

NBU's Credibility in the Formation of Firm's Inflation Expectations

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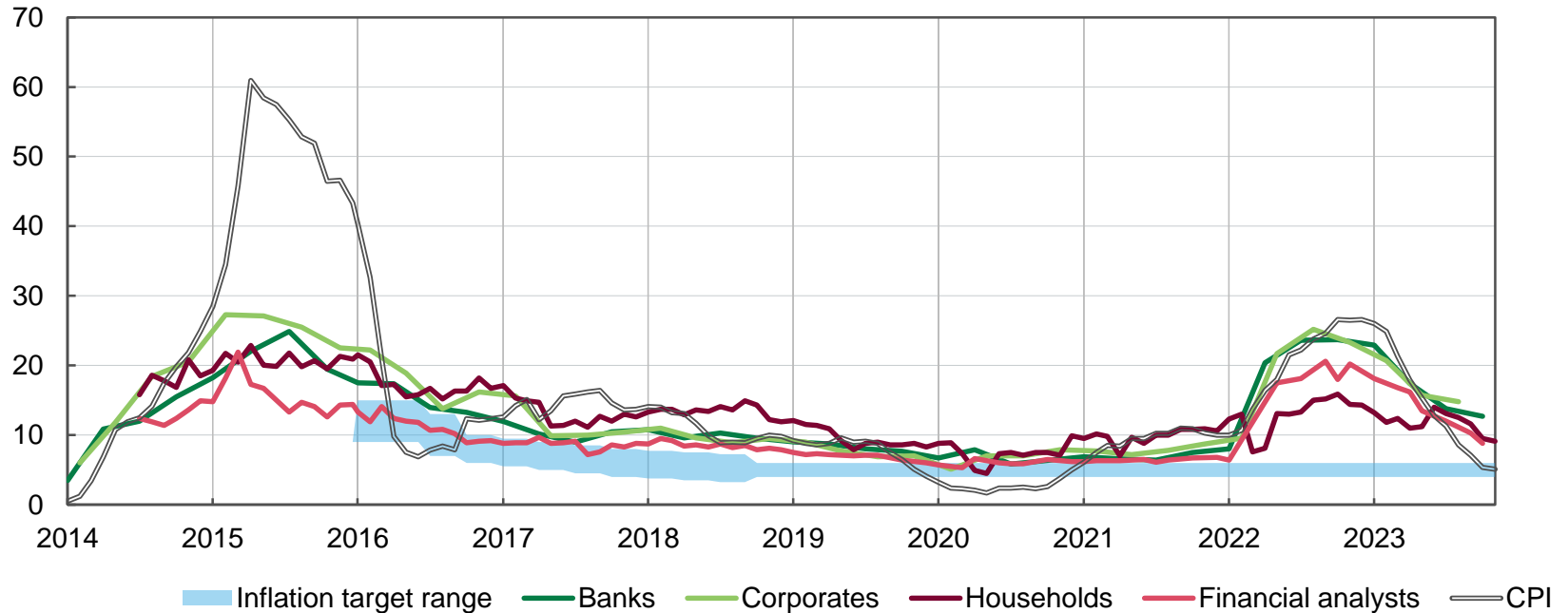
Motivation

Motivation

- Inflation expectations are among the essential elements in the monetary policy transmission mechanism and are essential for inflation stabilization. As a result, central banks aim to manage inflation expectations.
- Credibility of central banks is crucial in anchoring inflation expectations and ensuring the effectiveness of the transmission mechanism. It is also vital for garnering public support for central bank independence
- Credibility refers to the trust and confidence that the public and financial markets place in a central bank's ability to achieve its stated goals, i.e. inflation targets
- Maintaining credibility is an ongoing challenge for central banks, and they need to demonstrate their commitment to their stated objectives over time to continue effectively anchoring inflation expectations

