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## EMPIRICAL ANALYSIS OF FOREIGN EXCHANGE VOLATILITY AND RATIONAL EXPECTATIONS ON CENTRAL BANK TRANSPARENCY

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**Abstract.** Today the Central Bank actions are under a big scrutiny from economic agents and government. Thus, it has been raised the question of the reasonable level of regulator's openness. Under risen volatility in the foreign exchange rate and range of financial variables it has opened the question of rebuilding a current communication policy of monetary authority with the aim to maintain the confidence of economic agents that supporting price stability is the prior task of Central Bank. Also irrational behavior of agents can lead to failure of conducting monetary policy of Central Bank. Therefore, more magnitude of volatility in financial variables evokes less transparent dealing of Central bank, while one pursues monetary policy strategy. That is why in this paper empirical relationship between risen volatility magnitude, providing the implicit target, maintaining price stability target on a one hand and openness in economic, political, procedural, monetary and operational aspects of regulator transparency in an another will be considered and discussed.

**Keywords:** rational expectation, central bank's policy transparency, volatility of foreign exchange rate, Eijffinger-Garaats index.

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## ЕМПІРИЧНИЙ АНАЛІЗ ВПЛИВУ ВОЛАТИЛЬНОСТІ ВАЛЮТНОГО КУРСУ І РАЦІОНАЛЬНИХ ОЧІКУВАНЬ НА ТРАНСПАРЕНТНІСТЬ ЦЕНТРАЛЬНОГО БАНКУ

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**Анотація.** Сьогодні дії центрального банку перебувають під пильним наглядом суспільства та уряду, що піднімає питання щодо прийнятного рівня відкритості регулятора. За умов підвищеної волатильності курсу валют і фінансових ринків постає потреба в перебудові поточної комунікаційної політики центральних банків із метою забезпечення впевненості економічних агентів у тому, що підтримка стабільності є першочерговим завданням центральних банків. Була помічена одна закономірність, за якої справджується таке: що вище значення волатильності фінансових змінних, то менш прозорою буде монетарна стратегія центрального банку. Саме тому, з одного боку, розглянуто емпіричний зв'язок між зростанням волатильності, установленням імпліцитного таргету та забезпеченням стабільного рівня цін у країнах із режимом таргтування інфляції, а з другого — їхній вплив на відкритість регулятора в економічних, політичних, процедурних, монетарних та операційних аспектах. Для цього була застосована логіт-модель, де фіктивною змінною виступала транспарентність регулятора. За допомогою інтегрування функції щільності розподілу функції оцінки транспарентності регулятора було отримано розподіл імовірностей задля визначення рівня вірогідності отримання відповідної оцінки відкритості за відповідного сценарію подій. До панельної вибірки були включені регулятори 10 розвинутих країн і п'ять економік, що розвиваються. Також на основі отриманої моделі оцінки транспарентності регуляторів було оцінено відкритість монетарної політики Національного банку України. Було з'ясовано, що за зростання волатильності валютного курсу і відхилення від кінцевої інфляційної цілі регулятор стає більш політично закритим і рідше надає інформацію про процедурні операції. Економічно регулятор стає більш прихованим за наявності в системі цілей регулятора імпліцитного якоря, такого як валютний курс. А непередбачувані шоки фінансового ринку зменшують відкритість регулятора в публікаціях прогнозів макроекономічного розвитку в результаті реалізації відповідного курсу монетарної політики. Також поставлена логіт-модель показала, що монетарна політика, заснована на правилі та з єдиною ціллю, яка полягає в підтриманні цінової стабільності, виявилась більш ефективною в мінімізації волатильності валютного курсу, порівняно з монетарною політикою, що спирається на імпліцитний якор. Модель буде корисною при оцінюванні можливих соціально-економічних ефектів від зміни комунікаційної стратегії центрального банку.

**Ключові слова:** раціональне очікування, транспарентність політики центрального банку, волатильність курсу валют, індекс Ейфінгера — Гераац.

