14	0.09	0.10	0.40	0.34	0.20	0.44	0.34
CC: Balance	31%	0.00	1.00	0.52	0.64	0.67	0.55	0.21	0.03	0.32	0.34	0.32	0.31	0.36	0.45	0.39	0.35	0.36	0.33	0.27	0.41	0.24	0.38
CC: Minimum Pay	21%	0.00	0.36	1.00	0.63	0.60	0.59	0.22	0.02	0.22	0.21	0.17	0.16	0.16	0.29	0.23	0.21	0.21	0.30	0.31	0.24	0.30	0.32
CC: Late	8%	0.00	0.16	0.23	1.00	0.60	0.25	0.31	0.02	0.08	0.08	0.06	0.06	0.05	0.12	0.08	0.05	0.06	0.12	0.14	0.09	0.08	0.10
CC: OTL	4%	0.00	0.09	0.12	0.35	1.00	0.21	0.27	0.00	0.04	0.05	0.03	0.04	0.04	0.07	0.05	0.03	0.03	0.09	0.08	0.06	0.02	0.04
CC: Cash Advance	31%	0.00	0.09	0.14	0.17	0.25	1.00	0.00	0.01	0.05	0.05	0.03	0.03	0.05	0.05	0.05	0.05	0.03	0.11	0.04	0.05	0.04	0.08
CC: Closed	2%	0.00	0.01	0.02	0.06	0.09	0.00	1.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.02	0.03	0.00	0.03	0.01
CC: PIF	37%	0.00	0.03	0.03	0.08	0.03	0.07	0.05	1.00	0.37	0.40	0.56	0.54	0.49	0.26	0.37	0.44	0.45	0.12	0.14	0.28	0.13	0.16
Checking	91%	0.83	0.96	0.96	0.94	0.93	0.88	1.00	0.92	1.00	0.97	0.97	0.97	0.97	0.96	0.97	0.97	0.97	0.99	1.00	0.98	0.95	0.95
Savings	81%	0.59	0.89	0.81	0.83	0.93	0.78	0.67	0.89	0.85	1.00	0.95	0.96	0.96	0.88	0.90	0.91	0.92	0.82	0.79	0.96	0.74	0.83
Mut. Fund	39%	0.11	0.40	0.31	0.33	0.31	0.24	0.13	0.59	0.41	0.46	1.00	0.77	0.63	0.43	0.47	0.58	0.54	0.25	0.21	0.36	0.24	0.27
Stocks	34%	0.10	0.34	0.26	0.29	0.28	0.19	0.13	0.50	0.36	0.41	0.67	1.00	0.58	0.37	0.42	0.52	0.49	0.26	0.33	0.33	0.30	0.26
Bonds	35%	0.15	0.41	0.26	0.24	0.30	0.31	0.21	0.47	0.37	0.41	0.57	0.60	1.00	0.41	0.45	0.49	0.48	0.25	0.31	0.42	0.21	0.31
Loan: Stu	27%	0.22	0.39	0.37	0.41	0.44	0.28	0.13	0.19	0.28	0.30	0.30	0.30	0.32	1.00	0.34	0.35	0.32	0.36	0.41	0.37	0.28	0.33
Loan: Auto	64%	0.44	0.80	0.71	0.71	0.79	0.59	0.38	0.64	0.68	0.71	0.78	0.78	0.82	0.81	1.00	0.87	0.85	0.75	0.73	0.85	0.62	0.71
Loan: HE	30%	0.13	0.35	0.30	0.24	0.19	0.31	0.05	0.37	0.32	0.34	0.46	0.46	0.43	0.40	0.42	1.00	0.48	0.26	0.29	0.40	0.23	0.25
Loan: Mort	49%	0.24	0.58	0.49	0.38	0.32	0.31	0.19	0.60	0.53	0.56	0.69	0.71	0.67	0.58	0.66	0.77	1.00	0.44	0.38	0.62	0.38	0.44
Loan: Payday	8%	0.15	0.08	0.11	0.12	0.16	0.16	0.13	0.03	0.08	0.08	0.05	0.06	0.05	0.10	0.09	0.07	0.07	1.00	0.59	0.20	0.37	0.19
Loan: Refund	4%	0.07	0.04	0.06	0.08	0.07	0.03	0.08	0.02	0.05	0.04	0.02	0.04	0.04	0.07	0.05	0.05	0.03	0.33	1.00	0.15	0.22	0.13
Loan: Title	7%	0.06	0.09	0.07	0.07	0.09	0.07	0.00	0.05	0.07	0.08	0.06	0.06	0.08	0.09	0.09	0.09	0.08	0.17	0.22	1.00	0.13	0.14
Pawn	39%	0.23	0.08	0.15	0.12	0.05	0.07	0.21	0.04	0.11	0.10	0.07	0.09	0.06	0.11	0.10	0.08	0.08	0.51	0.53	0.21	1.00	0.30
Lay-A-Way/Rent	19%	0.31	0.23	0.29	0.26	0.17	0.31	0.09	0.08	0.20	0.20	0.13	0.14	0.17	0.23	0.21	0.15	0.17	0.47	0.59	0.41	0.53	1.00