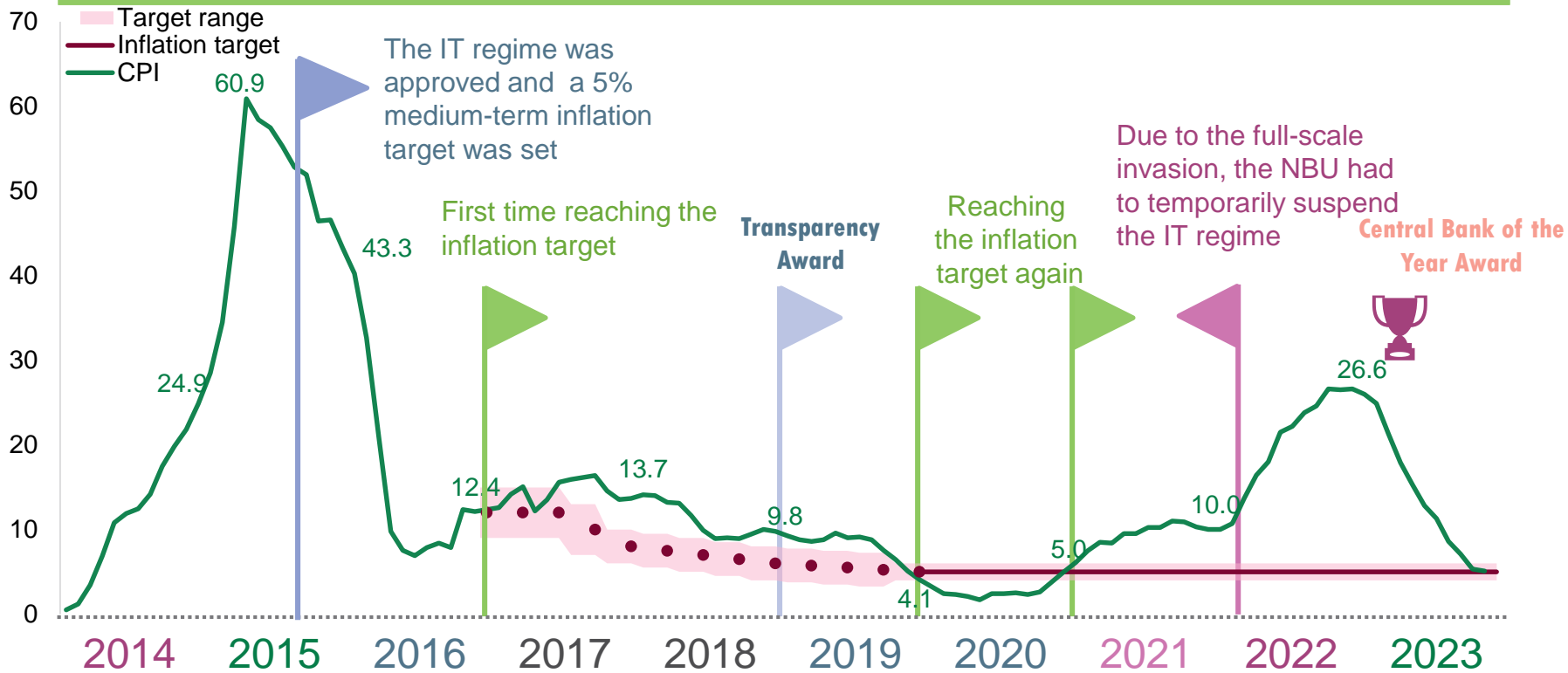
One year ahead inflation expectations in Ukraine are unanchored, despite gradual improvement

Consumer inflation, inflation target and 12-month-ahead inflation expectations, %



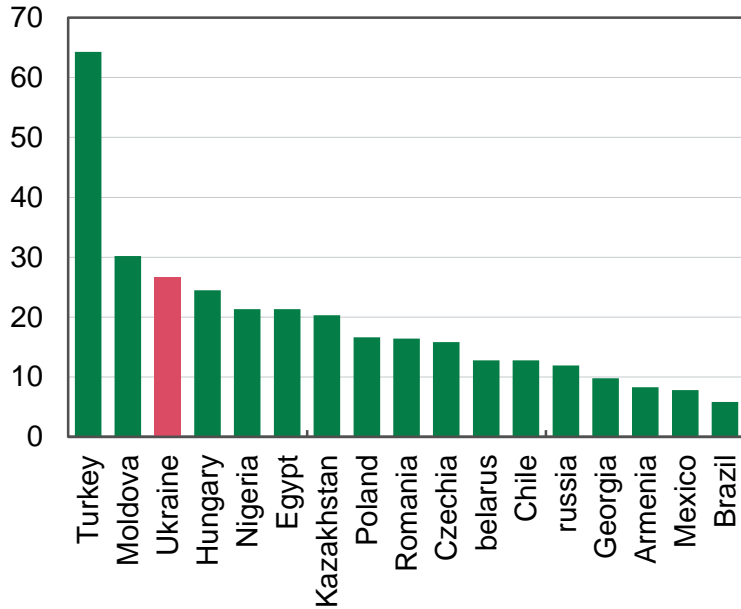
Source: NBU, SSSU, Info Sapiens.