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## ЭМПИРИЧЕСКИЙ АНАЛИЗ ВЛИЯНИЯ ВОЛАТИЛЬНОСТИ ВАЛЮТНОГО КУРСА И РАЦИОНАЛЬНЫХ ОЖИДАНИЙ НА ТРАНСПАРЕНТНОСТЬ ЦЕНТРАЛЬНОГО БАНКА

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**Аннотация.** На сегодняшний день действия центрального банка находятся под пристальным вниманием экономических агентов и правительства. Поэтому всяческий раз поднимается вопрос о разумном уровне открытости регулятора. Под давлением возрастания волатильности валютного курса и финансовых переменных остается неурегулированным вопрос о перестройке сегодняшнего порядка коммуникации монетарной власти с общественностью с целью сохранения убеждения экономических агентов касательно приоритетности задания ценовой стабильности в иерархии целей центральных банков. Также иррациональное поведение агентов может стать причиной провала монетарной политики центральных банков. Поэтому автор утверждает, что чем более волатильный валютный курс на рынке, тем более будет закрытой политика центрального банка в стране. Из этих соображений, с одной стороны, анализируется связь между возникновением повышенной амплитудой волатильности валютного курса, присутствием имплицитного таргета, с одновременным поддержанием цели по ценовой стабильности и, с другой стороны, открытостью регулятора в экономическом, политическом, процедурном, монетарном и операционном аспектах.

**Ключевые слова:** рациональные ожидания, транспарентность политики центрального банка, волатильность валютного курса, индекс Эйфингера — Гераац.

Формул: 5; рис.: 1; табл.: 6; библи.: 35.

**Introduction.** The problem of central bank openness lays on dimension of rational expectations of economic agents, which can be negative if regulator expresses intentions to raise interest rates, and thus lead to reducing aggregate demand and in another case when central bank is plunging interest rates, economic agents can assess such action as a plausible scenario of rising inflation pressure. Only by that reason many regulators try to hide important decisions from community and conduct inconsistent monetary policy with a hope to tackle outcomes, which come from external and internal shocks. But such inconsistency in policy evokes significant fluctuations in financial variables, especially in foreign exchange rate, because economic agents don't trust to chosen by regulator monetary strategy and make a decision that effects in an opposite direction to price stability and settling down foreign exchange volatility.

Robert Lucas in his work "Econometric Policy Evaluation: A Critique" (1976) has described such problem by game theory modeling the strategy of regulator and answer steps, which are making by economic agents. And discretionary policy was the factor of exceeded disturbances in financial variables, therefore economic agents in each step, which made by Central Banker, and each established target change their own economic decision. That's why policy, which is conducted by regulator must be open and in form of a clear policy rule.

By Kydland and Prescott (2004) inconsistent policy is a new inference for accelerating inflation. Therefore, the final objective of monetary policy must be non-short term designed, but long term, which leads to stabilization [2, p. 2]. Also, William Duisenberg (1998) outlined that implicit target policy is required more secrecy in Central bank's decision-making process and more discretion for obtain committed target in a path of economic growth, maintaining financial stability and employment.

J. Scott Davis and Ippei Fujiwara (2015) "Dealing with Time-Inconsistency: Inflation Targeting vs. Exchange Rate Targeting" [3] explore that for open economies single explicit target consistent with monetary policy objective is very supportive in conducting monetary policy strategy.

That's why we will consider impact of the eliminative factor of availability of implicitly determined target by Central Bank as a factor of reducing its transparency and promoting foreign exchange rate volatility.

**Literature review.** Central bankers today are decidedly dominant figure in macroeconomic policy making, but they would be thoroughly underestimated to their peers who governed during most of the 20th century. Not only the kind of central bankers differs, but much more it varies their tactics and monetary policy strategies. The main conductors of monetary policy are pulling back the shadow of secrecy, and starts to share their views with an increasingly demanding public. "Transparency is the watchword for monetary policy, and greater openness the hallmark of the modern central bank", — emphasized Warsh in forming proposal to optimizing size of regulator openness [5, p. 15].

In the last century, central banks considered their secrecy in conducting monetary policy is a necessary condition for success. This approach was best associated with Montagu Norman, the Governor of the Bank of England (1920—1944), which declared: "never explain, never excuse" (Boyle, 1967) [6].

As an academic, Ben Bernanke (2004), which stands on protecting the position on getting greater openness and a clearer communication policy, states: "Norman was hardly unique. Central bankers long believed that there was a certain 'mystique' attached to their activities; that making monetary policy was an arcane and esoteric art that should be left solely to the initiates; and that letting the public into the discussion would only usurp the prerogatives of



insiders and degrade the effectiveness of policy.” [7, p. 1] Thus he has cut all concerns regardingly failing to meet economic agents’ expectations and losing their trust, but not resolve doubt in the impact of making contribution to strengthen financial variables volatility.