# Must consider full set of related experiences

- **Often research focuses on one financial behavior at a time**
  - E.g., Payday loans or tax refund loans
- **If trying to find out who engages in this behavior or the implications, fail to recognize that it is highly related to other activities.**
  - Prob (Payday loan) is 8% but...
    - *Prob (Payday loan| no credit card) is 15%*
    - *Prob (Payday loan| pay cc bill in full) is 3%*
    - *Prob (Payday loan| cc cash advance) is 16%*
    - *Prob (Payday loan| tax refund loan) is 59%*

# Reducing the dimensionality of experiences

- **Standard method in biology and consumer research: cluster analysis.**
  - Related to factor analysis or principal components analysis
- **Create groups of “similar” members of the population on basis of shared traits.**
  - Searches for common factors
  - Iteratively creates groups
- **We create experience groups using only experience information**
  - Not include demographics or literacy.
  - Rather, then ask whether assignment to experience group is related to demographics and literacy.

# The four segments

Pay in full (27%)	Borrowers/ Savers (12%)	Pay fees (31%)	AFS users (30%)
<ul style="list-style-type: none"><li>- Have credit cards</li><li>- Pay card bill in full (transactors)</li><li>- High levels of trad. borrowing &amp; saving</li><li>- Lowest levels of AFS borrowing</li></ul>	<ul style="list-style-type: none"><li>- Have credit cards</li><li>- Carry balances, Sometimes fees</li><li>- Highest % of trad. borrowing &amp; saving</li><li>-Some AFS Borrowing</li></ul>	<ul style="list-style-type: none"><li>-Have credit cards, but pay mins only.</li><li>-Highest level of credit card fees</li><li>-Low levels of trad saving/investing</li></ul>	<ul style="list-style-type: none"><li>-Less likely to have credit card. If do, pay in full.</li><li>-Low trad. investing -or borrowing</li><li>-Highest AFS borrowing</li></ul>

# Experiences by Segment

	1: Pay in full	2: Borrowers / Savers	3: Pay fees	4: AFS users
CC None	0.000	0.000	0.002	0.680
CC Balance	0.010	0.947	0.600	0.015
CC Minimum	0.010	0.273	0.559	0.008
CC Late	0.019	0.115	0.174	0.009
CC OTL	0.000	0.060	0.118	0.000
CC Advance	0.000	0.015	0.161	0.000
CC Closed	0.005	0.007	0.042	0.000
CC PIF	0.988	0.037	0.036	0.296
<b>Short name</b>				
Checking	0.977	0.991	0.939	0.805
Savings/CD	0.949	0.982	0.797	0.622
Mutual Fund	0.723	0.839	0.156	0.156
Stocks	0.640	0.825	0.119	0.119
Bonds	0.625	0.646	0.226	0.116
Student Loan	0.201	0.462	0.334	0.189
Auto Loan	0.770	0.940	0.657	0.380
Home Equity	0.485	0.538	0.251	0.111
Mortgage	0.798	0.774	0.444	0.166
Payday Loan	0.024	0.084	0.079	0.122
Refund Loan	0.004	0.047	0.049	0.071
Auto Title Loan	0.047	0.118	0.063	0.064
Pawn	0.019	0.135	0.103	0.178
Lay-A-Way/Rent	0.064	0.248	0.228	0.240

