National Bank of Ukraine

The Role of Financial Literacy in Anchoring Inflation Expectations:
The Case of Ukraine

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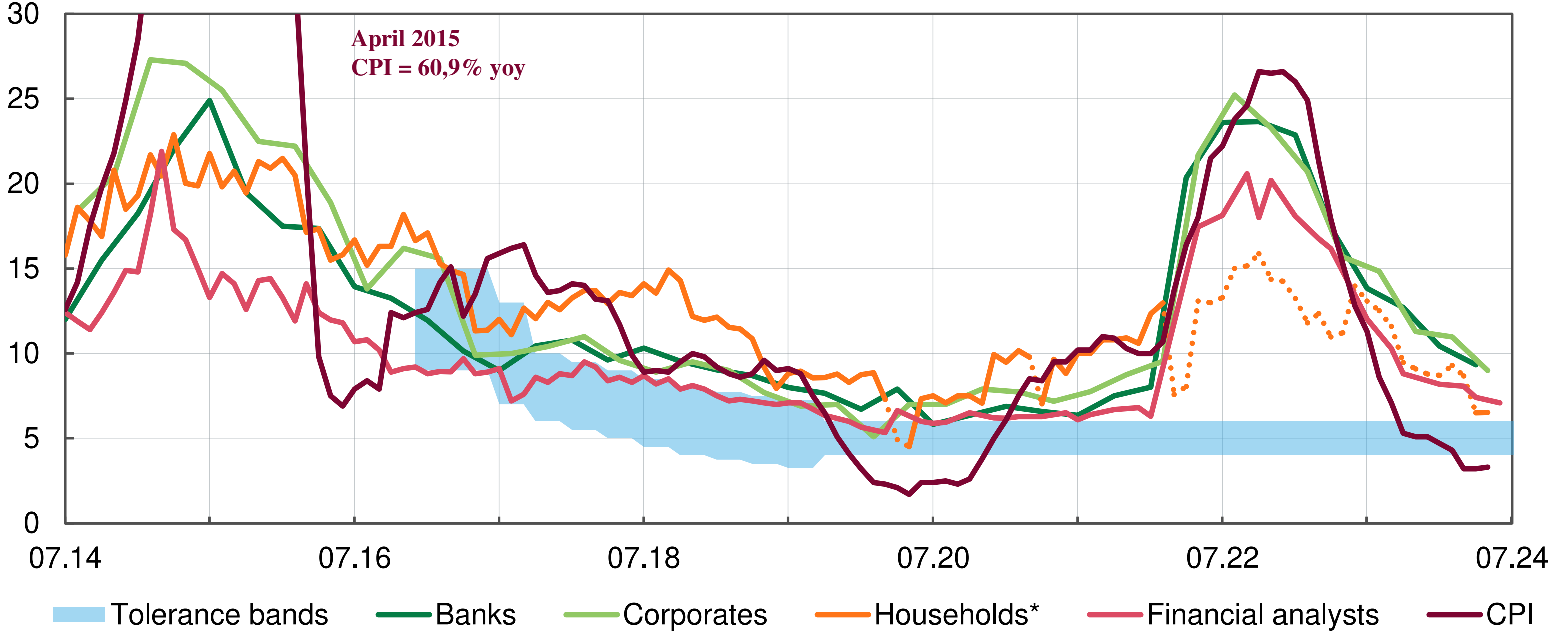
Why inflation expectations matter

- Inflation expectations (IE) of households and firms about future price changes affect economic processes today
  - IE influence households' current decisions about whether to consume or to save, affecting aggregate consumer demand in the economy
  - IE create a demand for wages in the labor market that take into account expected inflation, so as to maintain the purchasing power of incomes
  - Businesses set current prices for goods and services, taking into account such demand, the desired level of employee wages, and their own expectations regarding factor productivity costs in the future
- Anchored inflation expectations allow central banks to achieve their inflation targets more effectively
  - In case of inflationary shocks from supply side, central banks can conduct less aggressive policy to curb inflation
  - With deflationary shocks from demand side, policy easing by central banks is more effective, and the risk of reaching the zero lower bound of the interest rate decreases

Evolution of inflation expectations in Ukraine

CPI, NBU's inflation target, and inflation expectations for next 12 months, %



* Dotted lines – change of the survey method from face-to-face to the phone interviews.