Gaining trust

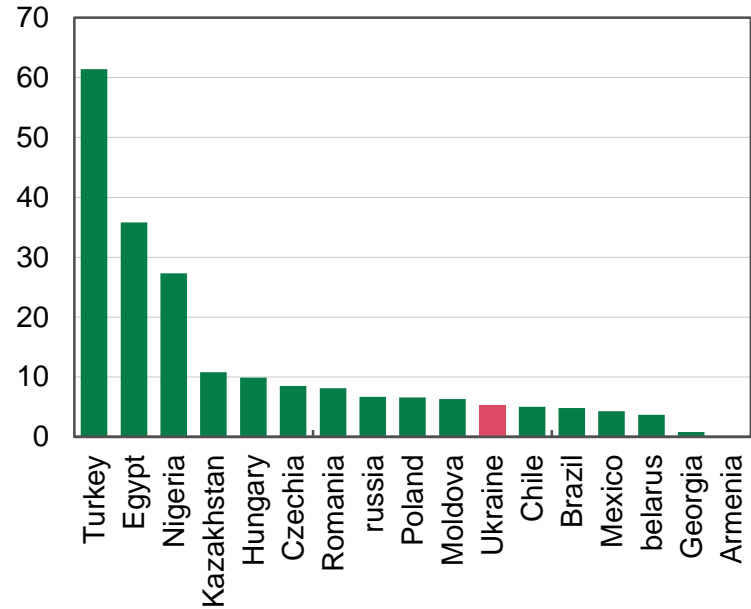


Inflation in Ukraine was lower compared to countries without war

Consumer inflation in December 2022, % yoy



Consumer inflation in October 2023, % yoy

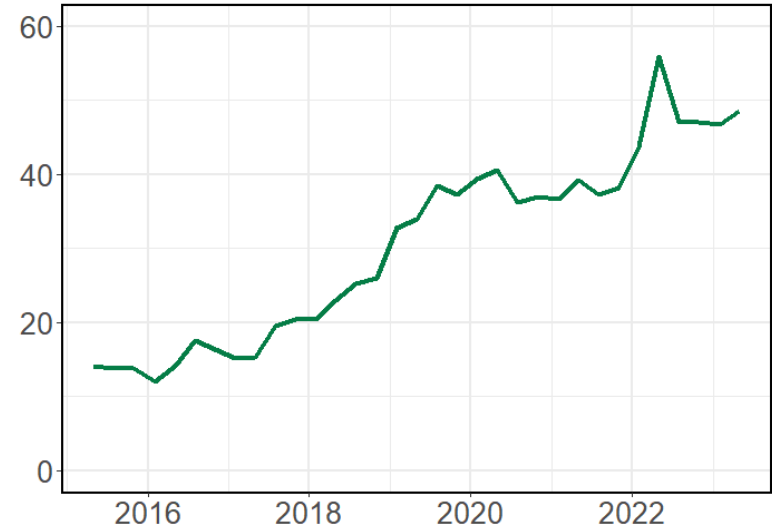


Pre-crisis activity helped to strengthen megaphone effect for NBU messages during crisis

Successful monetary policy communications in an `apocalyptic` scenario consist of several elements:

- Plan B needs to be prepared and updated
- Return to your routine communication practices ASAP
- Quick resolution of arising problems and feedback to the public
- Stay consistent despite an uncertain environment
- Stay transparent and honest
- Use all channels of communication
- Stay committed to the best MP practices.
- Consistent policies and communications in crisis times will only improve your credibility

Share of firms trusting the NBU's actions, %





Literature overview

The existing literature confirms that credibility can dampen inflation expectations

- Credibility makes the disinflationary process less costly and aids in maintaining low inflation once it has been achieved (Blinder, 2000)
- Better-anchored inflation expectations decrease the persistence of inflation, the effects of temporary shocks on inflation are reduced since the public does not overreact (Mishkin, 2007, and Bems et al., 2018)
- Empirical results from various studies (Christelis et al., Mellina et al., Niizeki, 2016-2023) affirm that a high level of trust in the central bank correlates with lower inflation expectations.
- A less credible central bank has less room to stabilize the economy (Faust and Svensson, 2001).
- Credibility is dependent on the type of monetary policy regime and is significantly affected by whether the shock can be linked to policy errors (Bordo, 2013).

How to measure credibility?

- Central bank credibility is elusive and fluid, with challenges in measurement and it is extremely difficult to measure or even assess credibility (Blinder, 2000)
- In particular, Svensson (1993) even suggests distinguishing between absolute credibility and credibility in expectation.
- Some researchers measure the degree of credibility as the distance between inflation expectations and the inflation target (Issler, 2023).
- We investigate the influence of central bank credibility on inflation expectations using data obtained from NBU's business surveys