# Univariate demographics by experience

	Total Sample	1: Pay in full	2: Borrowers / Savers	3: Pay fees	4: AFS users
Panel A: Demographics	Mean	Mean	Mean	Mean	Mean
Age	47.8	53.1	49.5	45.1	45.4
Female	50.0%	43.5%	37.8%	52.4%	58.0%
White	85.0%	91.1%	87.4%	80.8%	83.1%
Black	6.4%	2.1%	5.2%	10.5%	6.6%
Hispanic	3.6%	1.5%	1.4%	4.9%	5.1%
Household Income:					
Under \$30,000	32.8%	16.7%	10.2%	35.8%	52.9%
\$30,000 to \$49,999	20.4%	20.1%	17.3%	21.1%	21.3%
\$50,000 to \$74,999	18.2%	20.2%	30.8%	17.5%	12.3%
Above \$75,000	28.5%	43.0%	41.7%	25.7%	13.6%
Not employed	13.9%	7.9%	7.0%	12.7%	23.2%
Financial Assets:					
Under \$50,000	58.2%	26.5%	47.9%	76.1%	71.6%
\$50 - \$100,000	13.1%	18.1%	18.9%	9.2%	10.4%
\$100 - \$250,000	11.6%	19.1%	13.4%	9.6%	6.3%
Over \$250,000	17.1%	36.3%	19.8%	5.1%	11.6%

# Debt literacy by experience

Panel B: Debt Literacy	Total Sample	Experience Segments			
		1. Pay in full	2. Borrowers/savers	3. Pay fees	4: AFS users
Question 1 (debt doubling)					
% correct	35.9%	44.7%	46.7%	34.9%	24.9%
% do not know	18.3%	11.7%	10.4%	23.6%	21.7%
Question 2 (min payment)					
% correct	35.4%	42.0%	46.1%	38.2%	22.5%
% do not know	21.7%	17.6%	15.6%	22.8%	26.5%
Question 3 (payment options)					
% correct	6.9%	10.6%	13.5%	3.7%	4.5%
% do not know	9.2%	7.0%	7.2%	9.0%	12.0%
Average self-assessment (1 to 7, excludes na)	4.88	5.48	5.24	4.45	4.62



# The four segments: Multinomial Logits, Demographics and Literacy

Pay in full	Borrowers/ Savers	Pay fees	AFS users
(-) African Am, Large households, Low wealth (+) High income	(-) Hispanic (+) High income	(-) Not employed (+) African Am, Large households, All wealth groups except highest	(-) Higher income (+) Not employed
(+) Higher self-ass. literacy (-) Incorrect or Do not Know		(-) Higher self- assessed literacy	(+) Incorrect or Do not Know (-) Higher self- assessed literacy

# Take-aways:

## Financial experiences

- **Individuals have many financial experiences**
- **Experiences are correlated**
  - For example, individuals draw on many high-cost sources of credit
- **While possible to do more advanced clusters or other analyses, capture different experience groups**
  - The pay in full segment has high income and high financial literacy
  - The pay fees group has lower wealth, and has lower levels of self-reported and actual literacy.
  - The AFS users group is drawn from lower income groups and is characterized by low debt literacy (and acknowledge not knowing debt concepts.)

