Does Overconfidence Affect Financial Behaviors?

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Research Question

Does overconfidence in financial literacy affect households' financial behaviors?

Evidence from:
- Retirement readiness
- Precautionary savings
- Financial market participation

Data

2012, 2015, and 2018 National Finance Capability Study (NFCS), which covers 80,164 households with sample weights to mimic the national population

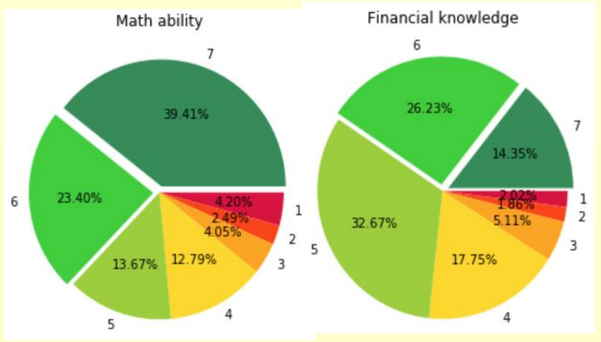
- **Financial behaviors & Demographic characteristics**

T1: Sum. stat. – Financial behaviors & demo. chars.

Variables	10th pct.	Median	90th pct.	Mean	S.D.
Readiness	0	0	1	0.309	0.462
Precaution	0	0	1	0.449	0.497
Participation	0	0	1	0.314	0.464
Female	0	1	1	0.514	0.500
Age	20	50	70	46.34	16.52
Nonwhite	0	0	1	0.350	0.477
Married	0	1	1	0.523	0.499
Income	7500	42500	125000	62054	49232
High School	1	1	1	0.954	0.210
College	0	0	1	0.355	0.479

- **Perceived financial literacy**
  Larger numbers for higher literacy
  Households tend to perceive high levels of financial literacy

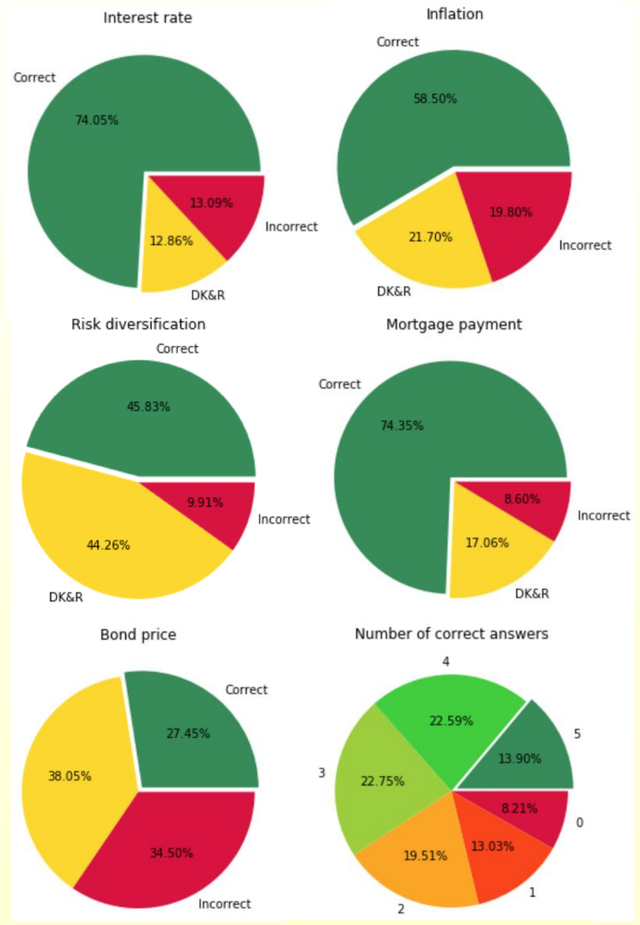
F1: Composition of perceived financial literacy



Data (Con't)

- **True financial literacy**
  No more than 15% households answer all the "Big Five" questions correctly