Source: NBU, GfK Ukraine, Info Sapiens.

What we know about expectations in Ukraine

- Inflation expectations are largely adaptive and depend on FX changes, which remained a nominal anchor for a long time under the fixed exchange rate policy (Coibion & Gorodnichenko, 2015; Zholud et al., 2019)
- Respond to news on price changes of specific goods and services, e.g., food, fuel, utilities (Yukhymenko, 2022)
- The stronger the trust in the NBU, the closer inflation expectations are to their target (Savolchuk & Yukhymenko, 2023)
- Central banks' active communications help anchor inflation expectations (Yukhymenko & Sorochan, 2024)

Motivation

- To anchor inflation expectation and ensure price stability central banks
  - Improve credibility and trust by transparent and consistent policy (Blinder, 2000)
  - Actively communicate and explain policy decisions

- Communication policy of central banks is found to be quite successful and improves inflation expectations anchoring of professional forecasters and experts (Luis de Guindos at the Annual Congress of EEA, 2019)

- **How about potentially less literate categories of economic agents (households)?**
  - Households' inflation expectations are explained by specific economic or financial knowledge rather than by general educational attainments or income (van der Cruijsen et al., 2021)
  - Financial literacy yields better investment as more financially literate people earn higher risk-adjusted returns on their investments (Clark et al., 2017)
  - Recent works on financial literacy and inflation in both the US and Europe draw attention to the potential of financial literacy to restrain inflation expectations and hence affect prices (Rumler and Valderrama, 2020; Yakoboski et al., 2023; Beckmann and Kiesl-Reiter, 2023; Coibion et al., 2022)

What we do

This paper examines whether or not financial literacy influences households' expectations about future prices and whether or not it anchors inflation expectations to the central bank's target

- We utilize the novel survey data on financial literacy and inflation expectations of households in Ukraine (USAID, 2021)

- We assess whether
  - the relationship between financial literacy and inflation suffer from reverse causality or endogeneity caused by potential measurement error or unobserved variable bias (IV)
  - asymmetric information in an emerging market distorts inflation perceptions and prevent economic agents from making accurate forecasts (Quantile regressions)
  - individual trust in banking institutions contribute to reducing inflation perceptions and expectations

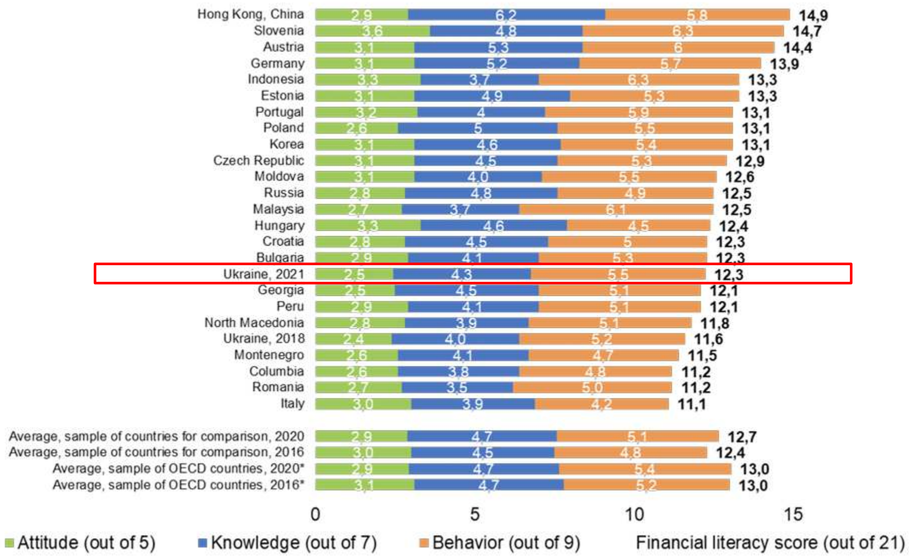
What we found

- We have found that higher financial literacy lowers average uncertainty about one-year inflation, but increases three-year inflation expectations
- The results from quantile regressions confirm the asymmetric effects of financial literacy and its components on inflation
- Inverse effects of financial literacy on expected inflation are at work for the upper end of the distribution (unanchored expectations), while positive effects are seen in the lower end of the distribution (anchored expectations)
- Our findings also suggest that financial literacy significantly improves inflation perceptions and the accuracy of individuals' predictions about inflation
- Trust in the banking sector also is found to lower average inflation expectations