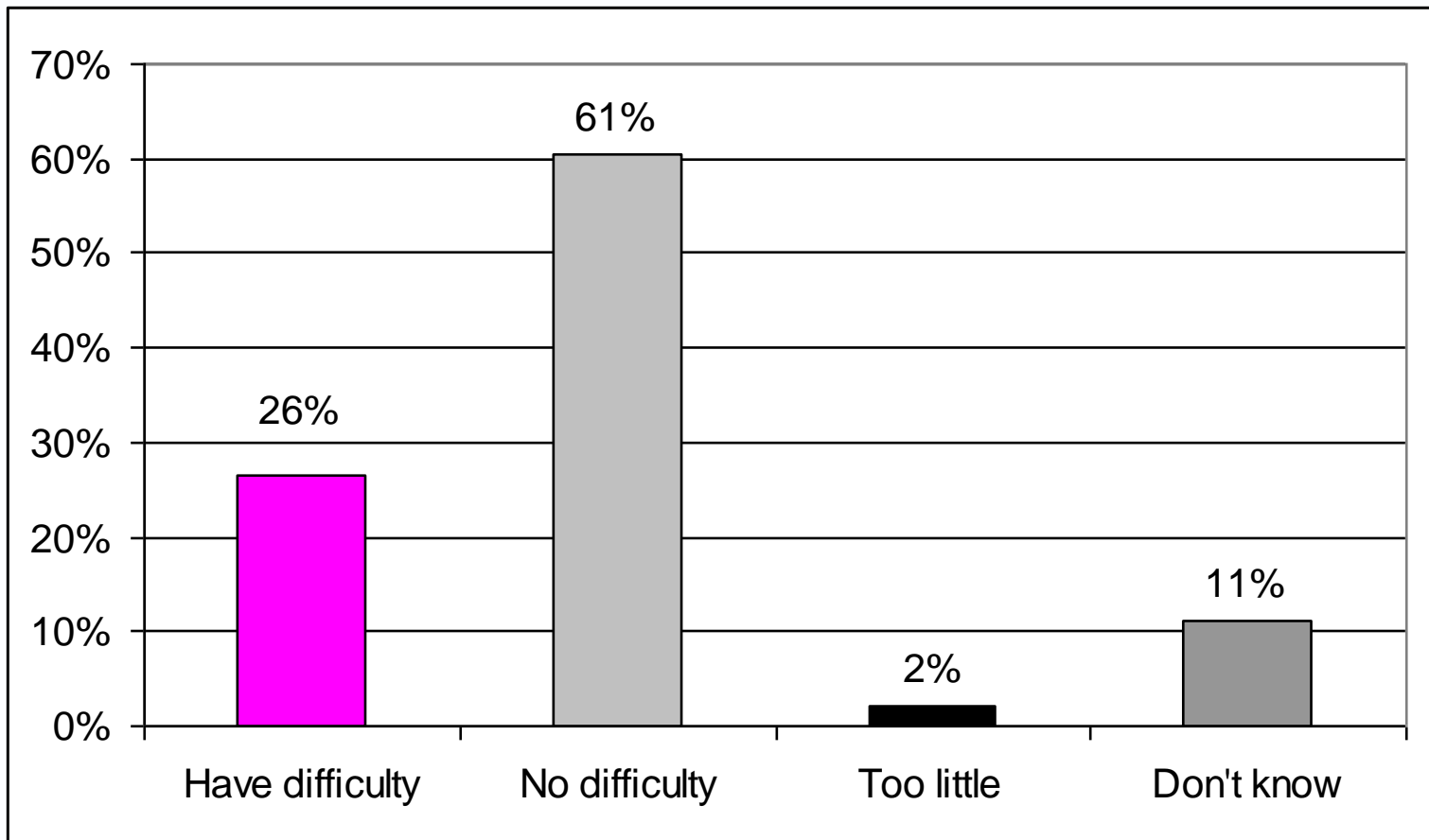
# Indebtedness

- **Outcome measure: Self-assessed debt loads.**

*Which of the following describes your current debt position?*

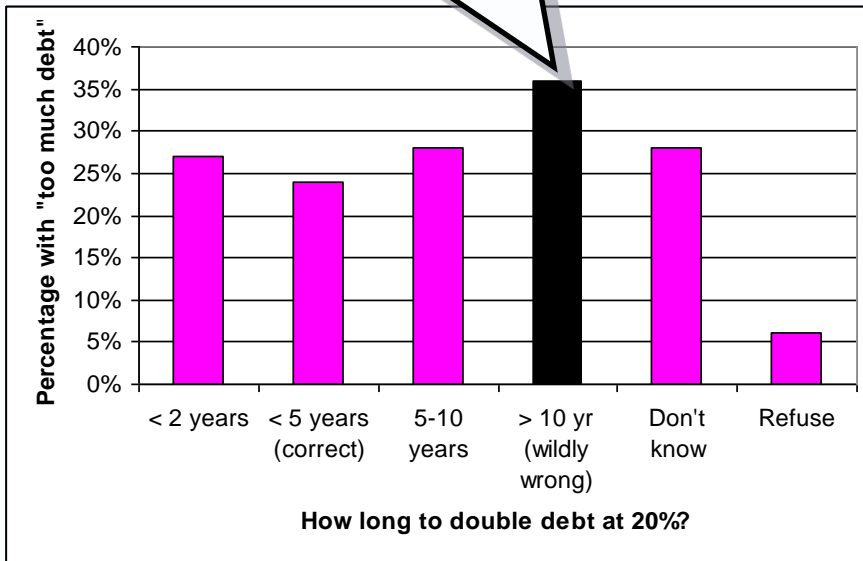
- *I have too much debt right now and have or may have difficulty paying it off*
- *I have about the right amount of debt right now and I face no problems with it*
- *I have too little debt right now and wish I could get more*
- *I just don't know*

