JEL Classification: D78, E52, E58
Keywords: monetary policy, voting record, transparency

Is the U.S. Fed Voting Record Informative about Future Monetary Policy?*

Roman HORVÁTH—Institute of Economic Studies, Faculty of Social Sciences, Charles University, Prague (roman.horvath@gmail.com), *corresponding author*

Kateřina ŠMÍDKOVÁ—Czech National Bank, and Institute of Economic Studies, Charles University, Prague (katerina.smidkova@cnb.cz)

Jan ZÁPAL—London School of Economics; CERGE-EI, Prague; and IAE-CSIC, Barcelona (j.zapal@lse.ac.uk)

Abstract

We examine the information content of U.S. Fed voting records under the Greenspan chairmanship. We find that the voting records of FOMC members, as captured by the difference between the average voted-for and actually implemented policy rate, signal the future course of monetary policy. The committee bias, an official statement on how the Fed is leaning in terms of its next interest rate move, is found to improve monetary policy predictability, too. On the other hand, the voting of alternate members, who actively contribute to the discussions at the monetary policy meetings but whose votes do not count for setting the interest rate, does not have predictive power and is more in line with that of the chairman.

1. Introduction

Many central banks around the world have become much more transparent during the last two decades and there is an intense discussion on the benefits and costs of greater transparency (Blinder et al., 2008; Geraats, 2009). In this short paper, we examine to what extent the increased transparency has the effect of making monetary policy predictable. We focus on one particular aspect of transparency: the attributed voting records from monetary policy meetings. Transparency-cautious central banks release them typically together with the minutes of monetary policy meetings. Ideally, these voting records should help external observers understand monetary policy better (Gerlach-Kristen, 2004). In other words, they should be informative about future monetary policy.

We examine the unique monetary policy institutional setting of the U.S. Fed. The monetary policy interest rate is set by the Federal Open Market Committee (FOMC), which comprises twelve members, with seven members from the Federal Reserve Board and five of the twelve Federal Reserve Bank presidents. Except for the Federal Reserve Bank of New York president, all the presidents serve one-year terms on a rotating basis. We label this group as the alternate members.

* The authors thank two anonymous referees, Marianna Blix-Grimaldi, Jakob de Haan, Michael Ehrmann, Petra Gerlach-Kristen, Etienne Farvaque, Jan Filáček, Tomáš Holub, Jarek Hurník, Jakub Matějů, Marek Rozkrut, Marek Rusnák, Pierre Siklos, Andrey Sirchenko, and seminar participants at the CESifo conference on central bank communication, the European Public Choice Society annual conference, the Czech Economic Society biennial conference, the Czech National Bank, and the Eurasia Business and Economics Society conference for helpful comments. The views expressed in this paper are not necessarily those of the Czech National Bank. We appreciate the support from the Grant Agency of the Czech Republic, No. P402/10/0448.

There is a large literature examining the voting records of the U.S. Fed FOMC (see Chappell et al., 2005, and Meade and Stasavage, 2008, among others). This literature focuses on the incentives to dissent and estimates the individual reaction functions of FOMC members. Nevertheless, unlike in the case of several inflation-targeting central banks in Europe (Gerlach-Kristen, 2004; Horvath et al., 2012), empirical analysis of the signaling role of the FOMC voting records is still missing. Therefore, we use the data for the Greenspan chairmanship and analyze whether they convey information about future monetary policy.

The institutional setting of monetary policy conduct in the U.S. provides an interesting case of how to extend previous evidence on European central banks (see Chappell et al., 2005, for details on U.S. Fed decision-making). The U.S. Fed releases not only the voting record of the regular members, but also the voting record of the alternate members, who are present at monetary policy meetings and actively participate in the discussions. These alternate members are asked to state their preferred interest rate, but their voting does not count, i.e., they do not have voting power. Clearly, unlike for other central banks, this allows us to investigate whether the voting record of the alternate members has predictive power too, or whether these members use their voting to signal something else, such as to influence policy deliberations (Tillman, 2011).