Financial literacy survey

- Survey of financial literacy and financial inclusion in Ukraine (OECD methodology, USAID Financial Sector Transformation Project in cooperation with the NBU, August 2021)
- Nationwide statistically representative
  - 2,040 respondents aged 18-79 across Ukrainian regions (excluding temporary occupied and annexed territories)
- Financial literacy score (max 21)
  - Financial knowledge
  - Financial behavior
  - Financial attitude
- Also covers financial inclusion, resilience, well-being

Financial literacy score: comparison with other countries

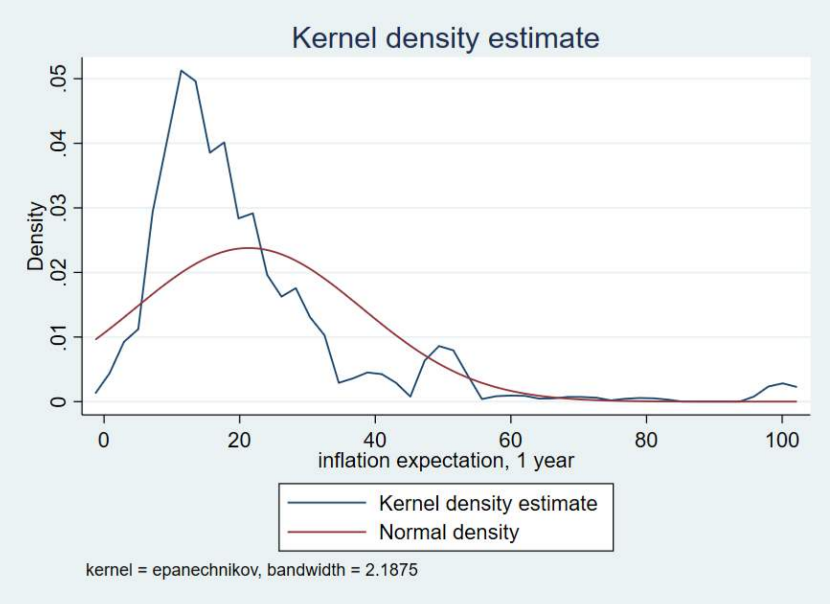


Additional questions on NBU’s request

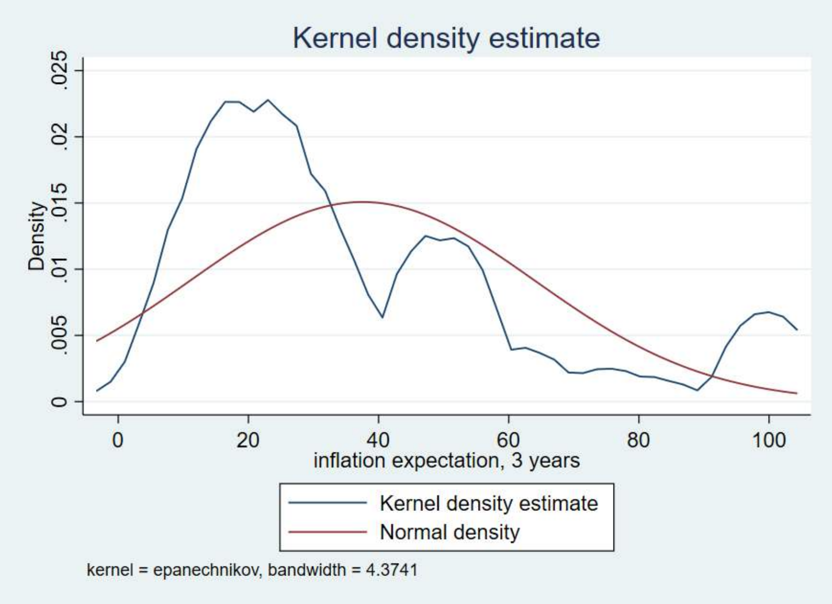
- How much do you think the prices of consumer goods and services have changed over **the past 12 months**?
  - Inflation perception
- How do you think the prices of consumer goods and services will change in **the next 12 months**?
  - Short-run inflation expectation
- How, in your opinion, will the prices of consumer goods and services change in **the next 3 years**?
  - Medium-run inflation expectation

