Millennials and credit: use, data sharing and financial literacy

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Outline

- Motivation and objectives
- Project - *Psychology of student credit: pre-testing the data collection*
- Preliminary exploratory results
- Acknowledgments
  - Many thanks to Challenge Investment Fund of UoE AHSS College for funding this research
  - Many thanks to Callcredit (in particular, Jonathan Gill and Andy Peloe) for collaboration and the permission to use Noddle credit reports.

Motivation

- Young people are high risk and ‘thin credit file’ borrowers
- At the same time younger generation or millennials have a substantial ‘digital print’ – lots of data that may or may not be related to credit performance
- There is a question not only what kind of data is predictive, but also what will be ethical to use for augmenting thin credit file
- Personality is one of non-traditional types of data that may be useful for thin file augmentation.
- Seems plausible that personality is at least partially responsible for credit repayment behaviour
- Traditionally ‘Character’ has been considered an important aspect in credit risk management.

Project

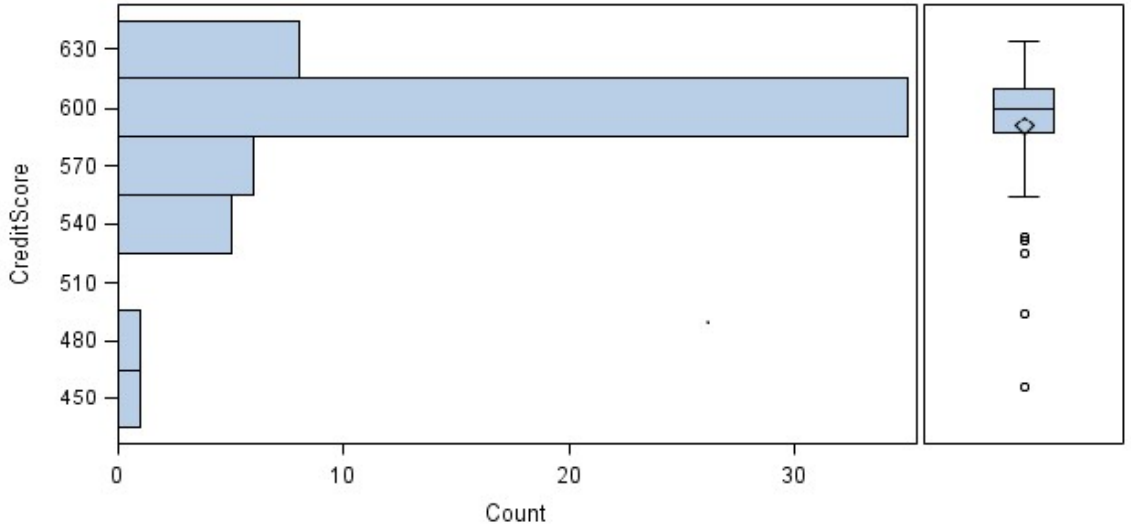
- Attempt to link credit data with personality measures for students and a wider range of young people
- Designed as a pre-test for different ways to collect the data via on-line survey
- Several datasets with different types of information:
  - 65 credit reports from UoE students (mainly Business and Psychology)
  - 409 personality profiles of UoE students on Big 5 dimensions (Conscientiousness, Extraversion, Agreeableness, Neuroticism, Openness) with facets (e.g. Trust, Altruism, Modesty)
    - In addition for subsets of 409 – Locus of Control, Financial Knowledge, Data Sharing.
  - 559 on-line responses from Qualtrics respondent pool on self-reported credit use + Big 5, Financial Knowledge, Financial Confidence, Data Sharing.

Credit reports - collection

- Asked the students to obtain their credit reports and pass them for research
- An informed consent from each student
- A permission from the Callcredit credit bureau
- All reports were anonymised before processing
- Need some trust / association between researchers and respondents because of highly sensitive data
- Very difficult and time-consuming, perhaps, not feasible for a large-scale project with the objective to generalise
- But suitable for pre-tests, small-scale qualitative or experimental research.

