

Piotr Boguszewski/Department of Economic Analysis

When and Why Executive Opinion Surveys (EOS) could be informative for central banks?

Atlanta / November 2017

8th Annual Conference for Central Bank Business Surveys and Liaison Programs

The views expressed in this presentation are exclusively those of its author and do not necessarily reflect those of the National Bank of Poland

Contents

1	Preliminaries
2	EOS – concept and some methodological issues
3	Examples of usefulness of EOS dataset
4	Conclusions

NBP Narodowy Bank Polski

Preliminaries

Motivation and the scope of presentation ^{1/}

- In the standard approach (esp. in short-run perspective, narrow concept of competitiveness) inflation undermines competitiveness but...
- In era of globalization competitiveness of an open national economy with a flexible exchange rate regime is among solid "protectors" against the threat of inflation:
 - Smoother reactions to shocks
 - LOP mechanisms are working more efficiently – smaller rigidities and asymmetries
 - Participation in the stream of global (unconstrained) supply – some guard against demand-pull inflation
 - Innovations shield against costpush forces
- Holistic concept of competitiveness in Global Competitiveness Report (GCR)
 – 12 pillars of competitiveness:

- Attractive from the perspective of monetary policy and other tasks of CBs – in medium and longer terms
- Important for MTMs
- GCR is based on Economic Opinion Survey Questionnaire (EOS):
 - Such approach could be very advantageous for CBs
 - But there are no rose without thorns...
- The aim of presentation is to outline:
 - Backgrounds of GCR/EOS
 - Potential benefits for CBs
 - Some traps and problems implementation of this methodology brings about
- Practical point of view over 9 years' experience of NBP

^{1/} I would like to express my gratitude to Ms. Dorota Mirowska-Wierzbicka from NBP for valuable comments

NBP Narodowy Bank Polski

EOS – concept and some methodological issues

Executive Opinion Survey (EOS) – general view

- Survey administered by the World Economic Forum
- The goal fundamental ingredient of Global Competitiveness Index (GCI) and of the ranking based on this index (see: Global Competitiveness Report GCR):
 - This index is based on "hard data", founded on quantitative variables (macro and social statistics), and qualitative assessment extracted from EOS
 - The role of EOS in GCI differs across pillars of competitiveness (see Fig. 1)
- Approx. 140 countries and 14 000 firms included
- The Questionnaire consists of approx. 170 questions, mainly based on seven-grade Likert scale, and some basic characteristics of respondents and firms (employment, sector, ownership etc.)



Fig. 1 Impact of EOS on GCI across 12 pillars of competitiveness. Poland - EOS2017

Source: Own calculation on EOS and GCR data

Executive Opinion Survey (EOS) – general view (cont.)

- Areas of interest:
 - Most problematic factors for doing business
 - Infrastructure
 - Technology
 - Financial Environment
 - Foreign Trade and Investment
 - Domestic Competition
 - Business Operations and Innovations
 - Security
 - Governance
 - Education and Human Capital
 - Health
 - Travel and Tourism
 - Environment
 - Global Risks of concern for doing business

- Most of them relevant to CBs tasks and mission:
 - Potential output
 - Exchange rates
 - Risk premia
 - Financial development and stability
 - MTM, price competition and stability
- Panel structure of data, multinational character and relatively long history of observations (since 2007) – sources of additional strength

EOS samples – basic terms and conditions

Fixed requirements:

- Number of respondents: > = 80 respondents by country
- The sectoral composition of the sample – should reflect the structure of the whole national economy (in terms of contribution of Industry /manufacturing, nonmanufacturing/, Services, Agriculture)
- TOP 5 respondents must hold the position of Chief Executive Officer
- Samples should be composed of SMEs and Large companies in proportions *a priori* imposed by WEF
- Exclusion of firms belonging to government agencies/ministries

- Questionnaires should be collected between the end of February and the end of April (predefined span)
- Adequate regional representation

Altered terms:

- Methods of sample collection:
 - Random sample up to 2016
 - Undefined/unrestricted since 2016
- Definition of Large companies and SMEs and targeted structure:
 - 20-500 (SME 1/2) and >500 (Large – 1/2): up to 2016
 - 10-250 (SME 1/3) and >250 (Large – 1/3) and <10 (Micro – 1/3): in 2017
 - 20-250 (SME min. 1/3) and >250 (Large – min. 1/3) and the rest of the sample unconstrained: in 2018

EOS samples - basic terms and conditions (cont.)