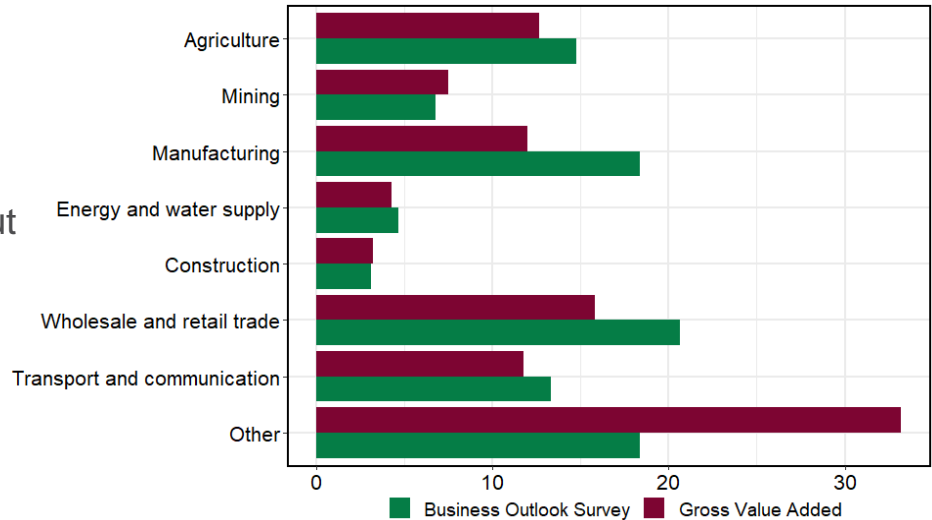


Data

Data

- Business Outlook Survey conducted by the NBU quarterly since 2006
- Population: non-financial sector enterprises
- Sample approach: quota-based, pro rata region and economic activities input into the country's gross value added.
- Sample: nearly 700 (excluding temporarily occupied Crimea, Donetsk, and Luhansk regions)

Sample structure by types of economic activity, %



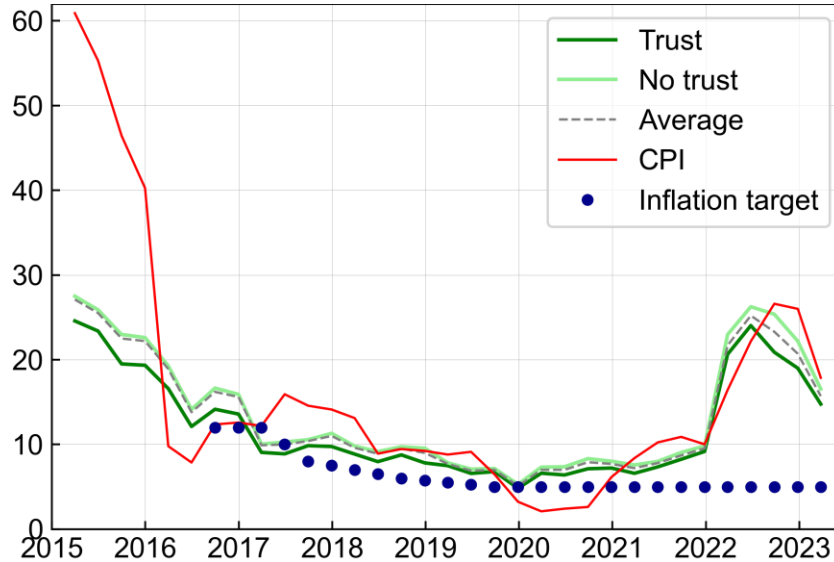
Data

26 questions are asked in each wave of the survey, of which the following were **used in the study**:

- main type of economic activity of the company
- size of the company by the number of employees
- whether the company performs export-import transactions
- change in the price level of consumer goods and services in Ukraine over the next 12 months (interval question)
- exchange rate of UAH to USD expected in 12 months (interval question)
- existence of problems with conducting operations with funds on the bank account
- trust to NBU's policy

Data

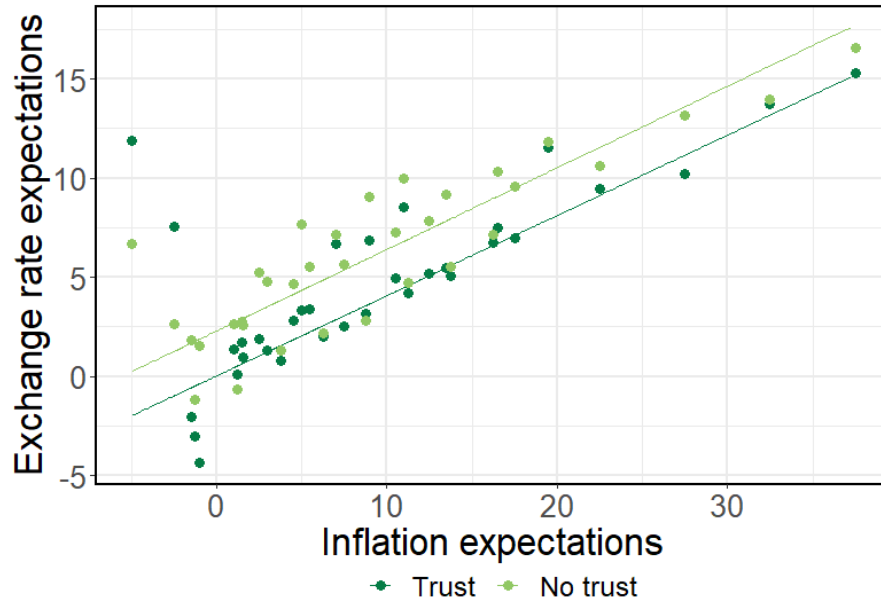
One-year ahead inflation expectation of firms and inflation target