As a practitioner, in his role as Chairman of the Federal Reserve, Bernanke pursued a new policy regime. The “never explain, never excuse” maxim of the Norman era was replaced by a widelyheld, new consensus in the central banking community, which based on full communicating about views, shared by members of monetary policy committee on how to conduct monetary policy. And Blinder et al. (2008) affirm: “...communication policy rose in stature from a nuisance to a key instrument in the central banker’s toolkit” [8, p. 944].

To some, transparency became not only a virtue unto itself, but also a newly sharpened arrow in the central bank’s quiver, an essential requirement for achieving its monetary policy objectives. Woodford (2005) puts it into strict formulation: “For not only do expectations about policy matter, but, at least under current conditions, very little else matters” [9, p. 15]. This approach has obtained general confirmation and become the dominant policy thesis. Mostly, policymakers chose to emphasize not simply the current choice of policy rates, but also the expected future path of policy with the aim to change broader monetary conditions based on the complex behavioral system of equilibrium settling.

We must clarify, which components comprises regulator transparency with the aim assess its vulnerability to financial market volatility. After the Eijfinger and Garaats (2014) [10, p. 7–8] Central bank possesses 5 elements, which describes the levels of its openness:

1. Political transparency concerns the objectives of monetary policy. Examples of political transparency include the establishment of formal and quantitative objectives for which policymakers are responsible.

2. Economic transparency concerns the economic information that forms the key inputs to the formulation of policy. It includes the publication of economic forecasts and the disclosure of the economic models used to make those forecasts. The Monetary Policy Committee’s (further MPC) of Bank of England Inflation Report, for instance, includes details of its forecast projections [5, p. 17].

3. Procedural transparency concerns openness about how decisions are made. It includes publishing the minutes and voting records of monetary policy meetings. This is the type of transparency most directly implicated in considering publication of transcripts. Such practice was successfully employed by Bank of Japan and National Bank of Poland.

4. Policy transparency concerns timely and comprehensive openness about the decisions themselves. Examples include the announcement and rationale of a policy decision. By example, the US Federal Reserve issues a policy statement and explanation alongside its policy decisions shortly after the close of each meeting.

5. Operational transparency concerns the implementation and transmission of the central bank’s policy decision. It includes ex-post evaluations of the policy decision. Examples of operational transparency

include published evaluations of forecast performance [10, p. 56].

Jarmuzek M., Orlowski L., Radziwill A. (2003) [18, p. 8–9] disclose these range of transparency criteria as dimensions, which force the simple model of the economy:

– the central bank’s loss function value and GDP gap beta coefficient indicate the willingness of monetary authority to assign preference to control GDP gap narrowing or maintaining price stability, and explicitly made decision shows the level of political transparency,

– the disclosure of trajectory of components of aggregate demand function demonstrates the level of economic transparency,

– a new-Keynesian Phillips curve is a basis of constructing central bank’s reaction function measures monetary policy transparency,

– the equation of instrumental rule as next:

$$i_t = f(\pi_{t-i}, \pi^e, y_t) + e_t, \quad (1)$$

where  $\pi_{t-i}$ ,  $\pi^e$ ,  $y_t$  and  $e_t$  — respectively inflation time series at the moment  $(t - i)$ , expected or targeted level of inflation, output and financial shocks denote the instrumental preference of central bank, i.e. procedural transparency.

We may add our commentary on a one peculiar causality relationship of last transparency component to economy model: operational transparency uses to be a minimizing forecasting error function justified by the factor of disconnection between macroeconomic factors due to the simultaneous impact of permanent and intertemporal shocks. And we must admit that it’s very hard task to agree that you as a policy maker can’t control main policy mandates fully before the community.

Numerous works have been devoted to the evaluating effects of greater openness, which splitting into 5 components, on monetary stability and, of course, financial system overall sustainability. By Garaatz, P. (2013) [12, p. 2], greater economic openness might have a negative impact on inflation making it more volatile, as first shown by Cukierman (2001) [13, p. 34]. But If we will update inflation expectations and incorporate it into the monetary policy transmission process, economic transparency could even fully eliminate the bias of inflation from targeted value [14, p. 14]. Furthermore, Faust and Svensson (2001) have proved that operational transparency gives a rise of a positive incentive effect that could reduce the inflation bias.