In addition, the U.S. Fed releases the so-called committee bias—an official statement of the Fed on how it is leaning in terms of its next interest rate move (at least during our sample period; see the data description below). This statement carries very similar information to the voting records and we can therefore subject the voting records to a demanding sensitivity check of its significance. All in all, the U.S. data allow us to study the informativeness of the voting record for future policy in a richer setting than previous studies examining several European inflation-targeting central banks (Gerlach-Kristen, 2004; Horvath et al., 2012).

Our results show that both the voting record and the committee bias are indeed informative about future monetary policy. On the other hand, the voting behavior of the alternate members is close to that of the chairman and lacks predictive power.

In the remainder of the paper, the empirical model is presented in Section 2. Section 3 describes the data. Section 4 presents the results. Concluding remarks are provided in Section 5.

2. Empirical Model

Following Gerlach-Kristen (2004) and Horvath et al. (2012), we calculate an indicator called *skew*, defined as the difference between the average policy rate voted for by the individual committee members and the policy rate that is the outcome of the majority vote.

We define a measure of disagreement in the bank board, the variable *skew*, as

$$skew_t = average\ (i_{j,t}) - i_t \tag{1}$$

where $i_{j,t}$ is the interest rate voted for by member j at a monetary policy meeting at time t, and i_t denotes the monetary policy rate. Clearly, positive values of *skew* indicate that some members vote for higher rates than the majority.[1]

First, we estimate whether *skew* carries information once we control for lagged policy as in Gerlach-Kristen (2004) and Horvath et al. (2012). Therefore, we estimate

$$\Delta i_{t+1} = a_0 + a_1 * skew_t + a_2 * \Delta i_t + u_{t+1} \quad (2)$$

Next, we extend the empirical model of Gerlach-Kristen (2004) and Horvath et al. (2012) and estimate:

$$\Delta i_{t+1} = b_0 + b_1 * skew_t + b_2 * \Delta i_t + b_3 * dispersion_t + b_4 * committee\ bias_t + \\ + b_5 * skew\ alternates_t + u_{t+1} \quad (3)$$

We expect b_1 to be positive if the voting records convey some information, or to be insignificant. b_2 is expected to be positive, too, since it is likely that policy makers avoid sudden policy reversals.

Nevertheless, the nature of policy-making in the U.S. allows us to include more relevant regressors than previous studies. We additionally include the skew for the alternate members, *skew alternates*$_t$, as well as the committee bias. The data are first partitioned into voters and non-voters, and the data on voters are used for the calculation of *skew*$_t$, while the data on non-voters are used to obtain *skew alternates*$_t$. We expect this coefficient to be positive (the hypothesis is that the alternate members' voting behavior is conceptually the same as the voting of the regular members) or insignificant. The committee bias is coded in three values (–1,0,1) so that a higher value indicates an upward move of interest rates.[2]

Finally, we also include a measure of the dispersion of the votes to grasp the uncertainty further. We measure the dispersion of the voting results by the standard deviation of the individual votes. We expect b_4 to be negative or insignificant. A negative coefficient would suggest that greater uncertainty about the optimal interest rate delivers looser monetary policy (Soderstrom, 2002; Bekaert et al., 2010).

Finally, we also consider that future interest rates may be affected by macroeconomic conditions. For this reason, we extend equation (3) to additionally control for the change in future inflation (*i* stands for 12-months-ahead inflation to reflect the forward-looking nature of monetary policy conduct in inflation-targeting central banks):

$$\Delta i_{t+1} = b_0 + b_1 * skew_t + b_2 * \Delta i_t + b_3 * dispersion_t + b_4 * committee\ bias_t + \\ + b_5 * skew\ alternates_t + b_5 * inflation_{t+1+i} + u_{t+1} \quad (4)$$

More information on the data we use is available in the following section. Equations (2)–(4) are estimated by an ordered probit technique to reflect the discrete nature of monetary policy rate changes. The discrete dependent variable has been stacked in fewer categories, as some policy change magnitudes happened rarely. The number of categories is set according to the log-likelihood of competing models. Note that the fact that we stack the dependent variable in fewer categories reduces the possible impact of vertical outliers.

