

Do MPC voting records help predicting policy interest rate?

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July 2010

¹This study was financially supported by the Paderewski grant from the European Center Natolin. I would like to thank Clodomiro Ferreira, Ryszard Kokoszcyński, Małgorzata Krzak, Joanna Niedźwiedzińska, Zbigniew Polański, and Barbara Sładkowska. The paper has also benefited from the earlier study funded by the Global Development Network grant distributed by the Economics Education and Research Consortium.

"By making itself more predictable to the markets, the central bank makes market reactions to monetary policy more predictable to itself. And that makes it possible to do a better job of managing the economy."

- Alan S. Blinder, former Vice Chairman of the Board of Governors of the US Federal Reserve System

- Many academic economists and central banks' practitioners seem to agree nowadays that more transparent and predictable behavior of central bank itself improves the transmission and effectiveness of monetary policy.
- Over the past two decades most central banks, including NBP, have radically increased the public communication and disclosure of internal information on policymaking process.

MPC voting records

To publish or not to publish?

- However, there is no consensus on whether the voting records from policymaking meetings should be published. For instance, US Federal Reserve publish them within three weeks after each policy meeting, while European Central Bank does not publish them at all.
- The MPC of the Bank of England goes to great lengths to promote the transparency of its decisions. Since 1998 the minutes of the MPC meetings are published two weeks after the policy rate action. The minutes record the votes of the individual members of the Committee including the policy rate preferences of the dissenting members.

MPC voting records

To publish or not to publish?

- In contrast, the MPC of the NBP does not publish the minutes and voting records in its monthly press releases; instead, they are published in the Inflation Reports (recently, three times per year). Therefore, they become available for public only with up to five-month delay.
- Moreover, the available voting records do not provide complete information on the individual policy rate preferences. They contain the description of all propositions submitted for voting and the list of members who voted 'yes' and 'no' at each voting round. The preferred interest rate of a member who voted against the winning proposal is *not* generally recorded.
- The NBP does not disclose such information on request. Therefore, it is not always possible to infer with certainty the favoured interest rate of those members who disagreed with majority.

Bank of England

33 The Governor invited members of the Committee to vote on the proposition that the Bank's repo rate be increased by 25 basis points to 5.75%. Eight members of the Committee (the Governor, Mervyn King, David Clementi, Charles Goodhart, DeAnne Julius, Ian Plenderleith, John Vickers and Sushil Wadhvani) voted for the proposition. Willem Buiter voted against, preferring an increase of 50 basis points.

National Bank of Poland

MPC decision:

The MPC increased the level of all interest rates by 0.25 percentage point

Voting of the MPC members:

For:	J.Czekaj	Against:	S.Skrzypek
	D.Filar		
	S.Nieckarz		
	M.Noga		
	S.Owsiak		
	M.Pietrewicz		
	A.Sławiński		
	H.Wasilewska-Trenkner		
	A.Wojtyna		

- The empirical studies of monetary policy usually do not take into account the information containing in the available voting records. The literature is routinely focused on the final policy decisions, made in a majority vote, and closes the eyes to the information containing in the minority views.
- However, as Gerlach-Kristen (2004) showed the voting records of the MPC of the Bank of England are informative about future policy rate changes: dissenting views on the appropriate level of policy rate help forecast the next MPC decision.

- Could publication of MPC voting records within a month after each policy meeting improve predictability of the next policy rate decision of the NBP?
- What can be gained by taking into account the disagreement among MPC members while estimating policy rules?

Discreteness of policy rate

Historical changes to reference rate, percentage points													
Sample	-2.50	-1.50	-1.00	-0.75	-0.50	-0.25	0.00	0.25	0.50	1.00	1.50	2.50	All
1998/02-2004/01	2	6	6		6	7	40		1	2	1	1	72
2004/02-2009/12				2	3	8	47	9	2				71

Consolidated categories of reference rate changes						
	Large cut	Small cut	No change	Hike		All
1998/02-2004/01	20	7	40	5		72
2004/02-2009/12	5	8	47	11		71

To address the discreteness of dependent variable the paper employs an ordered probit approach, which forms a probabilistic forecast of discrete adjustments to the policy rate as a nonlinear function of explanatory variables.