So, all position or criteria of central bank openness will be assessed threat of financial variables volatility and availability of implicit target rule. For that, we will estimate the probabilities of providing transparent monetary policy practices by a Central Banker under financial volatility and implicit target dominance circumstances for 10 advanced economies with best transparent practices, CEE countries such as Poland, Czech Republic, Hungary, Slovakia and one CIS country as Georgia. We want to put our attention on Central Banker’s openness in countries from Post-Soviet Union area due to the lack of studies in this area and significant level of transitory effects in their national banking systems, which are suffering from continuous process of transformation. Thus, we have included Georgia and 4 Visegrad countries’ variables into the Bayesian



model. Then overall probability forecast of Central Banker’s transparency for advanced and emerging economies panel will be given and a summary for Ukrainian Central Banker’s case will be provided. Such investigation will be significant development in direction of determining influence of central bank openness on tackling volatility clustering in financial variables especially in foreign exchange rate disconnection.

**Model, data, and methodology.** In our proposed Transparency Measuring Maximum Likelihood model (TMMLM) we want to test the hypothesis that openness of regulator, which depends on financial variables vulnerability and thus requires to determine clear monetary rule. With this aim, it will be determined the relationship between the openness of regulator’s action and availability of implicit target, purpose of maintaining price stability and a risen foreign exchange volatility. It is clear that at Central Banker’s openness we can be estimated as a binary choice function, where maximum mark in 3 points will equal to 1, and in rest of cases hidden variable (let name) gets null value.

Such maximum likelihood model implication was successfully used in Eichler et al. (2017) [15, p. 13] in analyzing the effect of central bank transparency on cross-border bank activities, where was implemented Poisson-pseudo maximum likelihood method of econometric modeling. But this method is more applicable for dynamic models, which characterized with Markov time-continuous chain process as firstly described by Hyrien et al. (2005)[16, p. 200]. For our model and proving of our hypothesis we chose classical Bayesian model of maximum

likelihood method as in Leurox and Puterman(1992) [17, p. 547].

The assessments of central banks’ transparency will be used from investigations of Dincer and Eichengreen(2014) [11, p. 198—204] for 10 regulators of advanced countries.

The logit model of transparency binary choice will be formalized in a next way:

$$f(y_i = 1|x_i) = \frac{1}{1+e^{-z_i}}, \quad (2)$$

$$z_i = \beta_0 + \beta_1 \cdot IA_i + \beta_2 \cdot IT_i + \beta_3 \cdot FERV_i. \quad (3)$$

where  $x_i$  — conditional level of independent variable for time series from 2014—2016,

$\beta_0$  — omitted factors, which we consider as volatility of financial market variables,

$IA_i$  — dummy variable of presence of implicitly appointed monetary target,

$IT_i$  — level of targeted stable price level,

$FERV_i$  — foreign exchange rate volatility time series,

$\beta_1, \beta_2$  and  $\beta_3$  — marginal effects on risen chance probability on transparency of monetary authority.

$$P \left( \text{Ln} \left( \frac{y_i=1}{y_i=0} \right) \right) = \text{Ln}(e^{\beta_0 + \beta_1 \cdot IA_i + \beta_2 \cdot IT_i + \beta_3 \cdot FERV_i}) = \\ = \beta_0 + \beta_1 \cdot IA_i + \beta_2 \cdot IT_i + \beta_3 \cdot FERV_i = z_i. \quad (4)$$

Last comment on calculation of foreign exchange rate volatility values: for it we have extract natural log of division of exchange rate in current ( $FER_t$ ) period to previous ( $FER_{t-1}$ ):

$$FERV_t = \text{Ln} \left( \frac{FER_t}{FER_{t-1}} \right). \quad (5)$$

Table 1

Description of the sample and the data panel for building Transparency Measuring Maximum Likelihood Model (TMMLM)

Features	Advanced countries panel	Emerging countries panel
Observed Central Banks’ transparency countries	Sweden New Zealand England European Union United States Japan Norway Canada Australia Switzerland	Ukraine Georgia Poland Czech Republic Hungary Slovakia
Dummy variables	implicit anchor – inflation, unemployment, GDP gap	implicit anchor - monetary aggregates, GDP gap, inflation
Regressors	inflation target, log of nominal effective foreign exchange growth, nominal effective foreign exchange rate	inflation target, log of nominal effective foreign exchange growth, nominal effective foreign exchange rate
Resulted variable	political transparency (score varies from 0 to 3), economic transparency (score varies from 0 to 3), procedural transparency (score varies from 0 to 3), policy transparency (score varies from 0 to 3), operational transparency (score varies from 0 to 3)	political transparency (score varies from 0 to 3), economic transparency (score varies from 0 to 3), procedural transparency (score varies from 0 to 3), policy transparency (score varies from 0 to 3), operational transparency (score varies from 0 to 3)
Data sources	Centralbanks’ websites, InflationReportsfortheyearunder examination, AnnualReports, Minutes, Decisionrationale	

Source: Monetary policystatements of Central Banks’ [21; 35] and [10; 11; 20].