Distributions of inflation expectations

One-year ahead inflation expectations



Three-year ahead inflation expectations



Estimation strategy

- **Dependent variables**
  - Perceptions about current inflation
  - One-year ahead expected inflation
  - Deviation of expected inflation from the consensus forecast in one year
  - Three-year ahead expected inflation
- **Set of complementary methods**
  - OLS + log-transformation + Tobit
  - IV to address endogeneity concerns
    - fraud resistance and gained investment experience to instrument financial literacy (correlate with financial literacy but are unlikely to have any direct effect on inflation expectations)
  - Quantile regressions to account for asymmetry in the distribution of inflation expectations
    - **Lower percentiles** (the lower end of inflation expectation distributions) produce values that are close to the central bank's target and are, therefore, considered to be values with anchored inflation expectations.
    - **Upper percentiles** produce exorbitant values and, thus, are treated as a sample with unanchored expectations.
- **Controls:** trust in financial institutions, income, age, sex, and place of residence (region, metropolis, rural)

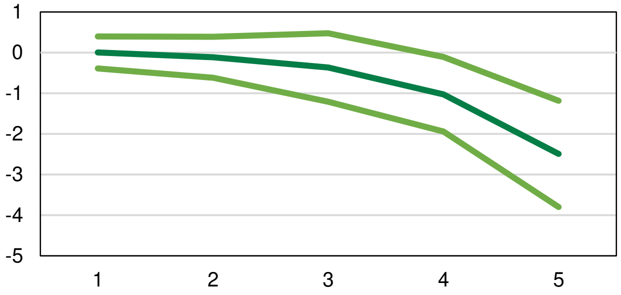
Results from OLS and IV

	OLS				IV			
	Inflation Perception	1-year IE	Forecast deviation	3-year IE	Inflation Perception	1-year IE	Forecast deviation	3-year IE
Financial literacy	-0.2013	0.0410	-0.0009	0.9276***	-0.0327**	-0.0327**	-0.0508**	0.0373**
	(0.138)	(0.146)	(0.143)	(0.222)	(0.015)	(0.015)	(0.025)	(0.017)
Trust	-0.4185**	-0.6334***	-0.5905***	-1.5571***	-0.0223***	-0.0223***	-0.0240**	-0.0391***
	(0.210)	(0.194)	(0.190)	(0.277)	(0.008)	(0.008)	(0.012)	(0.008)
Income	-0.0297	0.0305	0.0347	-0.0671	0.0015	0.0015	0.0031	-0.0029
	(0.061)	(0.067)	(0.065)	(0.088)	(0.003)	(0.003)	(0.004)	(0.003)
Age	0.4366***	0.3225**	0.2969**	0.4073*	0.0202***	0.0202***	0.0289***	0.0088
	(0.147)	(0.139)	(0.135)	(0.221)	(0.006)	(0.006)	(0.010)	(0.007)
Age^2	-0.0046***	-0.0030**	-0.0028*	-0.0035	-0.0002***	-0.0002***	-0.0003***	-0.0001
	(0.002)	(0.002)	(0.001)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
Male	-1.0910	-0.4426	-0.5390	-0.5820	-0.0177	-0.0177	-0.0347	-0.0040
	(0.737)	(0.736)	(0.719)	(1.158)	(0.031)	(0.031)	(0.047)	(0.032)
Metropolis	-5.5831***	-4.8868***	-4.7674***	-8.3214***	-0.1887***	-0.1887***	-0.3160***	-0.2068***
	(1.066)	(1.035)	(1.013)	(1.616)	(0.041)	(0.041)	(0.065)	(0.043)
Rural area	-2.5575***	0.8821	0.7598	-0.3483	0.0506	0.0506	0.0826	-0.0168
	(0.988)	(0.972)	(0.952)	(1.498)	(0.037)	(0.037)	(0.056)	(0.039)
Regional dummies	+	+	+	+	+	+	+	+
F	12.843	8.724	8.383	13.119	10.623	10.623	10.619	10.741
N	1,962	1,951	1,956	1,940	1,951	1,951	1,956	1,940
R^2	0.118	0.064	0.061	0.089			0.050	0.077
Kleibergen-Paap Wald rk F					72.09***	72.09***	72.19***	70.05***
Hansen Jp					0.586	0.586	0.626	0.325
Hausman χ^2					6.435**	6.435**	4.900**	0.269