- One year ahead inflation expectations of Ukrainian firms are unanchored due to:
 - the low initial credibility
 - the short history of inflation targeting
 - the significant inflation shocks in recent years
- Although the upward bias is lower for those who trust the NBU policy
- In 2022 expectations surged amid a full-scale Russian invasion, albeit spike in inflation beliefs of trusting firms is less pronounced.

Data

Interactions between inflation and exchange rate expectations



Note: The figure shows a binscatter for the joint distribution of inflation and exchange rate expectations. Expectations of the exchange rate are expressed in the form of a percentage change.

- Ukrainian firms tightly link their exchange rate and inflation forecasts
- This can be explained by the high level of the hryvnia exchange rate pass-through to inflation
- Thus, exchange rate volatility could lead to changes in inflation expectations, creating additional obstacles to inflation stabilization
- The regression slopes indicate that the strength of the connection is quite similar for “trustees” and not.



Methodology

Methodology: Ways to deal with potential endogeneity

- A two-step solution **endogenous treatment model** was proposed by Heckman (1978)
- Explicitly takes into account the discrete nature of the endogenous variable
- Overcomes endogeneity bias
- It can be easily compared with the IV approach without the necessity of including an instrument (Cerulli, 2015)
- The cost of not having an instrument to rely on is the necessity for the assumption of joint normality of the error terms in the system (Cerulli, 2015)

Methodology: Endogenous treatment model

Baseline specification (I)

$$E_t^i \pi_{t+4} - \pi_{t+4}^{tar} = f(\mathbf{Credibility}_t^i, \text{firm characteristics}, \text{time}, \varepsilon_{it})$$

$$\mathbf{Credibility}_t^i = \begin{cases} 1, & \mathbf{Credibility}_t^{i*} > 0 \\ 0, & \text{otherwise} \end{cases}$$

$$\mathbf{Credibility}_t^{i*} = f(\text{firm characteristics}, \text{time}, u_{it})$$

- Estimation sample: 2017q1 – 2023q2
- Maximum Likelihood estimation

Methodology: Endogenous treatment model

Adding gap between past inflation and the inflation target (II)

$$E_t^i \pi_{t+4} - \pi_{t+4}^{tar} = f(\text{Credibility}_t^i, (\pi_{t-1} - \pi_{t-1}^{tar}), \text{firm characteristics}, \text{time}, \varepsilon_{it})$$

... and exchange rate expectations (III)

$$E_t^i \pi_{t+4} - \pi_{t+4}^{tar} = f(\text{Credibility}_t^i, (\pi_{t-1} - \pi_{t-1}^{tar}), E_t^i e_{t+4}, \text{firm characteristics}, \text{time}, \varepsilon_{it})$$



Results

Results: Endogenous treatment model

Dependent Variable: Inflation expectations deviation from the inflation target			
Indep. Variables	End. treat.(I)	End. treat.(II)	End. treat.(III)
Credibility	-2.68***	-2.02***	-1.54**
Inflation deviation from the target	-	0.25***	0.25***
Inflation deviation from the target : Credibility	-	-0.10***	-0.09***
Devaluation expectations	-	-	0.35***
Devaluation expectations : Credibility	-	-	0.01
Correlation estimate	0.16**	0.14*	0.14*
P-value ind. eqs.	0.02	0.08	0.07