**Data.** We have gathered data panel on ten advanced countries and five emerging countries (see Table 1) from 2011 to 2016, where is collected assessment scores on

transparency measured and published by Eijfinger and Garaatz (2006) index method. The choice of advances countries in the panel is justified by availability of



calculated assessments on transparency conducted by Dincer and Eichengreen (2014). The emerging market panel comprises the new economies of Eastern European region as a Poland, Czech Republic, Hungary and Slovakia with regards to developments in assessing openness in this countries' panel at work of Jarmuzek M., Orłowski L., Radziwill A. (2003)[18, p. 11—14], Szyszko M. (2016) [19, p. 22—23]. Within emerging countries in CIS Union, there is existed a huge gap, and only available research on measuring transparency level of National Bank of Georgia [20, p. 50, 56].

As we have outlined in the purpose of this paper the level of transparency National Bank of Ukraine is still not well researched.

The empirical results and discussion. The model demonstrates next empirical relationships between reason to great openness under volatility threat and rational expectations of economic agents.

In Table 2 the economic openness probability in central bank procedures are depending from volatility magnitude in the internal worth of national currency and implicitly determined target. And if volatility rises, the less open policy of monetary regulator will become (for each percent of the depreciation of the currency the probability of economic forecasting openness eases on 1.06% in 2014 and 3.93% in 2016). All effects derived by regressors are strengthened in direction of transparency policy conducting within 3 years.

Table 2

Properties of logit function of economic transparency

	2014				2017			
	coefficient	standard error	z-statistics	probability	coefficient	standard error	z-statistics	probability
Financial market volatility ( $\beta_0$ )	22.122	39.067	0.566	0.571	58.136	5031.105	0.012	0.991
Implicit target ( $\beta_1$ )	-0.428	1.331	-0.322	0.748	-20.304	6148.594	-0.003	0.997
Inflation target ( $\beta_2$ )	-0.111	0.684	-0.162	0.871	41.089	7944.395	0.005	0.996
Foreign exchange volatility ( $\beta_3$ )	-4.682	8.423	-0.556	0.578	-17.233	13.954	-1.235	0.217

Source: author's estimation

In 2014 the panel of 15 central bankers demonstrates next result, that chance of rise economic transparency in publishing implicit target drops on 10.7 percentage points in terms of marginal effect and surging of magnitude of foreign exchange volatility leads to 4.68 % of decreasing chance ratio.

The political transparency will slide down to 4.76 % of plausibility under threat of intensifying vulnerability in the financial market. But openness of discussion on Monetary policy council body of monetary authority is strengthening under foreign exchange volatility risk

and committing implicit target. The foreign exchange volatility factor influence has become more robust in 2016 comparatively to 2014. Respectively influence of volatility of financial markets in 2017, thus we have a such situation that current stability on ones in developed countries has supported the more probability of become central bankers more transparent in an economic sense. Implicit target in 2017 has been existed in countries with the worst economic transparency score. The success in short-term horizon in meeting inflation target has also led to more openness in economic forecasting of regulator by 41 %.

Table 3

Properties of logit function of political transparency

	2014				2017			
	coefficient	standard error	z-statistics	probability	coefficient	standard error	z-statistics	probability
Financial market volatility ( $\beta_0$ )	-25.529	65.871	-0.388	0.698	-23.938	24.555	-0.9749	0.32962
Implicit target ( $\beta_1$ )	-0.353	1.487	-0.237	0.812	-17.470	3.756·e <sup>3</sup>	-0.0047	0.99629
Inflation target ( $\beta_2$ )	1.219	1.046	1.166	0.244	19.233	3.756·e <sup>3</sup>	0.0051	0.99591
Foreign exchange volatility ( $\beta_3$ )	5.391	14.181	0.380	0.704	5.039	5.297	0.9513	0.34147

Source: author's estimation

The procedural openness slightly depends on committing implicit target and promotes under foreign exchange rate instability and rising inflation target level. The vulnerability of financial and part of money market cause the more hiddenness of forecast reporting and explaining by regulator on 23.93% in 2017.