$$\begin{aligned}\Pr(\Delta R_t = \text{"large cut"} | X_t) &= \Phi(\gamma_1 - X_t\beta) \\ \Pr(\Delta R_t = \text{"small cut"} | X_t) &= \Phi(\gamma_2 - X_t\beta) - \Phi(\gamma_1 - X_t\beta) \\ \Pr(\Delta R_t = \text{"no change"} | X_t) &= \Phi(\gamma_3 - X_t\beta) - \Phi(\gamma_2 - X_t\beta) \\ \Pr(\Delta R_t = \text{"hike"} | X_t) &= 1 - \Phi(\gamma_3 - X_t\beta)\end{aligned}$$

- The paper departs from a common practice of employing the quarterly or monthly data averages and uses instead more adequate sample construction. The sample observations are all policy-rate-setting MPC meetings. The dependent variable is a reference rate change made at each meeting. The data on the right-hand-side variables is taken as it was observed one day before the date of making policy decision, so it consists of already predetermined variables, which are independent of the rate setting at that MPC meeting.

Methodology

MPC meetings as a unit of observation

- The above data construction avoids the simultaneity problem, which can occur in modeling the systematic responses of policy rates' averages to economic variables' averages for a given month or quarter due to possible interactions between the policy rate and the other variables that can happen during a period of aggregation.
- Furthermore, this sample design mimics carefully the timing of policy decisions and availability of statistical data, and hence carefully simulates the actual policy-action-generating process.

- The latest versions of data commonly used in the empirical literature may differ from the real-time ones because of the revisions.
- To avoid the distortion of information the study uses the novel real-time data set, compiled and described in Sirchenko (2007)² and updated up to the end of 2009. This data set contains the historical time series truly available to the policymakers and public at each policy-decision-making MPC meeting during the period 1998 - 2009.

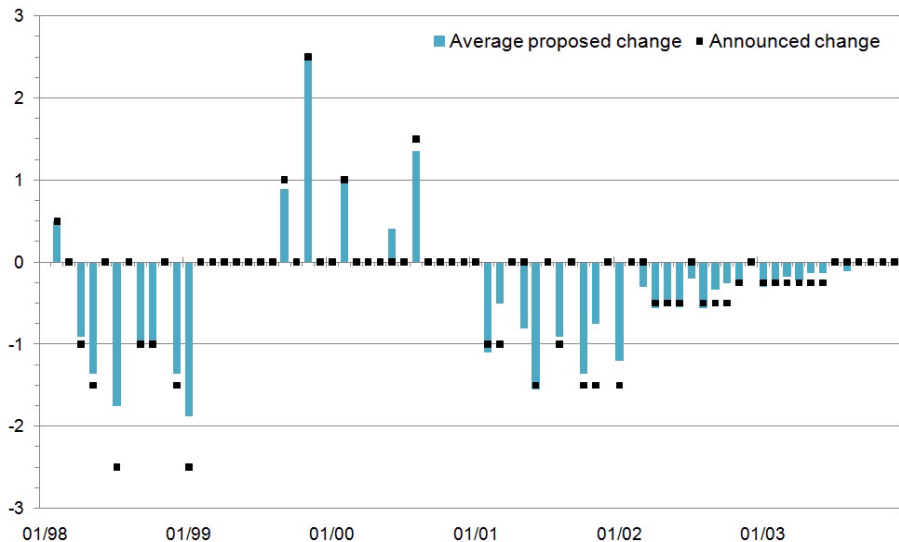
²Sirchenko, Andrei (2007), "Modelling monetary policy in real time: Does discreteness matter?", EERC Working Paper No. 08-07

- The available voting records do not provide complete information on the individual policy rate preferences.
- I assumed that the dissenting members favoured the status quo, i.e. no change to the rate, if no alternative proposal was submitted.
- In case when more than one proposition was put to vote on a meeting and a member voted for different motions I used a proposition that the member supported first. For instance, if a member voted 'yes' for a defeated motion to cut the rate by 0.50% and then also voted 'yes' for a motion to cut the rate by 0.25%, I record the member's preferred change to the rate at this meeting as 0.50% cut, treating his support for 0.25% cut as a compromise decision.