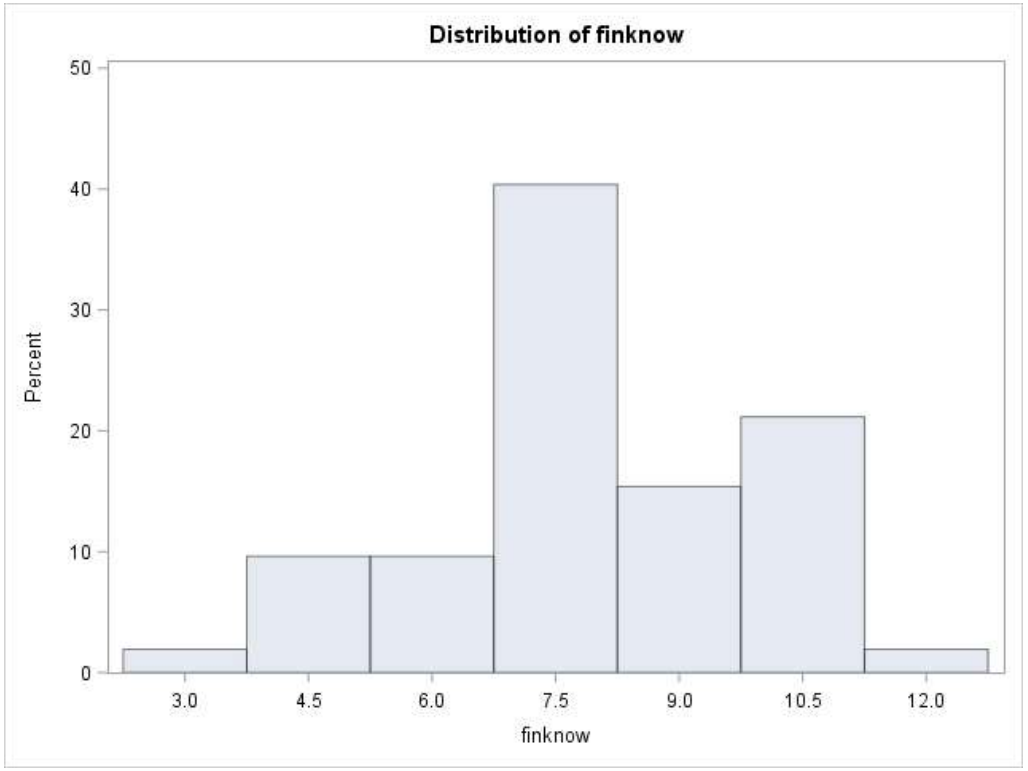
Credit reports

- The majority are ‘thin files’ (as expected), but some already have substantial (and not necessarily good) history
- Some have a lot of searches – shop around, not realising that this may have an affect on their score
- Only exploratory analysis possible because of the sample size.



Financial Knowledge

- The level of knowledge about consumer credit management is disappointing
- A scale of 12 items from Perry (2008) about factors affecting interest rates, credit scores and general investment.



Financial Knowledge Examples

The level of knowledge about consumer credit management is lower as compared to general financial knowledge.

Do you agree with the following statements?

People will be financially better off if the cost of living increases by more than income.

(Yes/No)