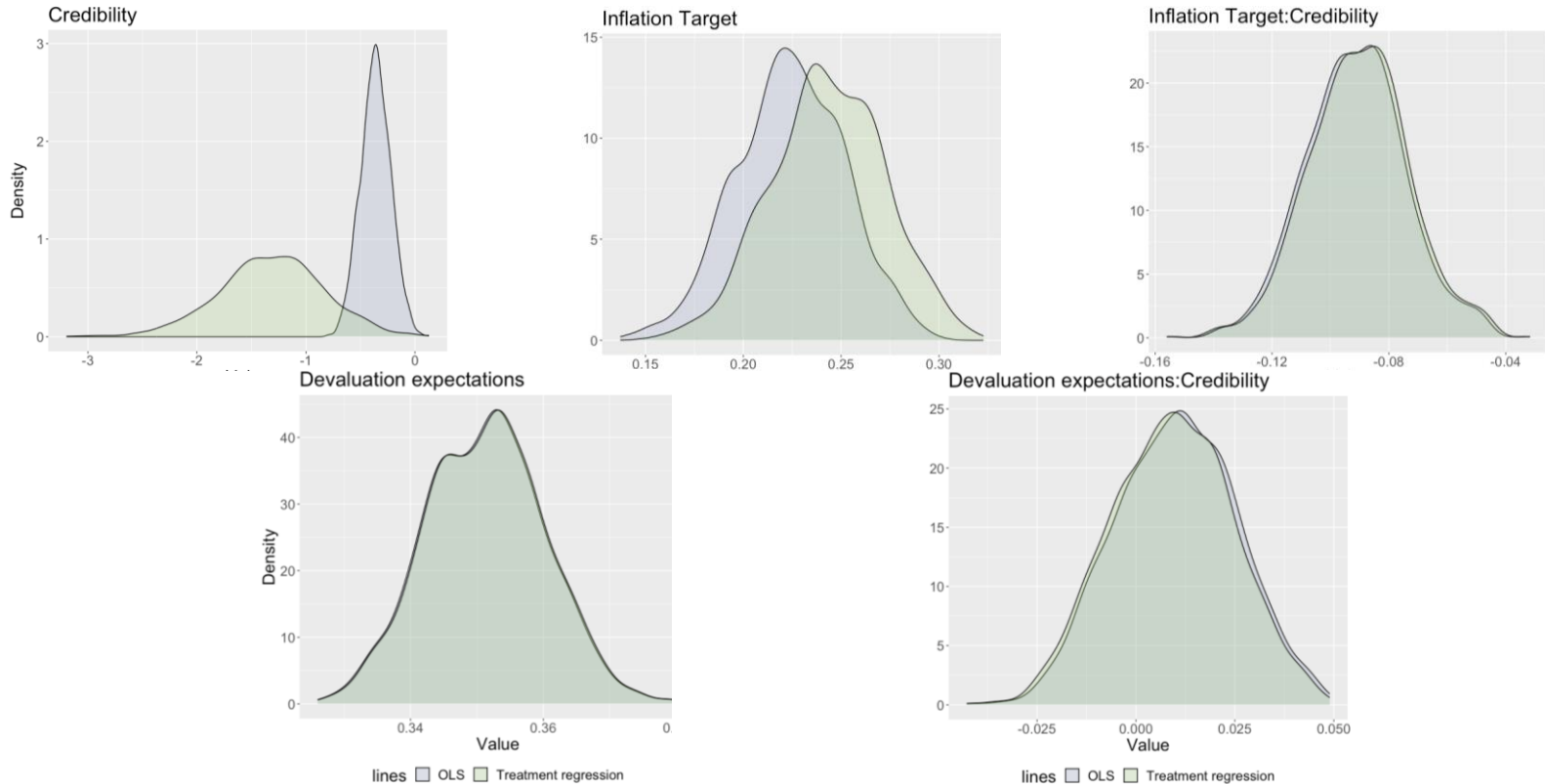
Note: ***, **, * indicate statistical significance levels at 1%, 5%, and 10% levels. Each model is based on 16779 observations; includes industry, size, international trade, and time dummies.

Results: Endogenous treatment model vs. OLS

Dependent Variable: Inflation expectations deviation from the inflation target						
Indep. Variables	End. treat.(I)	End. treat.(II)	End. treat.(III)	OLS (I)	OLS (II)	OLS (III)
Credibility	-2.68***	-2.02***	-1.54**	-1.23***	-0.69***	-0.34**
Inflation deviation from the target	-	0.25***	0.25***	-	0.23***	0.22***
Inflation deviation from the target : Credibility	-	-0.10***	-0.09***	-	-0.10***	-0.09***
Devaluation expectations	-	-	0.35***	-	-	0.35***
Devaluation expectations : Credibility	-	-	0.01	-	-	0.01
Correlation estimate	0.16**	0.14*	0.14*	-	-	-
P-value ind. eqs.	0.02	0.08	0.07	-	-	-

Note: ***, **, * indicate statistical significance levels at 1%, 5%, and 10% levels. Each model is based on 16779 observations; includes industry, size, international trade and time dummies.

Robustness check: Bootstrapping results for III model specification





Conclusions

Conclusions

- Modeling under different specifications consistently underscores the important role of central bank credibility in shaping and stabilizing inflation expectations.
- Firms that trust the central bank have inflation expectations closer to the target. They are less sensitive to past inflation deviations.
- Central bank credibility also helps firms' inflation expectations converge to published inflation forecasts.
- Credibility does not help to make inflation expectations less sensitive to exchange rate expectations.
- Although exchange rate expectations have the strongest impact on inflation expectations, this does not diminish the contribution of the credibility.