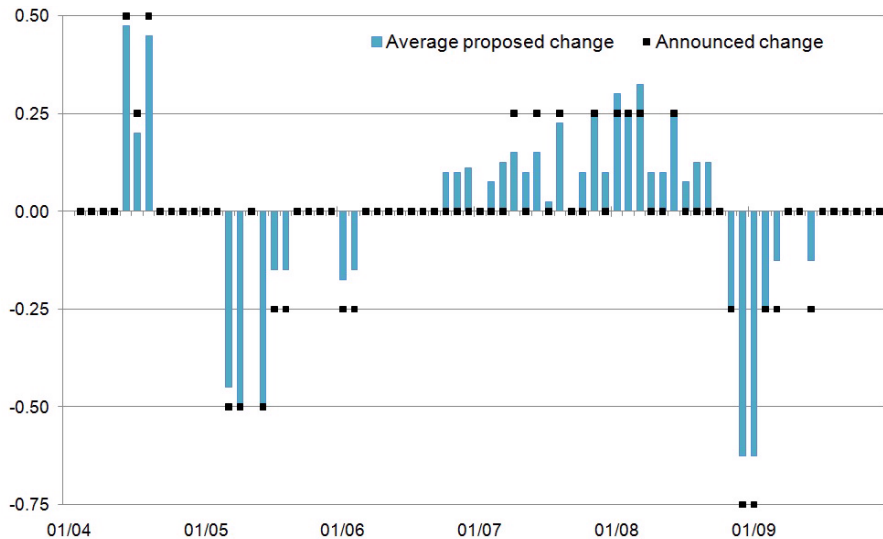
Disagreement among MPC members

- What was the level of disagreement among MPC members in the interest rate setting?
- I measure the degree of disagreement among MPC members by variable $dissent_t$ calculated, following Gerlach-Kristen (2004), as difference between officially announced change to the reference rate and the average of the changes proposed by the individual MPC members at meeting t .

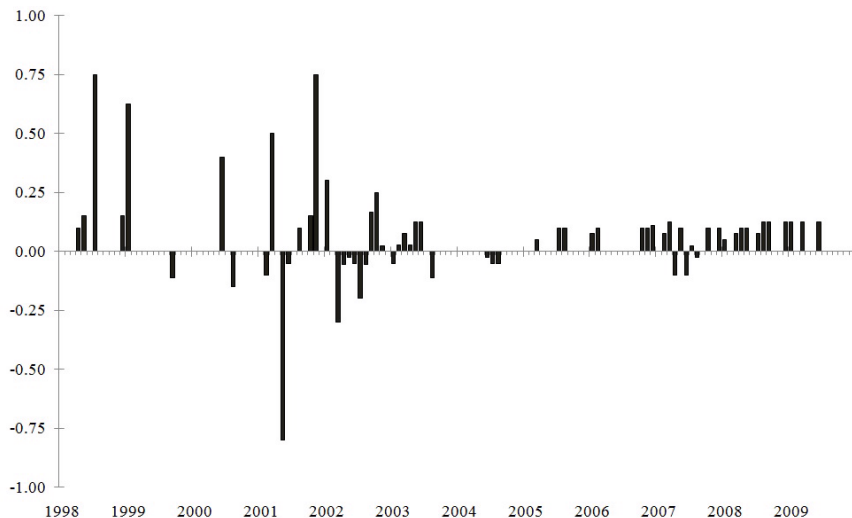
Disagreement among MPC members, 1998/02 - 2004/01



