

A revised and updated version of this working paper has been published by Taylor & Francis in [\*\*APPLIED ECONOMICS LETTERS\*\*](#). Please use the journal version only!



**L**odz  
**E**conomics  
**W**orking  
**P**apers



Credible enough? Forward  
guidance and perceived  
National Bank of Poland's  
policy rule



Paweł Baranowski  
Paweł Gajewski



2/2015



# Credible enough? Forward guidance and perceived National Bank of Poland's policy rule

---

Paweł Baranowski and Paweł Gajewski

Faculty of Economics and Sociology, University of Lodz

## ABSTRACT

Credible forward guidance should bring down the perceived impact of macroeconomic variables on the interest rate. Using a micro-level dataset we test the perception of monetary policy in Poland among professional forecasters and find evidence for forward guidance credibility.

**JEL:** E44, E52, E58.

**Keywords:** survey data, forward guidance, Taylor rule, expectations.

## 1. Introduction

Since its inception by the Reserve Bank of New Zealand in 1997, the constantly evolving forward guidance (FG) has been introduced by a number of central banks, with the aim of enhancing monetary policy effectiveness at or near the zero lower bound (ZLB). This policy trend has been supported by solid theoretical evidence (e.g. Eggertsson and Woodford, 2003, Nakov, 2008, Walsh, 2009). The general finding is that commitment to a future policy decisions can produce expansionary effects even at ZLB.

This being said, some identified limitations to the FG effectiveness are found to stem from the inherent time inconsistency, insufficient message clarity or its improper interpretation, deficient central bank credibility, as well as inadequate length of the commitment<sup>1</sup> (see: Filardo and Hofmann, 2014, for a comprehensive documentation of forward guidance from both theoretical and empirical standpoints).

The current letter provides a preliminary evidence on the FG credibility in Poland by investigating changes in the professional forecasters' perceived ex-ante monetary policy rule, associated with introducing FG. Our empirical exercise is performed in the spirit of Mitchell and Pearce (2010) and Carvalho and Nechio (2014), that use microdata and consider survey of professional forecasters or households. These papers, however, focus on conventional monetary policy and abstract from FG related policy rule changes. To our knowledge this letter is the first insight into FG credibility using individual data on professional forecasters.

The case of NBP is interesting as the introduction of the FG has not been accompanied by the ZLB. Consequently, classical monetary rule should hold till the introduction of FG.

While the credibility issue (emphasized e.g. Bodenstein et al., 2012 and Dennis, 2014) was perhaps less of a concern for the monetary authorities such as Fed or ECB (although controversies over its implementations and conduct can be recalled for), it was central for some followers, with no decades-long track of the stabilizing monetary policy and firmly anchored inflation expectations. The National Bank of Poland (NBP) could be regarded a good example of an institution, for which forward guidance was a credibility test.

---

<sup>1</sup> The longer is the time horizon applied, the more difficult it is to secure the forward guidance integrity.

From early 1990s, NBP was first preoccupied with combating hyperinflation, pursuing money supply targeting and stabilizing the exchange rate under crawling peg. On top of this, full goal and instrument independence was secured only in 1997 and headline inflation indices were running at double digits by the end of 1990s.

The NBP introduced forward guidance in July 2013, less than thirteen years after bringing inflation rate to single digits and nine years after adopting the ongoing 2.5% inflation target. The FG was preceded by trimming official interest rates to historical lows, even though ZLB was not a policy problem at that time. Nevertheless, the construction of this tool in Poland was rather conservative: official interest rates were to be kept unconditionally unchanged over a relatively short period of six months, which was subsequently extended to one year and ended in June 2014. While the design of the FG was prudent, main risks were associated with the potential fragility of institutional credibility, which was indeed acknowledged by the NBP (Belka, 2014).

## **2. Data**

We use individual data collected on quarterly basis under National Bank of Poland Survey of Professional Forecasters. The NBP-SPF dataset contains information on expectations formed at the end of quarter for the 4 and 8 quarters ahead horizon as well as the average annual for the current and next year. The forecasters are asked on their point forecasts of CPI, GDP growth (which here serves as a proxy for output gap) and a number of additional variables (including central bank's interest rate). All the variables are expressed in annual terms.