Fig. 2 Structure of Partner Institutions of WEF - GCR 2017

Source: Own calculation on GCR 2017 data

It is extremely difficult to meet all this requirements

- Semi-panel: ½ of the panel consists of respondents participating in the previous edition of EOS
- Some personal data about respondents are collected (name and position within the firm)
- EOS is conducted by socalled Partner Institutions of WEF (PI)
- Two potential side-effects of such structure of PIs:
 - Some of them could be nonneutral (Governmental Agencies)
 - Some of them could be helpless or ineffective in obtaining Top 5 respondents (Institutes, Universities)
- Optimal position of Central Banks

Weaknesses of EOS samples – global perspective



Fig. 3 Main characteristics of the distribution of dynamics (y/y) of EOS samples – across countries

Source: Own calculation on EOS data



Fig. 4 Main characteristics of the distribution of the size of EOS population – across countries

- In the case of more than 25% of countries quality of the EOS samples below requirements (>80 firms). It holds in all years.
- For more than 25% of participants samples not stable over time. In some years (esp. 2017) visible reduction in sample size.
- In 2017 significant divergence between weighted and unweighted means. It points to problems with control over bigger samples.

Narodowy Bank Polski

Weaknesses of EOS samples – global perspective (cont.)



Fig. 5 Size and dynamics (y/y) of EOS2017 samples. Data order reflects country's position in GCR2017-18 ranking

Source: Own calculation on EOS data

- At the disaggregated level we additionally see (in 2017):
 - Reduction of the sample size in most countries
 - It is mirrored by a huge increase in sample size in a few cases
 - Substantial reductions in some countries from the top of GCR ranking (even close to 50% y/y)
 - In the case of Poland's predecessors – reductions dominate
- Question about causes of this situation – still open:
 - Effect of methodological changes in 2017 – barrier will vanish in the future
 - EOS is too complicated from the point of view of respondents – as a matter of fact
 - EOS is too expensive/time consuming for some Partner Institutions

Efficiency of the NBP approach

- EOS data collection very effective in the case of Poland:
 - Since 2009 the process based on convenient sample methodology
 - Size of the sample stable over time (yearly examination of 200–206 companies)
 - Each year the structure of sample reflects all WEF requirements
 - Punctuality all Polish firms surveyed during March and April (lateness – data collected up to June 2017 – in the case of some countries)
 - Top 5 most demanding requirement fulfilled in all classes of enterprises. It is extremely difficult in the case of bigger and the biggest companies – "how to reach and talk to the Boss?"
- Properties (esp. composition and size) of our sample are not negatively affected by changes in WEF methodology

- Poland has one of the biggest sample within this list – we are at the 7th "position":
 - Representativeness in many dimensions (size, sectoral, regional)
- EOS acquisition process works as a part of NBP non-financial firms monitoring system. Benefits of such solution manifest in:
 - Active role of NBP branches and fundamental – in data collection
 - Reasonable costs of the process of data collection
 - Professional assistance to respondents
 - Rich dataset ("general population") of potential EOS participants

Efficiency of the NBP approach (cont.)

Table 1. Top 5 respondents in different classes (%)

CATEGORY	HEAD OF BUSINESS UNIT	SENIOR EXECUTIVE BOARD MEMBER	TOP EXECUTIVE, OWNER	TOTAL
BIG	2.9	63.8	11.6	78.3
SME	1.2	38.6	43.4	83.1
MICRO	0.0	11.5	78.7	90.2
STATE-OWNED		53.1	18.8	71.9
DOMESTIC-PRIVATE	0.8	27.5	61.8	90.1
FOREIGN-OWNED	4.2	60.4	10.4	75.0
MANUFACTURING	2.4	40.5	40.5	83.3
NON- MANUFACTURING		37.0	48.1	85.2
SERVICES	1.5	37.2	44.5	83.2
AGRICULTURE	0.0	71.4	14.3	85.7