Disagreement among MPC members, 2004/02 - 2009/12



Difference between average proposed and announced changes

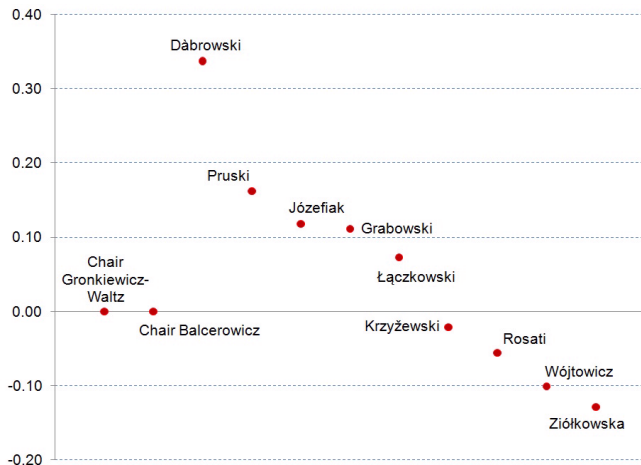


Disagreement among MPC members

Absolute difference between average proposed and announced changes

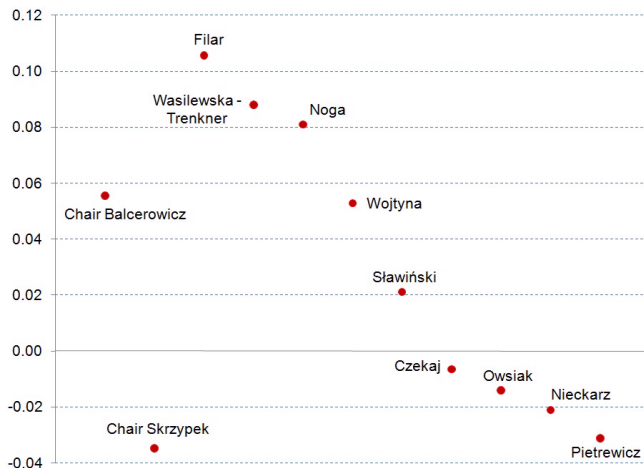
Policy decision	Average (maximum) absolute disagreement, basis points	
	1998/02 - 2004/01	2004/02 - 2009/12
cut	17.7 (75.0)	7.1 (12.5)
no change	4.5 (80.0)	2.9 (12.5)
hike	5.2 (15.0)	4.3 (10.0)
All	9.5 (80.0)	3.9 (12.5)

Deviation of individual rate proposals from MPC decision (1998 - 2004)



Deviation of individual rate proposals from MPC decision

(2004 - 2009)



Predicting policy rate with MPC voting records

- Now I will present the econometric evidence on whether the individual voting records can improve the prediction of next policy rate move compared to when only the aggregate decision is known. This finding is robust to variation in the specification of estimated monetary policy reaction functions.
- It is worth to start by mentioning that correlation between lagged measure of disagreement $dissent_{t-1}$ and current change to the rate ΔR_t is itself very low: Pearson correlation coefficients are 0.13 and -0.03 for the first and second sub-periods, respectively.
- Indeed, the lagged dissenters' views $dissent_{t-1}$ demonstrate no predictive power for ΔR_t as a single explanatory variable in the ordered probit model for both sub-periods.

Do dissenting votes help predicting policy decisions?

Sample: 1999/02 - 2004/01

Model	Log likelihood	McFadden	McKelvey-Zavoina	Correctly predicted
Naïve "no change" prediction				0.56
Naïve "the same change as before" prediction				0.51
Pure interest rate smoothing model	-50.13 (-58.80)	0.22 (0.08)	0.21 (0.48)	0.62 (0.55)
Taylor rule with interest rate smoothing	-44.89 (-54.47)	0.30 (0.15)	0.62 (0.36)	0.65 (0.53)
Forward-looking Taylor rule with interest rate smoothing	-47.46 (-57.54)	0.26 (0.10)	0.57 (0.26)	0.58 (0.48)
Empirical model	-19.90 (-30.56)	0.69 (0.52)	0.97 (0.91)	0.87 (0.70)

Do dissenting votes help predicting policy decisions?