After omitting observations with missing interest rate forecasts, the data form unbalanced panel consisting of 240 observations (37 forecasters over the period from 2011 Q3 to 2014 Q2).

Tables 1 and 2 provide descriptive statistics for the full estimation sample (i.e. if all the data used for estimation was reported to the survey).

Tab. 1 SPF descriptive statistics, 4 quarter-ahead horizon.

Quarter	CPI(t+4)				ΔGDP(t+4)				REPO(t+4)			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
2011Q3	2.93	0.30	2.40	3.30	3.28	0.52	2.00	3.90	4.24	0.27	3.75	4.75
2011Q4	3.22	0.58	2.30	4.50	2.95	0.57	2.00	4.10	4.18	0.31	3.50	4.50
2012Q1	2.89	0.50	1.70	3.80	2.65	0.49	1.90	3.40	4.27	0.22	3.90	4.50
2012Q2	2.90	0.42	2.10	3.50	2.59	0.59	1.50	3.60	4.52	0.25	3.86	4.75
2012Q3	2.78	0.39	2.20	3.80	2.25	0.42	1.70	3.80	4.00	0.24	3.50	4.50
2012Q4	2.40	0.35	1.80	3.00	2.13	0.44	1.20	2.70	3.52	0.21	3.00	3.75
2013Q1	2.02	0.30	1.20	2.50	2.25	0.44	1.60	3.30	3.16	0.16	2.75	3.38
2013Q2	2.00	0.43	1.30	3.00	2.28	0.45	1.50	3.20	2.61	0.23	2.50	3.50
2013Q3	1.99	0.42	1.00	2.80	2.69	0.38	2.00	3.50	2.68	0.20	2.50	3.00
2013Q4	1.98	0.27	1.25	2.30	3.20	0.26	2.80	4.00	2.73	0.18	2.50	3.00
2014Q1	2.03	0.26	1.50	2.50	3.41	0.39	2.70	4.30	2.69	0.18	2.50	3.10
2014Q2	1.79	0.41	1.20	3.00	3.65	0.62	2.00	5.10	2.48	0.31	2.00	3.25

Tab. 2 SPF descriptive statistics, 8 quarter-ahead horizon.

Quarter	CPI(t+8)				ΔGDP(t+8)				REPO(t+8)			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
2011Q3	2.72	0.30	2.10	3.20	3.51	0.37	2.80	4.00	4.12	0.39	3.60	4.87
2011Q4	2.80	0.37	2.30	3.50	3.12	0.71	1.30	4.40	4.11	0.40	3.25	4.50
2012Q1	2.62	0.52	1.20	3.50	3.23	0.51	2.60	4.10	4.23	0.34	3.50	4.75
2012Q2	2.88	0.37	2.20	3.70	3.23	0.41	2.60	4.10	4.28	0.45	3.50	5.25
2012Q3	2.82	0.29	2.40	3.60	2.88	0.60	1.60	3.80	4.10	0.35	3.50	4.50
2012Q4	2.65	0.28	2.20	3.10	2.96	0.78	1.60	5.20	3.77	0.39	3.00	4.50
2013Q1	2.41	0.33	1.90	3.00	2.87	0.42	2.00	3.80	3.65	0.40	3.00	4.50
2013Q2	2.51	0.35	1.60	3.00	2.99	0.48	2.00	3.80	3.26	0.48	2.50	4.00
2013Q3	2.50	0.30	2.00	3.20	3.27	0.43	2.40	4.00	3.49	0.44	2.75	4.08
2013Q4	2.48	0.35	2.00	3.30	3.79	0.48	3.00	4.70	3.62	0.40	2.90	4.42
2014Q1	2.44	0.23	2.00	3.10	3.63	0.43	2.70	4.20	3.49	0.35	2.75	4.25
2014Q2	2.35	0.34	1.60	3.00	3.66	0.55	2.00	4.50	3.07	0.34	2.25	3.75

The statistics manifest a reasonable pattern. First, some co-movement of interest rate and inflation is observed. This is less visible when taking the REPO and GDP. Second, during the FG period some decrease of dispersion across the forecasters can be observed for the four-

quarter horizon, but not for the last quarter (which might indicate that the FG exit was to some amount expected).