	Frequency	Percent
Incorrect	5	2.76
Correct	176	97.24

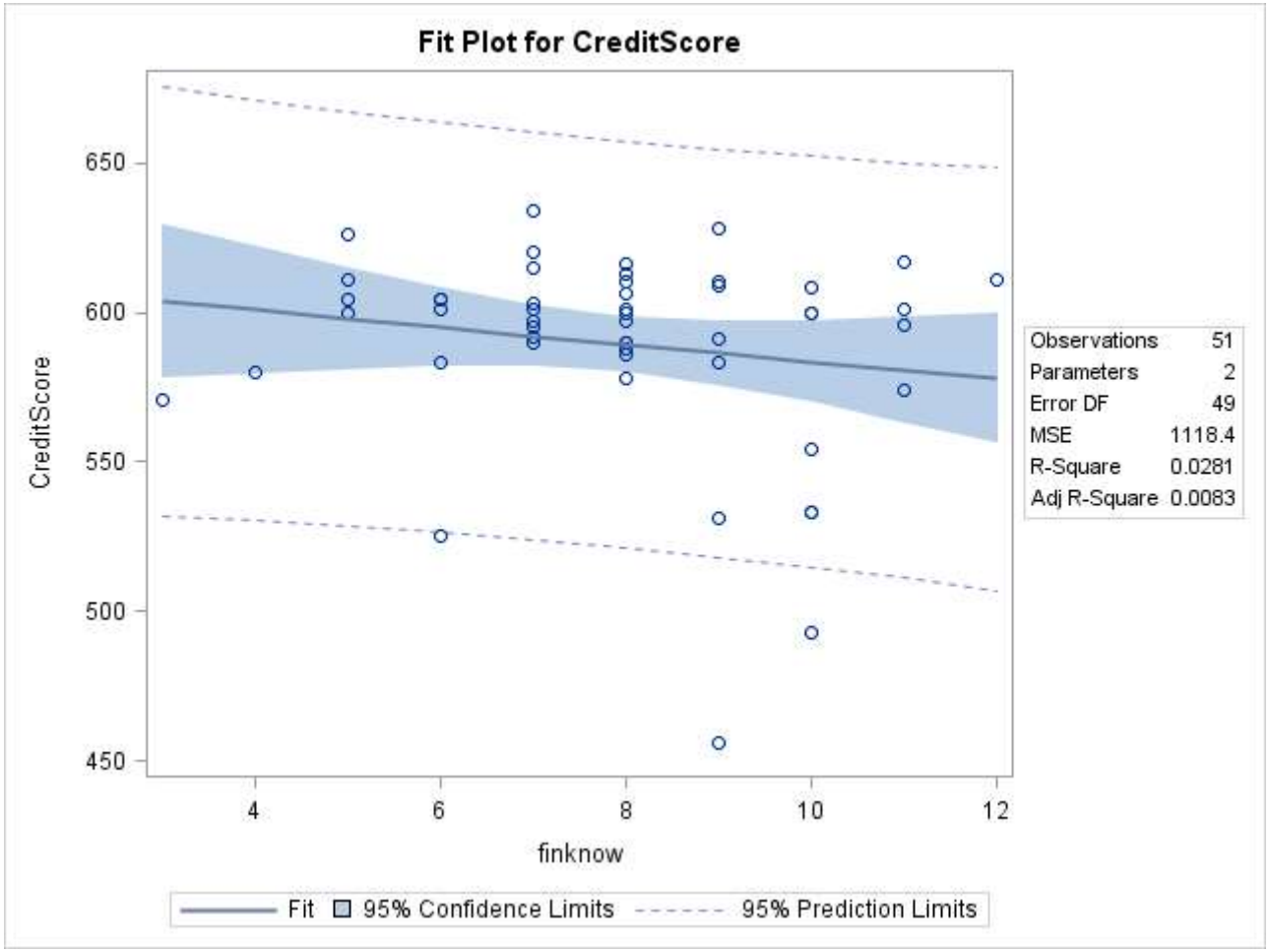
What will be the impact on a person's credit score if they. . . ?
... have a good payment record and apply for many new credit cards.

(Worse, No Impact, Improve)