Sample: 2004/02 - 2009/12

Model	Measures of fit with (without) Dissent _{t-1}			
	Log likelihood	McFadden	McKelvey-Zavoina	Correctly predicted
Naïve "no change" prediction				0.66
Naïve "the same change as before" prediction				0.62
Pure interest rate smoothing model	-54.44 (-58.19)	0.23 (0.18)	0.46 (0.37)	0.70 (0.69)
Taylor rule with interest rate smoothing	-45.62 (-49.32)	0.35 (0.30)	0.64 (0.57)	0.70 (0.66)
Forward-looking Taylor rule with interest rate smoothing	-40.72 (-45.38)	0.42 (0.36)	0.72 (0.63)	0.69 (0.76)
Empirical model	-10.53 (-15.17)	0.79 (0.85)	0.99 (0.98)	0.93 (0.87)

Specification of empirical model for 1999/02 - 2004/01

- $I_Exp_Inf - T$ - an indicator variable that is equal to 1 if deviation of CPI forecast by Reuters survey of banking analysts over next 11 months from the inflation target is positive, and 0 otherwise;
- $\Delta Core_CPI_{xac}$ - monthly change in the core CPI less administratively controlled prices;
- $\Delta Cons_Expenditure$ - change since the last MPC meeting in the index of final consumption expenditure of households;
- $WIBOR6M_t - R_{t-1}$ - spread between 6-month Warsaw interbank offer rate and reference rate set at previous MPC meeting;
- $\Delta WIBOR1Y$ - change over 365 days in the 30-day average of one-year Warsaw interbank offer rate.

Empirical model for 2004/02 - 2009/12 period

Parameter	Coeff.	Error	Prob.	Coeff.	Error	Prob.
I_Exp_Inf - T	1.49	0.81	0.07	3.20	1.03	0.00
Δ Core CPI _{ac,t}	2.04	0.79	0.01	4.75	1.34	0.00
Δ Cons. Expenditure _t	0.76	0.28	0.01	1.66	0.36	0.00
WIBOR6M _t - R _{t-1}	1.52	0.49	0.00	2.16	0.56	0.00
Δ WIBOR1Y _t	0.41	0.12	0.00	0.76	0.18	0.00
Dissent _{t-1}				6.02	1.27	0.00
γ_1	-3.22	0.78	0.00	-5.65	1.14	0.00
γ_2	-2.46	0.69	0.00	-4.32	1.01	0.00
γ_3	5.21	1.09	0.00	9.06	2.07	0.00
Goodness-of-fit measures						
Log Likelihood	-30.56			-19.90		
AIC	77.12			57.79		
Adjusted Estrella	0.66			0.82		
McFadden's LRI	0.52			0.69		
McKelvey-Zavoina	0.91			0.97		
Correctly predicted	0.70			0.87		

Specification of empirical model for 2004/02 - 2009/12

- $\Delta Core_CPI_{tri}$ - monthly change in the core CPI, 15% trimmed mean;
- $\Delta Exp_Inflation$ - monthly change in the deviation of expected rate of CPI gathered by Ipsos survey from the inflation target;
- $\Delta Output$ - change since last MPC meeting in the index of domestic demand;
- ΔExp_Output - change since the previous release in the annual rate of GDP central projection by NBP over next eight quarters;
- $\Delta WIBOR1M$ - change since the last MPC meeting in the 1-month Warsaw interbank offer rate;
- $WIBOR1Y_t - R_{t-1}$ - spread between 1-year Warsaw interbank offer rate and reference rate set at previous MPC meeting;
- $Econ_situation$ - measure of general economic situation from Business Tendency Survey (BTS) in industry gathered by GUS;
- $\Delta Exp_Econ_situation$ - monthly change in the measure of expected general economic situation from the BTS in industry.