Policy implications

- Central bank credibility is proving to be a valuable tool for anchoring inflation expectations and providing flexibility in responding to economic shocks, especially in times of crisis.
- A credible central bank can confidently implement unconventional policies and reassure the public of the necessity and appropriateness of such measures.
- Consistently keeping inflation low and stable builds credibility. This credibility, in turn, stabilizes inflation expectations and contributes to overall economic stability.
- Building a strong reputation is a time-intensive process that often takes years or decades. However, a consistent commitment to long-term economic well-being is essential to establishing and maintaining credibility.

Policy implications

- The credibility built up during the period of inflation targeting, based on moderate inflation and the independence of the NBU, paid dividends at the beginning of the full-scale invasion
- This credibility helped maintain the NBU's freedom of action and allowed it to introduce unconventional monetary policy measures that helped protect macro-financial stability
- Inflation and exchange rate expectations were not sky-high at the start of the full-scale invasion and are now improving steadily. In addition, panic in the currency and financial markets has been avoided.



National Bank
of Ukraine

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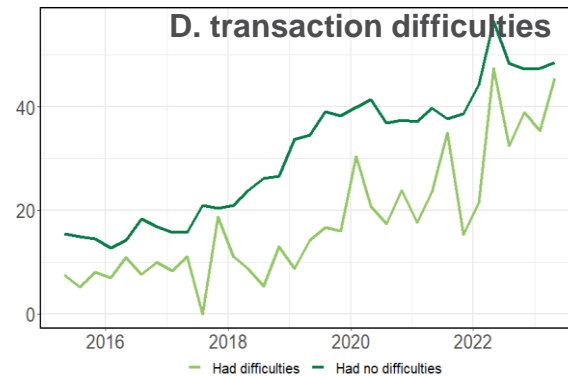
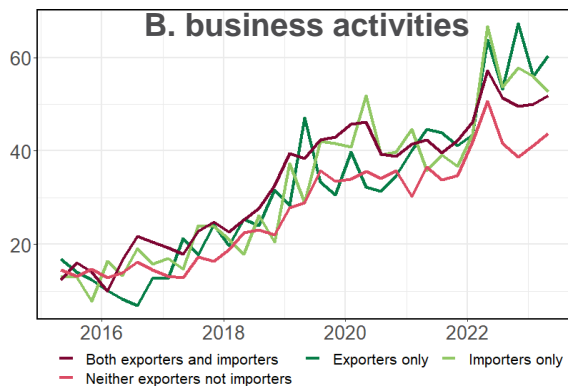
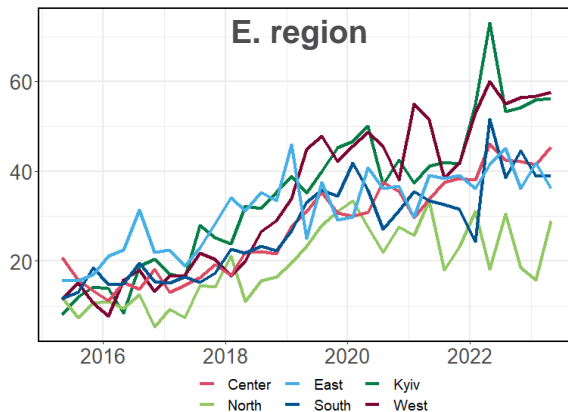
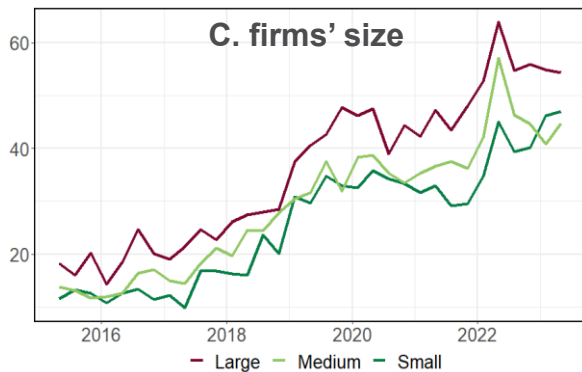
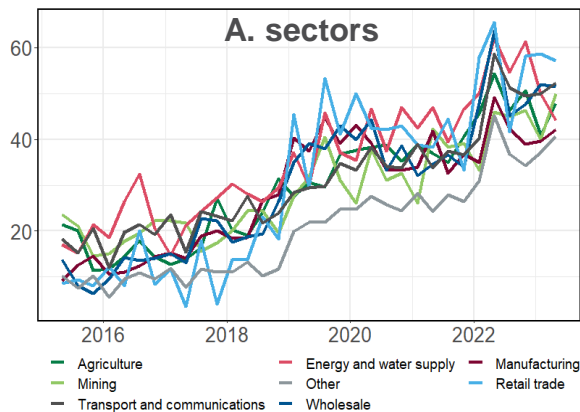
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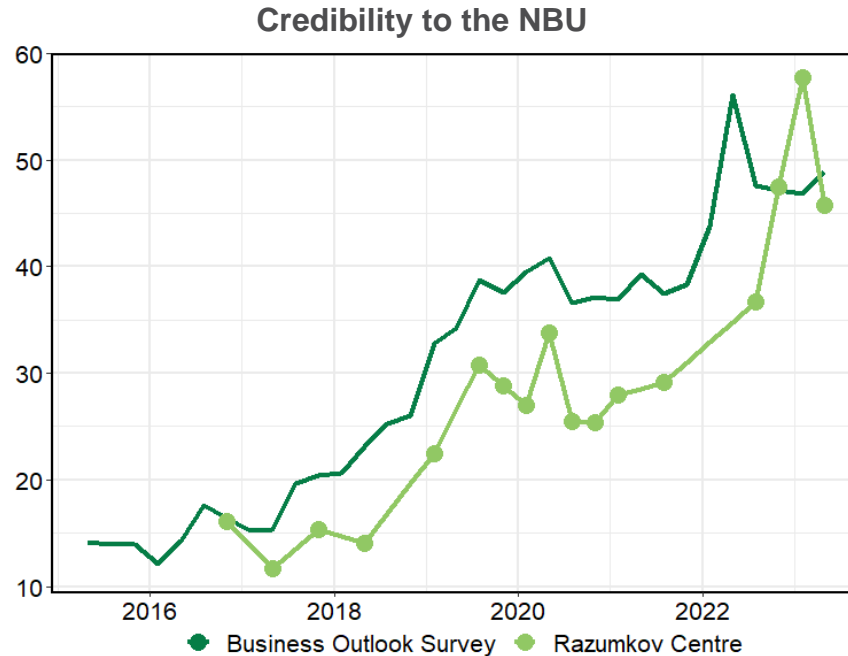
Appendix