### 3. Empirical model and results

We adapt the well established Taylor (1993) rule framework for modeling conventional monetary policy. Much of the literature has empirically analyzed Taylor rule using macroeconomic data, both for the developed economies (e.g. Clarida, Gali, Gertler, 1998) as well emerging ones (e.g. Caraiani, 2013). At the same time, Maria-Dolores (2005), Baranowski (2011) and Sznajderska (2014) show that the standard Taylor rule framework is well suited to mimic monetary policy in Poland. Thus, the following Taylor-type equation is estimated:

$$r_{j,t+n|t} = r_0 + \phi_\pi \pi_{j,t+m|t} + \phi_x x_{j,t+m|t} + \epsilon_{j,t}$$

where:  $r$  – nominal repo rate,  $\pi$  – CPI inflation,  $x$  – GDP dynamics (proxy for output gap),  $j$  denotes forecasts of  $j$ -th professional forecaster, formed at time  $t$  for the  $[n,m=4,8]$  – expectations horizons.

We therefore have two contemporaneous equations, comprising 4 and 8-quarter ahead relationships between expected interest rates and explanatory variables, and one forward-looking equation, where the 4-quarter ahead expected interest rate is driven by forward-looking information (i.e. further-ahead expectations of explanatory variables)

In order to capture the effect of introducing FG, the sample is split into two subsamples: 2011 Q3 to 2013 Q2 (non-FG) and from 2013 Q3 to 2014 Q2 (FG). We expect that in the non-FG period interest rate expectations are in line with the Taylor-type rule and the Taylor principle is satisfied. Then there are two possible scenarios for the FG period. The credible FG announcement should weaken the (perceived) reaction to inflation and output gap, while non-credibility of the FG would be associated with unaffected perceived interest rate rule.

Endogeneity of the explanatory variables as well as potential heteroskedasticity is addressed by applying GMM estimation method. The estimation results for the non-FG sample are presented in table 3<sup>2</sup>:

---

<sup>2</sup> As a robustness check we performed 2SLS estimation, where we obtained similar results (see Annex). Point estimates were also robust to different instrumental variable sets.

**Table 3. Estimation results – non FG period**

	(1) REPO (t+4)	(2) REPO (t+8)	(3) REPO (t+4)
CPI (t+4)	1.506*** (10.38)		
$\Delta$ GDP (t+4)	-0.249 (-1.14)		
CPI (t+8)		1.300*** (5.37)	2.322*** (7.00)
$\Delta$ GDP (t+8)		-0.00105 (-0.01)	-0.0672 (-0.27)
p (Hansen)	0.289	0.131	0.239
p (Kleibergen-Paap)	0.0000105	0.00000299	0.00000134
N	146	145	146

Notes:

Instruments (1): CPI,  $\Delta$ GDP (current-year and long-run forecasts)

Instruments (2,3): CPI,  $\Delta$ GDP (t+4, long-run forecasts)

These results show that professional forecasters perceived a reasonably strong monetary policy response to inflation, while GDP dynamics was, in their view, not taken into account while setting interest rates. These results are broadly in line with empirical evidence from the Taylor rule estimates for Poland presented by Maria-Dolores (2005) and the inflation coefficients satisfy the Taylor principle. Moreover, the coefficients are fairly similar regardless the forecast horizon of explanatory variables as long as both contemporaneous relationships are considered (columns 1 and 2). In the forward-looking equation (column 3), the inflation coefficient is higher, but GDP growth remains insignificant. Overall, these results indicate that the monetary policy had earned its credibility in stabilizing inflation before introducing FG.