# Self-assessed debt loads

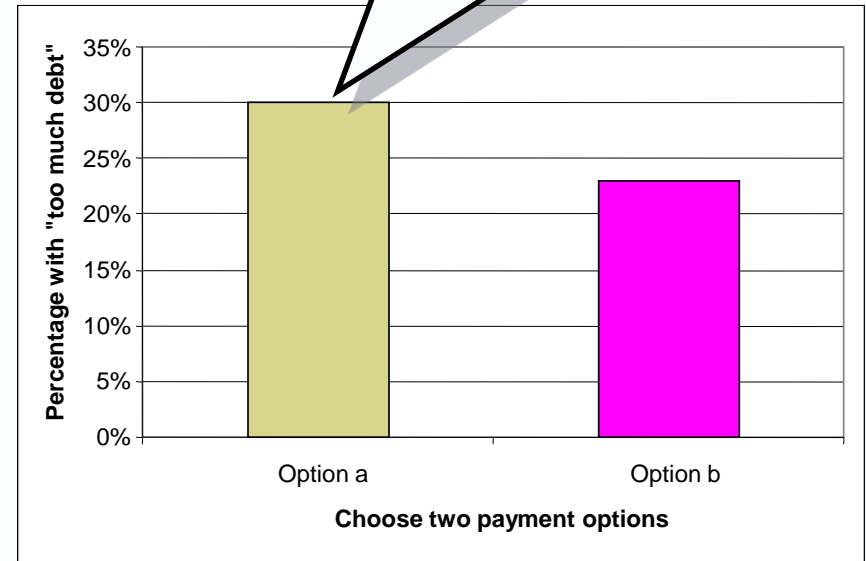


# People who make errors have difficulty paying off debt

Grossly underestimate compounding



Gives free loan to retailer



# Demographics by indebtedness

	Total Sample	Difficulty with debt	Right Amount	Too Little	Don't Know
Panel A: Demographics	Mean	Mean	Mean	Mean	Mean
Age	47.8	44.1	49.8	43.7	46.6
Female	50.0%	48.4%	47.7%	30.7%	69.5%
White	85.0%	84.9%	87.0%	87.9%	74.1%
Black	6.4%	6.9%	4.4%	0.0%	17.9%
Hispanic	3.6%	4.1%	3.4%	6.1%	3.5%
Married	64.0%	62.5%	69.2%	59.6%	40.0%
Single	16.0%	16.1%	12.8%	33.6%	30.3%
Separated	19.9%	21.4%	17.9%	6.9%	29.7%
Household Income:					
Under \$30,000	32.8%	41.0%	24.2%	38.0%	59.3%
\$30,000 to \$49,999	20.4%	21.1%	19.9%	13.7%	23.1%
\$50,000 to \$74,999	18.2%	18.3%	20.4%	15.0%	6.5%
Above \$75,000	28.5%	19.5%	35.5%	33.4%	11.1%
Not employed	13.9%	15.6%	12.4%	17.0%	17.7%
Financial Assets:					
Under \$50,000	58.2%	82.7%	46.5%	30.2%	68.8%
\$50 - \$100,000	13.1%	10.0%	14.5%	8.5%	13.7%
\$100 - \$250,000	11.6%	4.5%	15.8%	26.8%	2.7%
Over \$250,000	17.1%	2.9%	23.2%	34.3%	14.8%

# Financial experiences by indebtedness

	Total Sample	Difficulty with debt	No difficulty	Too little debt	Don't Know
<b>Panel C: Experience Clusters</b>					
1. Pay in full	27.0%	2.6%	38.1%	62.4%	14.4%
2: Borrowers/Savers	12.0%	15.4%	11.7%	0.0%	6.6%
3: Pay fees	31.0%	53.3%	25.1%	0.0%	18.8%
4: AFS users	30.0%	28.7%	25.1%	37.6%	60.2%

# Financial knowledge by indebtedness

	Total Sample	Indebtedness Self-Assessment			
		Difficulty with debt	Right Amount	Too Little	Don't Know
<b>Panel B: Debt Literacy</b>					
Question 1 (debt doubling)					
% correct	35.9%	32.1%	41.7%	30.8%	14.2%
% do not know	18.3%	19.1%	15.5%	37.7%	28.4%
Question 2 (min payment)					
% correct	35.4%	38.2%	38.0%	16.2%	18.0%
% do not know	21.7%	21.6%	19.5%	37.7%	30.9%