On table 4 is shown parameters under regressors in the logit model of determining procedural transparency of central banks. It should be given one remark, that parameters under regressors were elasticities of increasing chance ratio of obtaining high point of procedural transparency.



Table 4

## Properties of logit function of procedural transparency

	2014				2017			
	coefficient	standard error	z-statistics	probability	coefficient	standard error	z-statistics	probability
Financial market volatility ( $\beta_0$ )	8.595	15.348	0.560	0.575	-7.422	21.716	-0.3418	0.73254
Implicit target ( $\beta_1$ )	0.455	1.282	0.355	0.722	1.020	1.439	0.7093	0.47812
Inflation target ( $\beta_2$ )	-0.019	0.598	-0.032	0.975	-0.025	1.737	-0.0145	0.98840
Foreign exchange volatility ( $\beta_3$ )	-1.947	3.391	-0.574	0.566	1.462	4.707	0.3106	0.75608

Source: author's estimation

The monetary transparency under a condition of world economy vulnerability has been slightly increased, especially under implicit target settled by discretion on 1.24% and this coefficient under the asymptotical assumption is consistent and robust. But announcements of adjusting monetary policy rule will be done with short lag with probability chance on 97.6% in 2017 comparatively to 98.1% in 2014. Also, very robust the inflation targeting

effect on monetary policy announces is demonstrated in Ukraine under volatility pressure on 10.5%. In a case of huge deviation between reported inflation and target probability of disclosing details of liquidity operations will be reduced to 2.5 p.p. Therefore volatility of financial market reduces probability on 7.4%. But volatility of foreign exchange rate promotes to more transparency of procedural aspects at open foreign exchange market at 1.5%.

Table 5

## Properties of binary choice function of monetary transparency

	2014				2017			
	coefficient	standard error	z-statistics	probability	coefficient	standard error	z-statistics	probability
Financial market volatility ( $\beta_0$ )	16.304	15.848	1.029	0.304	-29.394	25.673	-1.1450	0.25223
Implicit target ( $\beta_1$ )	0.030	1.291	0.023	0.981	1.901	1.526	1.2459	0.21278
Inflation target ( $\beta_2$ )	0.406	0.617	0.658	0.510	-0.016	1.796	-0.0090	0.99280
Foreign exchange volatility ( $\beta_3$ )	-3.714	3.509	-1.059	0.290	6.216	5.529	1.1242	0.26091

Source: author's estimation

That's why monetary policy transparency with explicit foreign exchange rule and clear mandate of maintaining price stability lead to strong positive attitude from economic agents. But deviation from inflation target leads to decreasing of monetary policy transparency score on 1.6 p.p.

Finally, operational transparency is becoming very unsustainable in recent years and this fact may be

explained by huge cliff between central bank's independence and discretion in conducting operations at the open market.

Till to our days majority of regulators are coordinated its operation at the open market after consultation with the government with the aim to coordinate future outcomes with state economic policy target.

Table 6

## Properties of logit function of operational transparency

	2014				2017			
	coefficient	standard error	z-statistics	probability	coefficient	standard error	z-statistics	probability
Financial market volatility ( $\beta_0$ )	-9.603	7298.858	-0.001	0.999	-30.582	$6.155 \cdot e^3$	-0.005	0.996
Implicit target ( $\beta_1$ )	19.796	7297.303	0.003	0.998	18.458	$6.207 \cdot e^3$	0.003	0.997
Inflation target ( $\beta_2$ )	-1.940	2.519	-0.770	0.441	-0.021	$8.741 \cdot e^3$	0.000	1.000
Foreign exchange volatility ( $\beta_3$ )	-2.095	32.418	-0.065	0.948	2.389	$6.963 \cdot e^3$	0.343	0.732

Source: author's estimation



For advanced economies, we have obtained next results:

- the existence of implicit anchor in monetary policy leads to increasing of economic openness on 13.8 percentage point, easing political openness on 4.9 p.p., tightening procedural policy on 36 p.p. and monetary policy openness chance ratio is worsen 54 p.p., but operational transparency probability ratio is outweighed on a side of more open communication provided by Central Bank;
- the inflation targeting supports on raising political transparency, procedural openness and monetary policy disclosures, but it harms economic (on 20.7 p.p.) and operational transparency (on  $4.7 \cdot 10^{-36}$  respectively);
- foreign exchange rate volatility will make the Central Bank to become more hidden in disclosure economic indicators forecast on 2.67 %, Board Meeting decisions voting details (4.8 %) and the monetary policy reports will be less frequent published with vanishing probability  $-2.29 \cdot 10^{-35}$ . But strong results were demon-

strated by procedural and monetary transparency on increasing ones' probability of 13.87 and 2.87 % respectively.