	Frequency	Percent
Incorrect	157	86.74
Correct	24	13.26

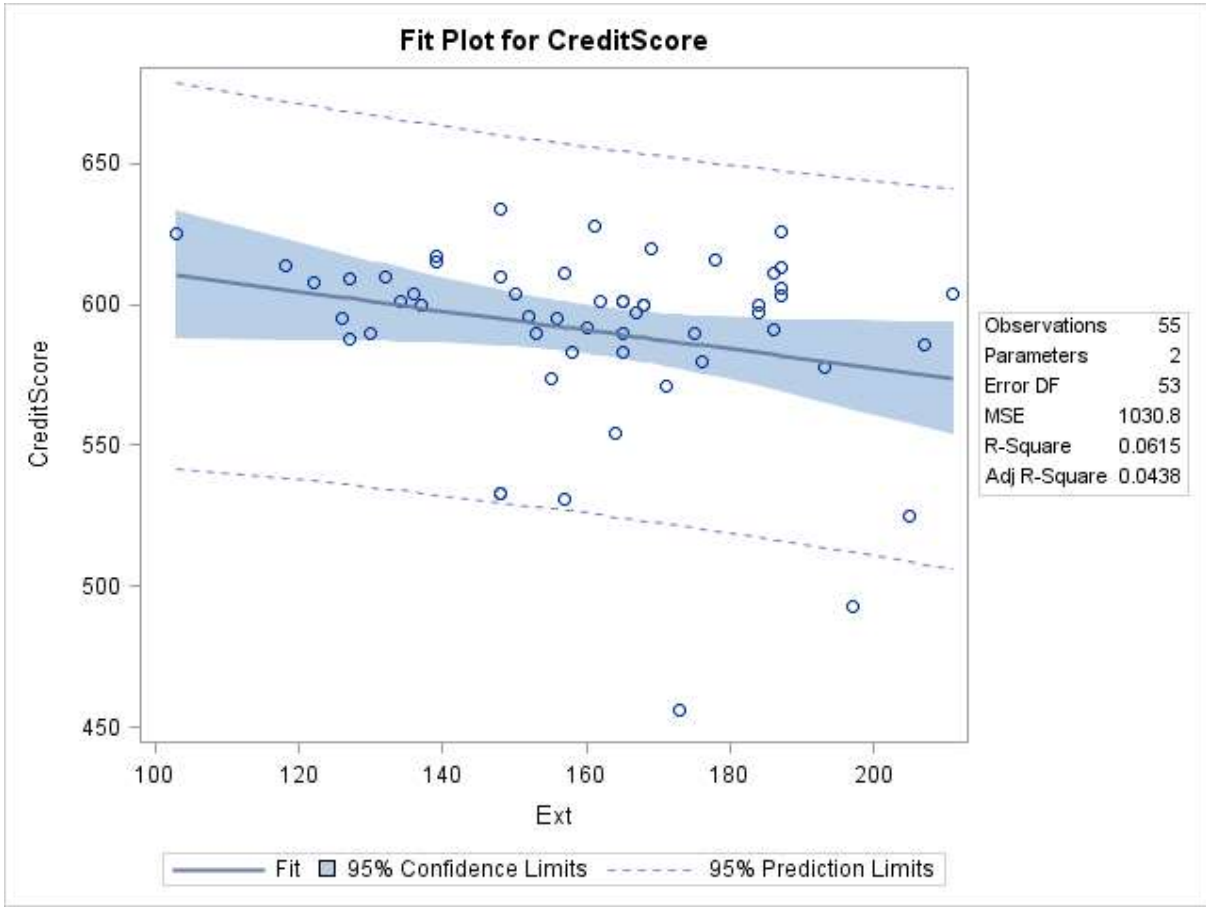
Credit Score v Fin Score

- Outliers, reversed causality: poor credit history leads to better knowledge, i.e. learning from experience



Credit Score v Extraversion

From personality traits, only Extraversion shows some connection.
Higher Ext-n means lower Score - too much partying?



of missed payments

- Zero-inflated Poisson regression

	Estimate	Std. Error	z value	Pr(>|z|)
Intercept	-29.82	33.38	-0.89	0.37
Fin Know	0.63	0.78	0.81	0.42
Agreeableness	**0.14**	**0.062**	**2.28**	**.022 ***
Extraversion	-0.018	0.012	-1.48	0.14
Conscientiousness	0.01	0.11	0.096	0.92
Neuroticism	**-0.068**	**0.037**	**-1.86**	**.064 .**
Openness	0.061	0.048	1.27	0.2
Locus of Control	0.26	0.52	0.51	0.61