- Main advantages:
 - Top 5 requirement satisfied perfectly in all groups
 - Process of data collection concentrated and within imposed frames
 - High quality of responses: very high level of questionnaires' completeness



Narodowy Bank Polski

timing (upper graph) and completeness

Impact of sample composition on GCI – the case of Poland



SIGNIFICANCE OF DIFFERENCES (PSEUDO_GCI)



Fig. 7 Pseudo-GCI in Poland (2017) – analysis of variance

Source: Own calculation on EOS data

 Significant difference between BIG and MICRO firms

- In Poland smaller firms are more pessimistic: mean scores (µ_i) obtained by Big companies are the greatest for 60% of EOS questions (125 questions), SMEs dominate in 32% of questions and Micro firms – in the case of 18% of questions
- Polish sample fully reflects imposed structure (1/3,1/3,1/3)
 - For many forerunning countries (Poland's predecessors in this ranking) striking falls of the samples size
 - It could point to the higher probability of departure from imposed structure of sample
 - If it means deviation toward underrepresentation of Micro firms in such samples – GCI for Poland is underestimated in comparison with some "forerunners" and our position in this ranking is not fully justified (should be better than it is)

Impact of sample composition on GCI – the case of Poland (cont.)



Fig. 8 Rankings and indexes (GCI) – some peculiarities Source: Own calculation on EOS data

Definition of critical increment: $d = \min\left\{ w : \forall j \ GCI_{t+1}^{j} \ge \left(GCI_{t}^{j} + w \right) \rightarrow R_{t+1}^{j} < R_{t}^{j} \right\}$

- In 2017 the value of critical increment was close to 0.06
- In the light of last GCR Poland's position in ranking deteriorated (by 3 places) despite improvement in GCI score (in 0.03). This increment is smaller than the critical one, but in 2017 only one more country was in the same situation (similar change of GCI and the dropping position in the ranking)
- Probably, it could be partly explained by some distortions in sample structure of Poland's predecessors

NBP Narodowy Bank Polski

Examples of usefulness of EOS dataset: general assessment of financial system, credit rationing

EOS individual data – advantages and limitations

- Main benefits (in case of Poland):
 - Data collected by independent institution – central bank is not a stakeholder for non-financial enterprises
 - Financial data acquired very professionally (by central bank)
 - Since 2009 data gathered by the same "collector" – we have pooled cross-sectional sample
 - The sample representative in many dimensions
 - In 2015 and 2016 we had semipanel data
- Limitations:
 - Many questions starts with "In your country…" – this is an individual opinion on a country as a whole /generalization rather than on a specific enterprise

- ...but in many cases general opinions reflect individual experiences
- EOS questionnaires are not fixed since 2009 (but some questions remain unchanged)
- The questionnaire is very complex and extensive
- Since 2009 some essential changes in methodology imposed by WEF: different classification of firm's size, different sampling procedures etc.
- In Poland since the beginning fixed sampling procedure (convenient sample)
- Despite these disadvantages dataset with individual opinions valuable:
 - But some results should be interpreted cautiously

EOS2017 – section "Financial Environment" (subjects covered)