Question (payment options)					
% correct	6.9%	6.0%	8.3%	8.1%	1.7%
% do not know	9.2%	8.0%	7.9%	6.1%	19.1%
Average self-assessment (1 to 7, excludes na)	4.88	4.34	5.16	6.17	4.41



# Results from the multinomial logits

## ■ Debt literacy

- Less likely to have difficulty with debt if higher self-assessed financial literacy (greater than 4, monotonic).
- More likely to have difficulty with debt if overestimate the time it takes debt to double
- Less likely to report no difficulty if do not know interest compounding

## ■ Experiences

- Compared to in full payers, fee payers and AFS users are more likely to report having difficulty with debt.
- The borrowers/savers also more likely to report having difficulty with debt

# Cost of ignorance

- **Focus on credit cards**
  - (1) Paying the minimum only, (2) paying card late, (3) going over the limit, (4) use credit card for cash advances
- **We calculate (under conservative assumptions)**
  - Likelihood of behavior that give rise to fees due to low literacy
  - Cost of behavior (use our estimates and industry data)
- **Total cost of fees for these 4 behaviors is \$26.8 billions**
- **The low literacy individuals pay 50% higher fees than the average card holders; 1/3 of their fees are incremental charges linked to low literacy**

# Conclusions

- **Literacy should not be taken for granted**
  - Only 1/3 of population know about interest compounding or the working of credit cards
- **Literacy linked to financial experiences**
  - Financial decisions are interrelated
  - Those with lower literacy tend to engage in high-cost transactions
- **Literacy linked to debt loads**
  - Those with lower literacy are more likely to report having difficulties with debt
- **Cost of ignorance is high: 1/3 of fees and finance charges can be attributed to lack of literacy**