Thus, in time of high volatility of financial shocks in place of foreign exchange rate rising magnitude of volatility the monetary framework and instruments through which Central Bank makes influence is delivered to publicity with the aim to bring a correct sign to the market and meet economic agents' expectations.

For new economies panel, which includes Poland, Czech Republic, Hungary, Slovakia, Georgia, we have next results. First, the implicit anchor raises chances on 49 % to greater economic openness, reduces probability ratio of political disclosure on  $7.3 \cdot 10^{-11}$ , nearly on a half increases the procedural transparency and information releasing on monetary instrument changes, then monetary policy goals projecting disclosure will become more hidden due on 3.9 % and operational transparency on adjusting set goals errors deteriorates on 269.7 % or nearly in 3 times.

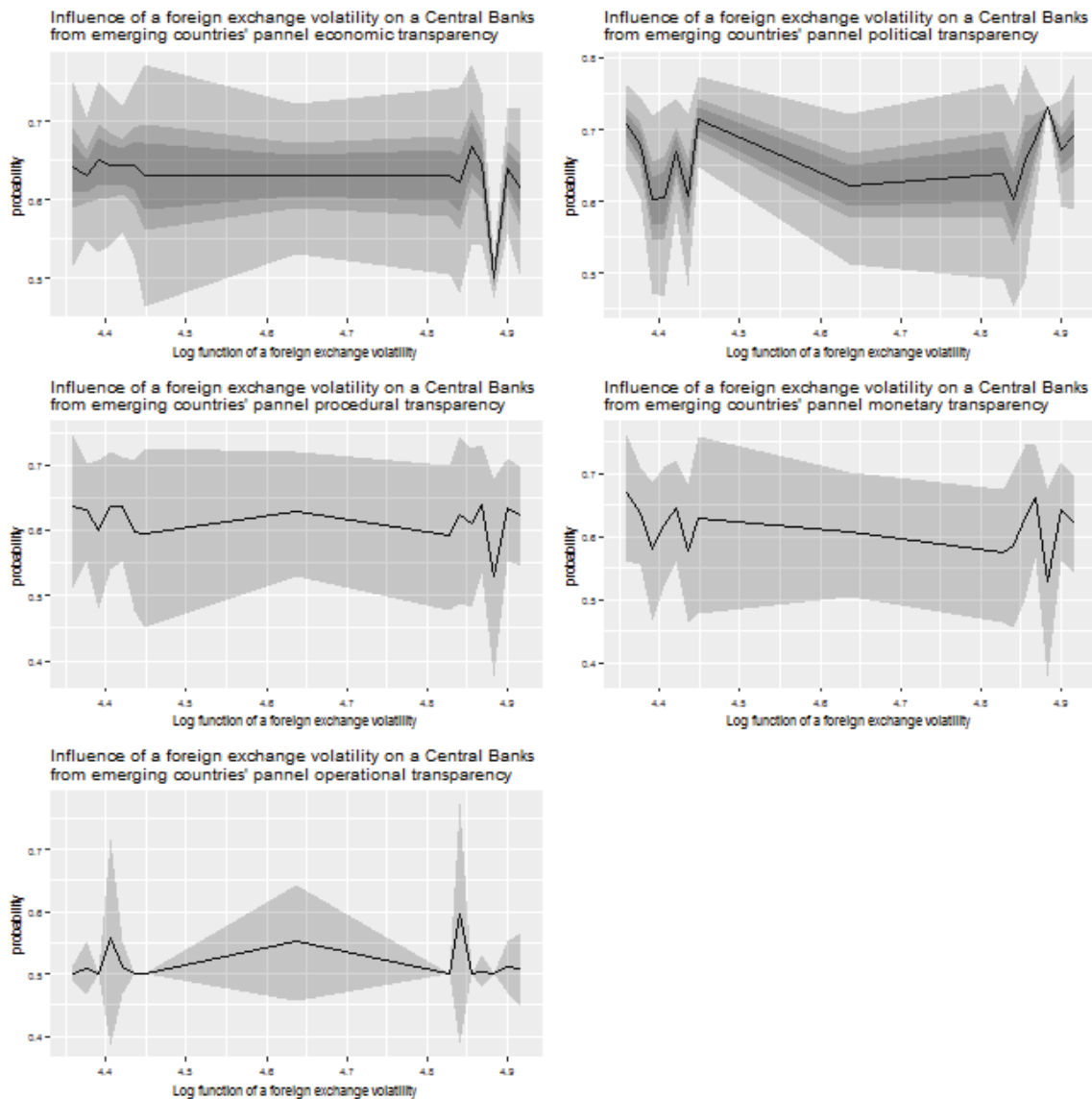


Fig. Probability distribution of Central Bank transparency regardingly foreign exchange volatility in emerging countries

Source: build on author's estimations



Inflation targeting for these countries bring benefits in a way of modestly increasing political transparency (see on fig.1) and operational transparency, which underlies behind the logic that setting new goal on inflation on each Board Meeting must deliver to community clear message on new objectives and shocks, that will jeopardize to meet it. This explanation will give reasons, why previous targeted range of macro indicators weren't achieved.

Foreign exchange volatility only increases probability ratio for economic transparency, political openness, slightly on procedural open access information availability. But monetary policy framework setting will become more hidden with probability on 97.8 % and operational transparency also less plausible (probability level — 99.8).

For Ukraine, we simulate results on basis of multi-panel approach and get next summarization. Under current foreign arrangement and monetary policy regime of flexible floating of legal tender and other targeting regime (de-jure NBU declared as inflation targeting) we have more hidden policy under 4.4 of nominal effective exchange rate devaluation (further — neer) and more open in time of 1.7 % appreciation. In publishing results of Board Meetings, Central Bank becomes more hidden, when depreciation cost was 16.9 % and more transparent, while devaluation rate wasn't exceeded 2.8 % of neer. The likelihood of open commenting on size of using of each monetary policy instrument becomes more probable under volatility of hryvnia at a magnitude of 4.3 of natural log and fewer chances arise, if volatility becomes almost 5 in log terms or 104.4 %. The monetary policy setting objectives process will be under the shadow of secrecy from publicity, when magnitude of volatility exceeds the 4.71 in log terms or 1.7% of price change and terms of trade fluctuation. For disclosing monetary policy framework even modest, vanish change in foreign exchange rate becomes crucial.