Empirical model for 2004/02 - 2009/12 period

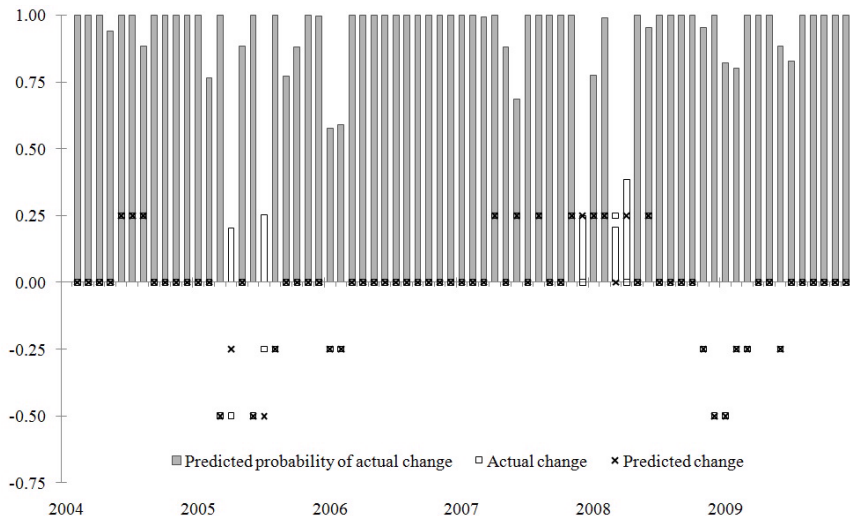
Parameter	Coeff.	Error	Prob.	Coeff.	Error	Prob.
Δ Core CPI _t	2.88	1.48	0.05	6.44	3.16	0.04
Δ Expected Inflation _t	2.07	0.98	0.03	5.41	1.80	0.00
Δ Output _t	1.44	0.41	0.00	2.62	0.76	0.00
Δ Expected Output _t	1.94	0.57	0.00	4.23	1.50	0.00
Δ WIBOR1M	9.40	2.99	0.00	23.86	6.90	0.00
WIBOR1Y _t - R _{t-1}	5.11	1.41	0.00	9.16	2.73	0.00
Economic situation _t	0.21	0.07	0.00	0.39	0.12	0.00
Δ Exp. Econ. situation _t	0.26	0.08	0.00	0.58	0.18	0.00
Dissent _{t-1}				24.77	7.67	0.00
γ_1	-6.28	1.55	0.00	-12.92	4.07	0.00
γ_2	-1.65	0.81	0.04	-3.03	1.08	0.00
γ_3	11.75	2.97	0.00	23.65	6.98	0.00

Goodness-of-fit measures

Log Likelihood	-15.17	-10.53
AIC	52.34	45.06
Adjusted Estrella	0.86	0.90
McFadden's LRI	0.79	0.85
McKelvey-Zavoina	0.98	0.99
Correctly predicted	0.87	0.93

Predicted probabilities of actual MPC decisions

Empirical Model for 2004/02 - 2009/12



Comparison with market anticipation

- Market anticipation is given by the policy rate forecast from the Reuters survey of bank analysts made one day prior each policy-making MPC meeting.

Sample	1999/02-2004/01		2004/02-2009/12	
Model	Correctly predicted decisions out of 60	Average likelihood of observed decisions	Correctly predicted decisions out of 71	Average likelihood of observed decisions
Reuters survey of bank analysts	50 (83%)	0.77	62 (87%)	0.82
Empirical model	42 (70%)	0.70	62 (87%)	0.86
Empirical model with <i>Dissent</i>	52 (87%)	0.80	66 (93%)	0.90

Conclusions

- The policy decisions of the NBP are predictable by observing the arriving economic and financial news in the real-time setting and using an appropriate econometric technique. Estimated policy rules explains correctly about 79% of observed policy decisions during the 1999-2009 period and outperform the predictions by Taylor rules, both original and extended.
- However, the study shows that if the MPC voting records were available before the next MPC meeting they would improve the predictability of policy rate decisions. More specifically, the disagreement on policy actions among MPC members is helpful in predicting the next policy change. Including voting data improves the proportion of correctly predicted decisions by 11%.
- Thus, this paper provides empirical evidence in favor of timely release of MPC voting records, not published in Poland before the next policymaking meeting, but released much later.

Conclusions

- The paper employs a modeling framework (well suited for many central banks) that avoids some common distortions of policy-action-generating process by combining the use of discrete regression method - ordered probit model, real-time data and decision-making meetings as a unit of observation.
- The strong predictive power of voting data in employed modeling framework is robust to variety of specifications, including backward- and forward-looking Taylor-like rules augmented by lagged interest rate changes and money market interest rates.
- The estimated policy rules outperform the market anticipation of policy actions, made one day before each MPC meeting during the 1999 - 2009 period, and correctly predict about 90% of policy decisions.
- The above findings are based on the information about desired policy action of all MPC members, but do not require knowledge of MPC members' names attached to each individual policy preference.