F2: Composition of true financial literacy

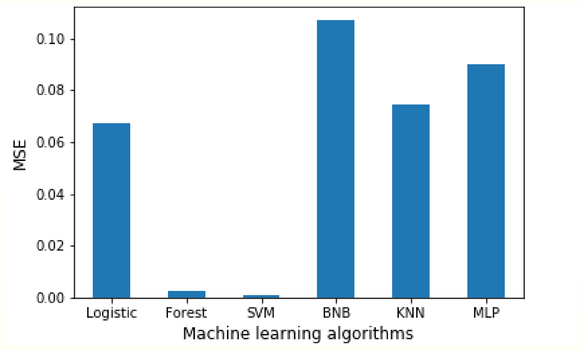


Methods & Results

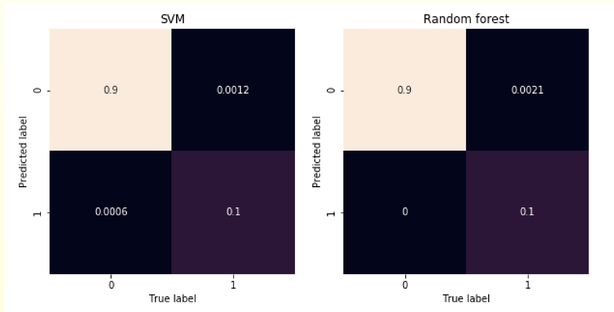
- **Overconfidence measures (ML based)**
  Learning set: Unambiguous overconfident (858) or not overconfident (7,506) households
  Features: Demographic characteristics, perceived & true financial literacy
  Classifiers: Logistic, Random Forest, SVM, Bernoulli NB, KNN, MLP
  Out of sample prediction: Probabilities

Methods & Results (Con't)

F3: MSEs of different classifiers



F4: Confusion matrices: SVM and random forest



- **True financial literacy measure**
  Factor analysis on the "Big Five" questions using principal component method
  Calculate normalized factor scores

T2: Sum. stat. – Overconfidence & True financial literacy

Variables	10th pct.	Median	90th pct.	Mean	S.D.
Overconfidence					
SVM	≈ 0	0.133	≈ 1	0.392	0.426
Forest	0.029	0.203	0.455	0.234	0.170
True literacy	0.214	0.630	1	0.580	0.299

- **The effect of overconfidence**
  Dependent variables: Financial behaviors
  Independent variables: Overconfidence, True literacy, Demographic characteristics, Year dummies, State dummies
  Logit regression

$$\Pr(y_{it} = 1 | \mathbf{X_{it}}, \beta_0, \beta_1, \varepsilon_{it}) = F(\beta_0 + \mathbf{X_{it}}\beta_1 + \boldsymbol{\varepsilon_{it}})$$

where $F(x) = e^x/(1+e^x)$

Methods & Results (Con't)

T3: Overconfidence and retirement readiness

Dept. Var.: Readiness	(1) SVM	(2) Forest
Overconfidence	0.147***	0.455***
	(0.00637)	(0.0246)
True literacy	0.339***	0.420***
	(0.00993)	(0.0147)

T4: Overconfidence and precautionary savings

Dept. Var.: Precaution	(1) SVM	(2) Forest
Overconfidence	0.164***	0.466***
	(0.00656)	(0.0268)
True literacy	0.319***	0.388***
	(0.0101)	(0.0155)

T5: Overconfidence and financial mkt. participation

Dept. Var.: Participation	(1) SVM	(2) Forest
Overconfidence	0.148***	0.470***
	(0.00647)	(0.0240)
True literacy	0.375***	0.459***
	(0.0102)	(0.0147)

Conclusion

Overconfidence in financial literacy has a decent effect on financial behaviors of households with similar true literacy

Overconfidence ↑ by 1 std. div. :
- Pr(readiness) ↑ by **6.3% - 7.7%**
- Pr(precaution) ↑ by **7.0% - 7.9%**
- Pr(participation) ↑ by **6.4% - 8.0%**

Limitations

- Unbalanced overconfidence classification
- Fail to check heterogeneous effects

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