SECTOR

Table 2. Contents of the Section V (EOS) and scope of questions - classification

CODE QUESTION Q504 In your country, how easy is it for businesses to obtain a bank loan? In your country, to what extent does the cost of financial services (e.g., insurance, loans, trade Q501 Q501 finance) impede business activity? In your country, to what extent can small- and medium-sized enterprises (SMEs) access finance they need for their business operations through the Q510 financial sector? Q505 obtain equity funding? In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital sector provide the products and services that meet Q502 In your country, to what extent does the financial sector provide the products and services that meet UNULLOUND Q503 banks? In your country, to what extent does the financial sector provide the products and services that meet Q503 banks? Q507 the stability of the financial sector? In your country, to what extent do regulators ensure Q508 Q508 reporting standards? In your country, to what extent are the interests of In your country, to what extent are the interests of Q509 minority shareholders protected by the legal system?				
STUDY In your country, how easy is it for businesses to obtain a bank loan? In your country, to what extent does the cost of financial services (e.g., insurance, loans, trade Q501 In your country, to what extent does the cost of financial services (e.g., insurance, loans, trade Q501 In your country, to what extent can small- and medium-sized enterprises (SMEs) access finance they need for their business operations through the Q510 In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding? In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital sector provide the products and services that meet Q502 In your country, to what extent does the financial sector? In your country, to what extent does the financial sector? Q503 In your country, how do you assess the soundness of Dashs? In your country, to what extent do regulators ensure Q507 In your country, how strong are financial auditing and reporting standards? Q508 In your country, to what extent are the interests of minority shareholders protected by the legal system? In your country, to what extent are the interests of minority shareholders protected by the legal system?		CODE	QUESTION	
SUNPUS In your country, to what extent does the cost of financial services (e.g., insurance, loans, trade gamma financial services (e.g., insurance, loans, trade financial services (e.g., insurance, loans, trade gamma financial services (e.g., insurance, loans, trade gamma financial services (SMEs) access finance they need for their business operations through the gamma gamma financial sector? In your country, to what extent can small- and medium-sized enterprises (SMEs) access finance they need for their business operations through the gamma ga		Q504	In your country, how easy is it for businesses to obtain a bank loan?	
VIPUSUOUTING In your country, to what extent can small- and medium-sized enterprises (SMEs) access finance they need for their business operations through the financial sector? In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding? In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital sector provide the products and services that meet Q502 In your country, to what extent does the financial sector provide the products and services that meet Q502 In your country, how do you assess the soundness of banks? In your country, to what extent do regulators ensure In your country, to what extent do regulators ensure Q507 In your country, how strong are financial auditing and reporting standards? In your country, to what extent are the interests of minority shareholders protected by the legal system?	AINTS	Q501	In your country, to what extent does the cost of financial services (e.g., insurance, loans, trade finance) impede business activity?	ŊŊ
OPUONUL In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding? In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital market? Q506 market? In your country, to what extent does the financial sector provide the products and services that meet Q502 In your country, how do you assess the soundness of banks? Q503 In your country, to what extent do regulators ensure the stability of the financial sector? In your country, how strong are financial auditing and reporting standards? Q509 In your country, to what extent are the interests of minority shareholders protected by the legal system?	ONSTRAIN	Q510	In your country, to what extent can small- and medium-sized enterprises (SMEs) access finance they need for their business operations through the financial sector?	RATION
VINIT In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital market? In your country, to what extent does the financial sector provide the products and services that meet In your country, to what extent does the financial sector provide the products and services that meet In your country, to what extent does the financial sector provide the products and services that meet In your country, to what extent does the financial sector In your country, to what extent do regulators ensure In your country, to what extent do regulators ensure In your country, how strong are financial auditing and reporting standards? In your country, to what extent are the interests of minority shareholders protected by the legal system? In your country, to what extent are the interests of minority shareholders protected by the legal system?	ICIAL CO	Q505	In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding?	
In your country, to what extent does the financial sector provide the products and services that meet the needs of businesses? In your country, to what extent does the financial sector provide the products and services that meet the needs of businesses? In your country, how do you assess the soundness of banks? In your country, how do you assess the soundness of banks? Q503 banks? In your country, to what extent do regulators ensure Q507 In your country, how strong are financial auditing and reporting standards? In your country, to what extent are the interests of minority shareholders protected by the legal system?	FINAN	Q506	In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital market?	IAL
SUNCE SU		Q502	In your country, to what extent does the financial sector provide the products and services that meet the needs of businesses?	FINANC
NoteIn your country, how do you assess the soundness of banks?In your country, to what extent do regulators ensure the stability of the financial sector?In your country, to what extent do regulators ensure the stability of the financial sector?NON N				Ч
In your country, to what extent do regulators ensureQ507Un your country, to what extent do regulators ensureQ507In your country, how strong are financial auditing andQ508In your country, to what extent are the interests ofQ509In your country, to what extent are the interests ofIn your country, to what extent are the interests ofIn your country, to what extent are the interests ofIn your country, to what extent are the interests ofIn your country, to what extent are the legal system?	Ś	Q503	In your country, how do you assess the soundness of banks?	ENT
UniversityIn your country, how strong are financial auditing and reporting standards?UniversityIn your country, to what extent are the interests of minority shareholders protected by the legal system?	NES:	Q507	In your country, to what extent do regulators ensure the stability of the financial sector?	MHO.
In your country, to what extent are the interests of minority shareholders protected by the legal system?	STAB	Q508	In your country, how strong are financial auditing and reporting standards?	EVEL
	S S	Q509	In your country, to what extent are the interests of minority shareholders protected by the legal system?	Δ