Data

Credibility by...



BOS vs. Razumkov Centre



Note: The credibility level from the Razumkov center survey corresponds to the sum of total answers «fully trust» and «rather trust».

Probit estimates of credibility

Dependent Variable: Credibility			
Region			
		Chernivtsi	0.16
Volyn	0.02	Chernihiv	-0.11
Dnipropetrovsk	-0.06		
		Industry	
Zhytomyr	-0.43***	Mining	0.08
Zakarpattia	0.63***	Manufacturing	-0.17***
Zaporizhzhia	0.13	Energy and water supply	0.06
Ivano-Frankivsk	0.22*	Construction	-0.34***
Kyiv and Kyiv region	0.31***	Wholesale	-0.05
Kirovohrad	-0.14	Retail	0.03
Lviv	0.34***	Transport	-0.07
Mykolaiv	-0.25**	Other	0.11**
Odesa	0.07		
		Size	
Poltava	-0.12	Medium	0.11***
Rivne	0.27**	Large	0.36***
Sumy	-0.09		
		International trade	
Ternopil	0.61***	Importers only	0.01
Kharkiv	0.16*	Both exporters and importers	0.03
Kherson	0.07	Neither exporters nor importers	-0.12**
Khmelnyskyi	0.43***		
		Banking transactions	
Cherkasy	0.34	Had no difficulties	0.49***
Time dummies			+
N			16779
Log-likelihood			-9994.1016
Pseudo R ²			0.08

Notes: The model includes dummies for each region, except for Vinnytska, for each sector of the economy, except for agriculture. The dummies for small firms and those engaged only in export operations are also excluded. Finally, the firm-specific controls include a dummy that takes unity if the firm has no difficulties with providing operations with their funds and zero otherwise.

***, **, * indicate statistical significance levels at 1%, 5%, and 10% levels

Robustness check: alternative specification

Indep. Variables	Dependent Variable: Inflation expectations deviation from NBU inflation projections		
	End. treat. (I)	End. treat. (II)	End. treat. (III)
Credibility	-2.32***	-1.85***	-1.37**
Inflation deviation from NBU inflation projections	-	0.19***	0.22***
Inflation deviation from NBU inflation projections: Credibility	-	-0.1***	-0.09***
Devaluation expectations	-	-	0.34***
Devaluation expectations : Credibility	-	-	0.01
Correlation estimate	0.13**	0.13*	0.12*
P-value ind. eqs.	0.03	0.06	0.07

Note: ***, **, * indicate statistical significance levels at 1%, 5%, and 10% levels. Each model is based on 16779 observations; includes industry, size, international trade and time dummies.