[1] Note that there is a related literature which examines the effect of dispersion in the voting record on the predictability of monetary policy. See Ehrmann and Fratzscher (2013) and Riboni and Ruge-Murcia (2012) for recent contributions. Future research may also focus on examining whether interquartile distributions are a vital way to assess disagreement.

[2] Financial market expectations data are not included in the empirical model for the U.S. due to significant lags in publishing the minutes, which were available only after the subsequent meeting in our sample.

3. Data

The data are from Chappell et al. (2005), who code the policy preferences of individual FOMC members based on the transcripts of the FOMC monetary policy meetings in 1987:8–1996:12. The FOMC meets eight times per year (approximately once every six weeks) and the number of observations is therefore 74. The decision about the appropriate policy rate is taken by a majority vote.

The desired federal funds rate for individual FOMC members is available directly from the records in 92.4% of cases under the Greenspan chairmanship. By available directly, Chappell et al. (2005) mean that the individual member explicitly stated the desired range for the policy rate or explicitly expressed a preference for the staff policy scenario or another committee member with an explicit target range for the federal funds rate. Each individual's desired funds rate is calculated as the mid-point of the reported range. In the remaining 7.6% of cases, where the preferred policy rates are not observed, the textual record of committee deliberations (lean for ease, lean for tightness or assent with staff proposal) is used to code the member's policy positions. The coding is complemented with the estimation of individual reaction functions, where the reaction functions are used to calculate expected values for the desired funds rates, conditional on the information provided by leaning positions. These 7.6% of cases typically happen at the beginning of our sample. The results remain unchanged if we exclude these observations. The corresponding regression results are available upon request.

We are able to calculate the skew both for voting members and for alternate members, who are present at the policy meeting but do not have voting power (in fact, these so-called non-voting FOMC members express their preferences through voting, but their votes do not count). Neither of these two skew measures was available to the public in a timely fashion. The committee bias was announced from 1983 to 1999 in official Fed statements on how the Fed was leaning in terms of its next interest rate move, and the variable is coded so that a higher value indicates an upward move of interest rates.

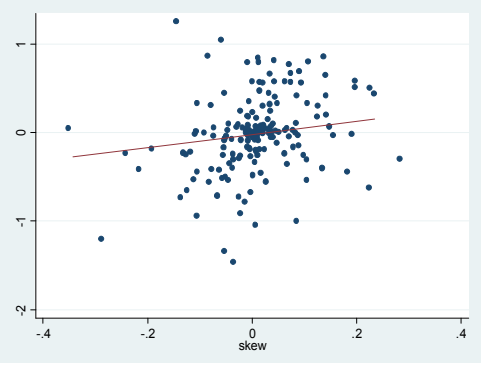
As we said, we use the data from 1987:8 to 1996:12. We do not use earlier data, as Thornton (2006) emphasizes that the Federal Reserve increasingly shifted attention to targeting the federal funds rate in the way we understand it now—in terms of a Taylor-type rule—only during the Greenspan chairmanship. We restrict our data to 1996:12 for the following reasons. First, the data are coded by Chappell et al. (2005), and by using one source of data we ensure consistency in the coding. Second, one of our explanatory variables, the committee bias, is available up to 1999 and the institutional framework did not change between 1997 and 1999.

4. Results

Figure 1 presents the link between the actual voting record skew of the FOMC members and the future policy rate change. The link seems to be positive, although there are cases where skew can give a noisy signal about future policy, for example when the rates are not changed and one board member dissents. However, when we examine various signal-to-noise ratios, we can see that they are typically well above 50%.

Our regression results are available in *Tables 1* and *2*. We find that *skew* is statistically significant in all cases at the 1% level. It remains significant even with

Figure 1 Voting Record Skew and Policy Rate Change at the Next Meeting



Notes: Skew is plotted on the *x*-axis, while the future policy rate change is plotted on the *y*-axis. Jitter is used for overlapping observations for expositional purposes.

the measure of committee bias, which in principle carries very similar information and reduces the number of dissenting votes below the number that would have occurred without the asymmetric policy directive (Thornton and Wheelock, 2000). The dissenting behavior of FOMC members is thus able to predict the future course of monetary policy.[3] In fact, *skew* remains significant even if we exclude the first years of the Greenspan chairmanship, i.e., the period for which it could be argued that Greenspan had not yet established his reputation. These results are available upon request.