Source: List based on EOS questionnaire

- EOS2017 contains ten questions exclusively devoted to the problems of financial environment
- In EOS we have many supporting questions in this respect:
 - On competition
 - On business sophistication
 - On attitude toward risk
- This gives space for relatively complex and rich analysis of issues central banks could be interested in:
 - Access to credit/rationing
 - Soundness of financial system
 - Level of development of this system

Assessments of financial system in Poland - typology

QUESTIONS (L.S.): Q501

Q502

Q503

Q504

Q505

Q506 Q507

Q508 Q509

Q510

Table. 2 Mean scores in clusters in different classes of companies

017E	CLUSTERS:							
SIZE	1	2	3	4	5	6		
BIG	4,0	5,9	32,4	19,4	6,7	31,6		
SME	5,3	14,1	25,4	27,6	9,1	18,5		
MICRO	4,9	24,6	23,0	19,7	16,4	11,5		

- Clustering procedure yields classification presented on Fig. 9:
 - "Higher" clusters better overall assessment
 - Small ratio of the worst opinions - ~5% of the sample
 - Domination of moderate views/attitudes – clusters 3 and 4
 - Different distributions in classes of "firms' size" best opinions in Big firms and the worst in Micro



Fig. 9 Composition of clusters, total scores (r.s.) and the frequency of the occurrence (l.s.) in whole population

Source: Own calculation on EOS data

Path analysis of EOS – relations between latent variables



MANIFEST VARIABLES:

5.01 – costs of financial services as a business impediment 5.02 - adequacy of financial products to the business needs 5.03 – soundness of banks (assessments) 5.04 - bank loans' availability 5.05 - venture capital for start-ups 5.06 – abundance of equity market 5.07 - stability of financial sector 5.08 - quality of reporting and auditing standards 5.09 – protection of minority shareholders 5.10 - SMEs access to finance

 Correlation between BUD.CO. and QUAL. significant and negative (all manifest variables are expressed as stimulants) This result indicates "the bias" in such surveys – enterprises tend to overvalue the soundness and quality of financial sector if the policy of this sector is more favorable for firms

Rationing – synergy of individual and aggregate data

100

QUESTION: 5.04 In your country, how easy is it for businesses to obtain a bank loan?

SIZE	N	SUM	EXPECTED BELOW H0	STD. BELOW H0	MEAN
MICRO	61	28.750	30.354	2.902	0.471
SME	79	36.955	39.311	3.095	0.467
BIG	69	38.294	34.334	3.002	0.554



EOS data

90 III 80 IV 70 V POLAND (43) (THE BEST=100) 60 50 DTF 40 VIII 30 IX 20 10 Х 0 20 60 100 140 40 120 80 RANK

Fig.10 Availability of loans in 2017 – Distance to Frontier (DTF)

Source: Own calculation on GCR data

0.42

Pr. > chi-2

Synergy of individual and aggregate data (cont.)