of searches

- Zero-inflated Poisson regression

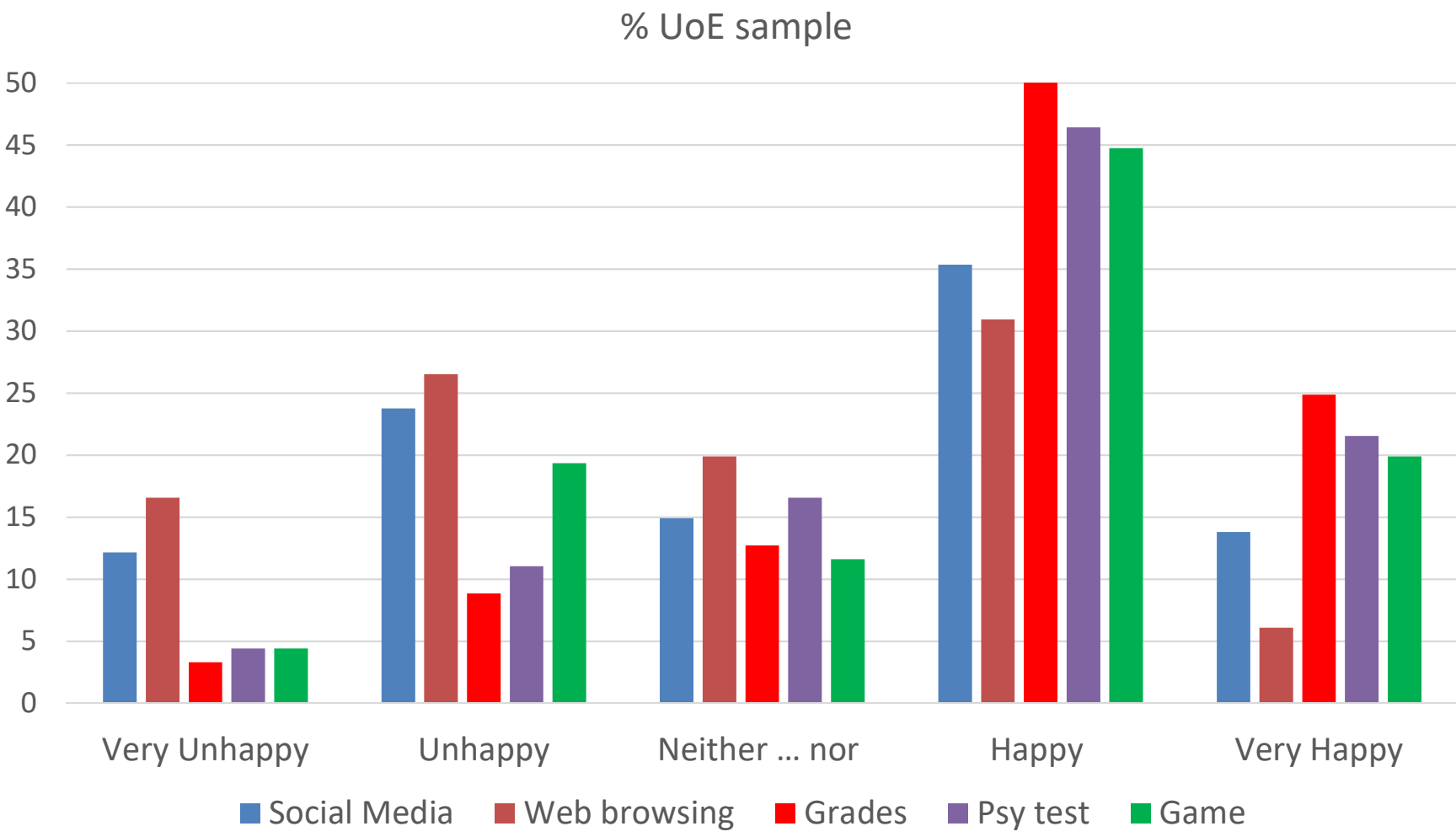
	Estimate	Std. Error	z value	Pr(>|z|)	
Intercept	-7.57	1.71	-4.42	<.0001	***
Fin Know	0.22	0.033	6.65	<.0001	***
Agreeableness	-0.012	0.0032	-3.68	.00024	***
Extraversion	0.026	0.0041	6.44	<.0001	***
Conscientiousness	0.023	0.005	4.53	<.0001	***
Neuroticism	0.0042	0.0035	1.21		0.22
Openness	-0.0016	0.0031	-0.51		0.61
Locus of Control	0.097	0.024	4.06	<.0001	***

Data sharing - Question

"…Which of the following information you will be happy to provide:

- Your social media data, such as your Facebook account
- Your on-line browsing behaviour and browsing history limited to relevant websites, such as financial services or price comparison websites
- Your university grades/marks
- The results of the personality test consisting of series of questions about different types of behaviour
- You will be asked to perform some task, e. g. play a game and your behaviour will be recorded."