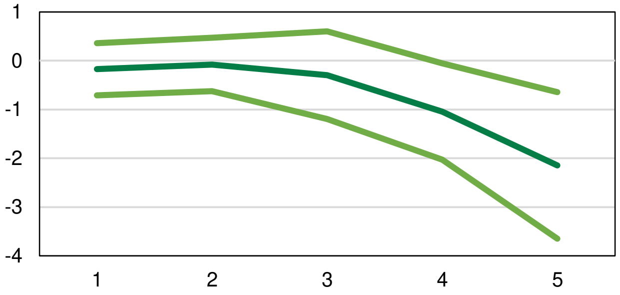
Results from quantile regressions (1)

Estimated coefficients for FINANCIAL LITERACY for different levels of anchoring of expectations (1 – anchored, 5 – unanchored), +/- 2 SD

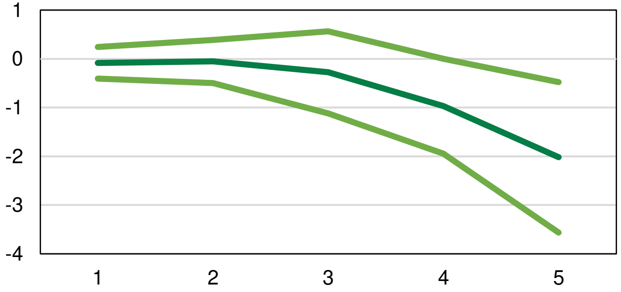
Perceptions about current inflation



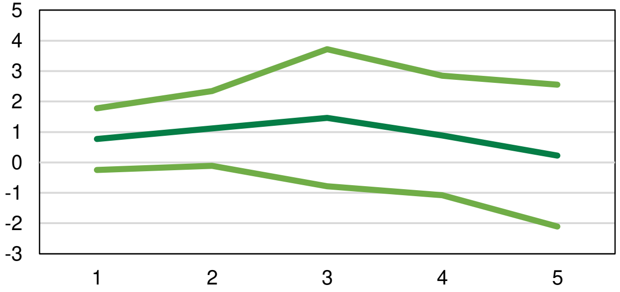
One-year ahead inflation expectations



Deviation from the consensus forecast



Three-year ahead inflation expectations



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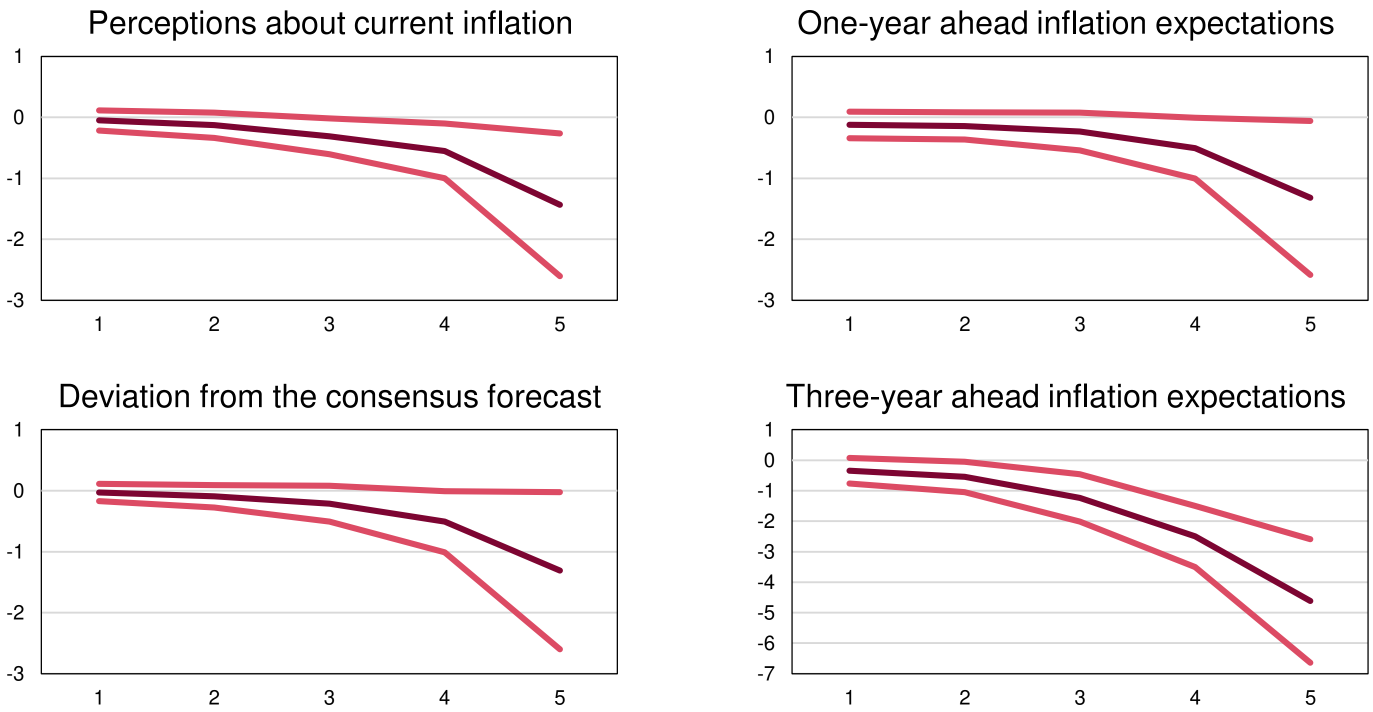
Results from quantile regressions (2)