Reporting on a level of meeting assigned goals be NBU increases on 21.5 % even if fluctuation exceeds 4.4 %, but it may be explained by the fact, that in time of inflation

pressure the NBU provides more restricted policy aimed to provide clear nominal objective, which is attainable.

Although we obtain positive results for Ukraine: very robust effect on monetary policy announces the inflation targeting even implemented under de-jure status is demonstrated in Ukraine under volatility pressure on 10.5 %, political details disclosure probability enhances to 36 % and regularity of economic forecasting adjustment informing rises to 52.9 % and that's why is forming stable expectations of economic agents.

**Concluding remarks.** Obtained outcomes on advanced countries regulators, including European Central Banking System, CEE countries and including into the model two transitive new economies such as Georgia and Ukraine lead us to next summarization, that under threat of risen financial variables volatility, lack of trust of economic agents to pursuing by regulator monetary policy of accomplishing key target, the task of committing price stability mandate becomes increasingly impossible. In recent years, the economic transparency role has significantly increased for open economies, especially transitive as Ukraine is to be today. Political openness is still under threat of foreign exchange volatility and peak periods of instability encouraged regulator to hide details of decision making process. The procedural openness slightly depends on committing implicit target, but at the other side promotes under foreign exchange rate instability and rising inflation target level. The vulnerability of financial and money market causes the more hiddenness of forecast reporting. Also, we obtain positive results for Ukraine: very robust effect on monetary policy announces the inflation targeting is demonstrated in Ukraine under volatility pressure on 10.5 %, political details disclosure probability enhances to 36 % and regularity of economic forecasting adjustment informing rises to 52.9 % and that's why is forming stable expectations of economic agents. Monetary policy transparency with explicit foreign exchange rule and clear mandate of maintaining price stability lead to strong positive attitude from economic agents.

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