Data sharing – Distribution



Data sharing – Regression

Data Sharing Score – higher values mean higher willingness to share the data

OLS regression of Data Share on Big Five + Locus of Control

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Variance Inflation
Intercept	1	19.88256	5.11124	3.89	0.0001	0
Agreeableness	1	-0.00921	0.01368	-0.67	0.5018	1.09238
Extraversion	**1**	**0.03649**	**0.01630**	**2.24**	**0.0265**	**1.35963**
Openness	1	-0.01148	0.01798	-0.64	0.5239	1.29225
Conscientiousness	1	-0.00609	0.01456	-0.42	0.6763	1.29041
Neuroticism	**1**	**-0.03167**	**0.01435**	**-2.21**	**0.0286**	**1.35553**
Locus of Control	1	0.01511	0.09079	0.17	0.8680	1.81193

Data sharing – Other suggestions

If you can think of any other information that you will be happy to share with a lender please write it down in the box below:

Details of savings and investments
Family finances, references from individuals, previous work history (LinkedIn)
Full details of all bank accounts/credit requests
Information on socio-economic background
Receipts to landlords, other regular payments that do not show up on a credit report
Recent Bank Statements/Receipts for Transactions
Wages from part-time work
Being asked to work in part of a group
Health history
Online shopping statements
Purchase records on games
The kind of app you are going to be on

Qualtrics respondents

- Anonymous responses, so could only obtain self-reported credit behaviour.
- Asked for a number of missed payments on credit cards/loans within the last 12 months and a number of (un)authorised overdraft uses.
- Replaced Locus of Control with Financial Self-Efficacy Scale (FSES) by Lown, J.M. (2011), and used a shorter version of Big 5.

E.g. In the last 12 months how many times did you miss a monthly payment on your credit card (when you have to pay a penalty)?

	Frequency	Percent
Never	239	65.48
Once	56	15.34
Twice	44	12.05
Three times	17	4.66
Four or more	9	2.47

Missed payments for all products

Zero-inflated Poisson

	Estimate	Std. Error	z value	Pr(>|z|)
Intercept	1.96	0.58	3.4	.00068 ***
Fin Know	-0.1	0.02	-5.08	<.0001 ***
Perceived FinKnow	0.013	0.019	0.67	0.5
Agreeableness	-0.0071	0.0095	-0.74	0.46
Extraversion	0.007	0.009	0.78	0.44
Conscientiousness	-0.0032	0.01	-0.31	0.76
Neuroticism	0.017	0.0092	1.83	.067 .
Openness	0.014	0.0093	1.5	0.13
FSES	-0.12	0.015	-8.16	<.0001 ***

Data Share

OLS regression on Data Share

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Variance Inflation
Intercept	1	14.50982	2.20730	6.57	<.0001	0
FSES	1	-0.06481	0.05089	-1.27	0.2034	1.15486
FinKnow	**1**	**-0.45787**	**0.18382**	**-2.49**	**0.0130**	**1.09555**
Perceived FinKnow	**1**	**0.62031**	**0.18498**	**3.35**	**0.0009**	**1.10954**
Extraversion	**1**	**0.07683**	**0.03431**	**2.24**	**0.0256**	**1.29952**
Agreeableness	**1**	**0.07234**	**0.03724**	**1.94**	**0.0526**	**1.37952**
Conscientiousness	1	-0.02494	0.04048	-0.62	0.5381	1.63498
Neuroticism	1	0.00634	0.03527	0.18	0.8575	1.52309
Openness	1	-0.02250	0.03500	-0.64	0.5206	1.23859

Further work

- Add academic performance for a subset of respondents who agreed to share it for research; analyse its relationship with credit history and fin knowledge;
- Explore relationship between credit use and Psychometrics; and components of credit history, e.g. changes in balance and Psychometrics;
- Explore the effect of ‘time’ – response duration for the survey and its parts;
- Investigate non-linear, non-parametric and Bayesian models;
- Continue with the data collection (subject to funding).

Any advice, comments and offers of collaboration (esp. from lenders!) are appreciated!