Estimated coefficients for TRUST for different levels of anchoring of expectations (1 – anchored, 5 – unanchored), +/- 2 SD



Conclusions

- Higher financial literacy lowers average uncertainty about one-year inflation, but increases three-year inflation expectations
- This study provides evidence of the asymmetric effects of financial literacy and its components on inflation
- Inverse effects of financial literacy on expected inflation are at work for unanchored expectations, while positive effects are seen for anchored expectations
- Financial literacy significantly improves inflation perceptions and the accuracy of individuals’ predictions about inflation
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Instrument Constructions

- **1. Individual risk aversion** is constructed as the highest attained educational level minus the number of cases when a respondent became the victim of financial fraud. To obtain the number of fraud cases we use answers to the following survey question:
  Question: Have you had any of the listed problems with financial products over the last two years?
  - (You) invested in a financial product that later turned out to be a fraud, a financial pyramid, etc.
  - (You) provided financial information in response to an email or phone call that later turned out to be fraudulent
  - (You) discovered that someone had used your bank card to pay without your permission
  - (You) requested information about a transaction that you did not make, but that was listed on your bank or credit card statement
  - (You) filed an official complaint about the service of a bank or other financial institution
  - (You) could not open a bank account and the bank did not inform you about the reasons for the refusal
  - You were denied an insurance payment that you were hoping for
  - (You) complained about high fees for transferring or receiving money
  - (You) lost money due to hackers or fraud
- **2. Investment experience** is constructed based on the following survey question:
  Question: Have you (personally) saved any money in the last 12 months using any of the methods listed on this card, regardless of whether or not you had any savings? Please do not include any money saved as a result of recalculations by the Pension Fund, but think about all kinds of savings, say, savings for a rainy day or saving up for a special occasion.
  - Saved and kept cash at home or in my wallet
  - Kept money in a current account or a demand deposit account (available upon request)
  - Gave money to a family member to save/save on your behalf
  - I bought bonds or put them on a time deposit
  - Invested in cryptoassets, cryptocurrencies, etc.
  - Invested in shares
  - Saved or invested in any other way, with the exception of pension contributions (invested in the purchase of livestock, gold, property, etc.)

Financial literacy survey

Overall financial literacy score of Ukraine equals 12.3 points (58% of its maximum value) showing good trends – all components of the indicator have improved - increase by about 6.0% in less than 3 years.

- Approximately 30% of the sample live in the countryside and about 30% reside in big cities.
- The average respondent is 45 years old,
- earns circa UAH 6,600, and tends to save about 9% of their income,
- only 10% of the sample trust the banking system.

Anchored expectations (below the 25th percentile) vs **UnAnchored expectations** (over (the 75th percentile):

- Individuals with lower inflation expectations (likely to have anchored expectations)
- have a higher monthly income (UAH 7,781 vs UAH 6,080),
- are more prone to avoid risk,
- have more investment experience despite being considerably younger (42 vs 47 years old on average).
- are better educated and demonstrate higher financial literacy!