Results for the FG sample are presented in table 4 and offer some interesting insights. First, when four-quarter ahead interest rate forecast was a dependent variable (columns 1 and 3), neither inflation nor GDP dynamics were perceived as its significant drivers. This is exactly a result we expected in the credible FG scenario. Second, when forming projections for the eight-quarters horizon, forecasters again started to expect some impact of inflation on interest rate since this horizon went beyond the announced FG period. While the Taylor principle is still not satisfied in this case, which might be explained by uncertainty related to the ultimate length of FG, the inflation coefficient moves towards the case of non-FG perceived rule.



**Table 4. Estimation results – FG period**

	(4) REPO (t+4)	(5) REPO (t+8)	(6) REPO (t+4)
CPI (t+4)	0.161 (0.90)		
$\Delta$ GDP (t+4)	-0.135 (-1.85)		
CPI (t+8)		0.883** (2.81)	0.379 (1.70)
$\Delta$ GDP (t+8)		0.0135 (0.09)	-0.0557 (-0.67)
p (Hansen)	0.216	0.208	0.631
p (Kleibergen-Paap)	0.00732	0.00207	0.00207
N	74	75	75

Notes: see table 3.

#### 4. Conclusions

Our results suggest that the FG in Poland was taken as fully credible by professional forecasters. While monetary policy was perceived to stabilize inflation (but not output) in the pre-FG period, neither inflation nor output gap developments are found to have affected expected interest rates during the FG period.

## References

- Baranowski P. (2011). Reguła polityki pieniężnej dla Polski-porównanie wyników różnych specyfikacji. „Oeconomia Copernicana”, 3, 5-21.
- Belka M. (2014). Economies need strong foundations, interview, obserwatorfinansowy.pl, 14 Mar. 2014.
- Bodenstein M., Hebden J., Nunes R. (2012). Imperfect credibility and the zero lower bound, “Journal of Monetary Economics”, 59(2), 135-149.
- Caraiani P. (2013). Comparing monetary policy rules in CEE economies: A Bayesian approach, “Economic Modelling”, 32, 233-246.
- Carvalho C., Fernanda Nechio (2014), Do people understand monetary policy?, “Journal of Monetary Economics”, 66, 108-123.
- Clarida R., Gali J., Gertler M. (1998), Monetary policy rules in practice. Some international evidence, “European Economic Review”, 42.
- Dennis R. (2014), Imperfect credibility and robust monetary policy, “Journal of Economic Dynamics and Control”, 44, 218–234
- Eggertsson G.B., Woodford M. (2003), The Zero Bound on Interest Rates and Optimal Monetary Policy, “Brookings Papers on Economic Activity”, 1.
- Maria-Dolores, R. (2005), Monetary Policy Rules In Accession Countries to EU: Is the Taylor rule a pattern?, “Economics Bulletin”, 5(7), 1-16.
- Mitchell K., Pearce D. K. (2010). Do wall street economists believe in Okun’s law and the Taylor rule?, “Journal of Economics and Finance”, 34(2), 196-217.
- Taylor J.B. (1993), Discretion Versus Policy Rules in Practice, Carnegie-Rochester Series on Public Policy, Vol. 39.
- Sznajderska A. (2014). Asymmetric effects in the Polish monetary policy rule, “Economic Modelling”, 36, 547-556.

## Annex: Robustness

In the Annex we present two stage LS estimation results, for the sake of robustness with respect to estimation method. The instruments were set as in the baseline GMM estimation.

**Table A1. 2SLS estimation results – non FG period**

	REPO (t+4)	REPO (t+8)	REPO (t+4)
INF_4	1.498*** (10.23)		
PKB_4	-0.244 (-1.10)		
INF_8		1.175*** (4.67)	2.082*** (5.66)
PKB_8		0.0750 (0.37)	0.0805 (0.29)

**Table A2. 2SLS estimation results – FG period**

	REPO (t+4)	REPO (t+8)	REPO (t+4)
CPI (t+4)	0.116 (0.64)		
$\Delta$ GDP (t+4)	-0.162* (-2.17)		
CPI (t+8)		0.863** (2.72)	0.326 (1.35)
$\Delta$ GDP (t+8)		-0.0397 (-0.26)	-0.0589 (-0.70)