Fig. 11 Ease of access to loans in Poland: position in GCR rankings in 2006-2017 (left) and DTF against some post-socialist countries in 2017 (right)

Source: Own calculation on EOS data

- Small differences between groups is insufficient condition of the absence of credit rationing or similar barriers/problems with access to loans
- Such hypothesis is supported by aggregate data (Fig.11):
 - Poland has been going up in ranking (since 2013)
 - Poland belongs to the leaders within the group of post-socialist countries

Narodowy Bank Polski

Financing and projects with elevated risk

- In EOS we have at least one question directly pointing to this problem:
 - Barriers to equity funding of risky projects
 - ...and some clues could be obtained indirectly – by combination of specific questions
- Problem with venture capital financing is common for majority of clusters of respondents – "thin contribution" of Q505 except for clusters 5th and 6th (see Fig. 9)
- Combination of questions about the strength of impediments to the access to venture capital (Q505) and costs of financial services as a barrier (Q501):

Table 3. Contingencies between Q505 and Q501 (upper panel) and Q504 (lower panel)

Ϋ́	0505	Q501: impedes business> no obstacles						
tre • ex	Q303	1	2	3	4	5	6	7
me	1	15,6	24,7	27,3	9,1	10,4	13,0	0,0
me me	2	0,5	23,7	33,6	18,5	14,7	7,1	1,9
ly a	3	2,0	8,1	27,0	23,0	27,0	11,5	1,4
icu eas	4	1,9	1,0	15,4	31,7	31,7	17,3	1,0
₹. -	5		2,4	14,6	17,1	34,1	29,3	2,4
	1 0505							
Ϋ́	0505	Q504	: extre	mely di	fficult	> exti	remely e	easy
Extre > e)	Q505	Q504 1	: extre 2	mely d i 3	fficult 4	• > ext ı 5	remely of 6	easy 7
Extreme > extre	Q505 1	Q504 1 7,6	2 2 25,3	mely di 3 <mark>26,6</mark>	fficult 4 27,8	• > exti 5 10,1	remely 6 6 2,5	easy 7
Extremely > extreme	Q505 1 2	Q504 1 7,6 1,9	2 2 25,3 14,8	mely di 3 26,6 25,0	fficult 4 27,8 31,0	► extinut 5 10,1 19,9	remely 6 6 2,5 6,9	easy 7 0,5
Extremely diff > extremely	Q505 1 2 3	Q504 1 7,6 1,9	2 25,3 14,8 4,0	mely di 3 26,6 25,0 13,3	fficult 4 27,8 31,0 40,0	• exti 5 10,1 19,9 34,0	remely 6 6 2,5 6,9 8,0	easy 7 0,5 0,7
Extremely difficu	Q505 1 2 3 4	Q504 1 7,6 1,9	2 25,3 14,8 4,0 1,8	mely di 3 26,6 25,0 13,3 0,9	fficult 4 27,8 31,0 40,0 25,7	• extr 5 10,1 19,9 34,0 51,4	remely 6 6 2,5 6,9 8,0 19,3	easy 7 0,5 0,7 0,9

Source: Own calculation on EOS data

- Pearson/Spearman correlations 0.36/0.37
- Table 3 confirms the rule higher risk premium on more risky projects
- For Q505 * Q504 we see even higher and high Pearson/Spearman correlations – 0.49/0.48:
 - It is possible to obtain credit for riskier projects – there are no strong forms of "no-price" rationing

NBP Narodowy Bank Polski

IV

Conclusions

Final remarks

- GCR is a valuable source of multinational information about competitiveness - in many aspects
- GCR and/or EOS are explicitly or implicitly interpreted by many central banks
- Possible impact of these assessments on:
 - Countries ratings
 - Investors' sentiment, DFI etc.
 - Risk premiums
- After methodological shocks results of GCR should be interpreted carefully
- Some benefits for Partner Institutions of WEF:
 - Access to country's EOS individual data

- Access to full GCR dataset all variables, rankings etc. – at countries levels
- "Time premium" access to text of GCR and GCR dataset prior to the official launch of GCR
- All these advantages could be useful for CBs:
 - Privileged interpreter
 - Deeper analysis of GCR
 - Individual and disaggregated data could be beneficial for some investigations CBs are directly involved in: financial stability, credit rationing/access, factors influencing potential output etc.

We protect the value of money

NBP Narodowy Bank Polski

www.nbp.pl