In addition, the results for the committee bias are in line with Thornton and Wheelock (2000), who show that when the FOMC issued an asymmetric directive, policy changes at the next meeting were typically in the direction of the committee bias. Interestingly, once committee bias is included, the lagged rate change is no longer statistically significant.

The finding that *skew alternates* is not significant in any specifications is broadly consistent with Tillman (2011), who shows that the FOMC alternate members systematically exaggerate their views to influence policy deliberation. It is noteworthy that the voting of the alternate members is much more in line with the chairman than the voting of the FOMC members with voting power. The sample average difference in absolute terms between Greenspan's preferred policy rate and the alternates' preferred rate is only 0.07, while this difference is 0.20 for the FOMC members with voting power. The difference between the means (0.07 and 0.20) is statistically significant at the 1% level. The high correlation of Greenspan's preferred policy rate and the alternates' preferred rate may explain the insignificance of *skew alternates*. Interestingly, Rülke and Tillmann (2011) find that alternate members, after the monetary policy meeting, report inflation forecasts typically further from the mean, as compared to voting members. While this may look at odds with our results at first sight, it is difficult to compare our results with Rülke and Tillmann (2011). Rülke and Tillmann (2011) examine the behavior of the alternate members vis-à-vis the consensus view, while we investigate it vis-à-vis the chairman. Nevertheless,

[3] See also Gerlach-Kristen and Meade (2010), who show that the balance of dissents in the FOMC helps predict the future change in the policy rate.

Table 1 Does the Voting Record Predict Policy Rate Changes in the U.S.?

$\Delta i_{t+1} = b_0 + b_1 * skew_t + b_2 * \Delta i_t + b_3 * dispersion_t + b_4 * committee\ bias_t + u_{t+1}$

	(1)	(2)	(3)	(4)
Lagged rate changes (b_2)	0.41***	0.38***	0.11	0.06
	(0.13)	(0.12)	(0.15)	(0.15)
Skew (b_1)	12.25***	12.54***	9.19***	8.79***
	(2.64)	(2.65)	(2.83)	(2.90)
Dispersion (b_3)		1.14		2.70
		(2.01)		(2.14)
Committee bias (b_4)			1.08***	1.19***
			(0.28)	(0.28)
Adj. pseudo *R*-squared	0.18	0.18	0.27	0.28
Observations	74	74	74	74

Notes: * Statistically significant at 10% level, ** statistically significant at 5% level, *** statistically significant at 1% level. Robust standard errors in parentheses. Ordered probit estimation.

Table 2 Does the Voting Record Predict Policy Rate Changes in the U.S.? Skew for Alternate Members Added

$\Delta i_{t+1} = b_0 + b_1 * skew_t + b_2 * \Delta i_t + b_3 * dispersion_t + b_4 * committee\ bias_t +$
$+ b_5 * skew\ alternates_t + b_5 * inflation_{t+1+i} + u_{t+1}$

	(1)	(2)	(3)	(4)	(5)
Lagged rate changes (b_2)	0.38***	0.37***	0.07	0.05	0.11
	(0.12)	(0.12)	(0.15)	(0.15)	(0.15)
Skew (b_1)	11.39***	10.88***	11.21***	10.39***	9.54***
	(3.36)	(3.44)	(3.50)	(3.59)	(2.84)
Skew—alternates (b_5)	1.16	1.37	-1.82	-1.53	
	(1.79)	(1.82)	(1.99)	(2.02)	
Dispersion (b_3)		1.39		2.48	
		(2.04)		(2.16)	
Committee bias (b_4)			1.22***	1.26***	1.09***
			(0.29)	(0.30)	(0.28)
Inflation change (b_6)					-0.50
					(0.40)
Adj. pseudo *R*-squared	0.19	0.19	0.28	0.29	0.28
Observations	74	74	74	74	74

Notes: * Statistically significant at 10% level, ** statistically significant at 5% level, *** statistically significant at 1% level. Robust standard errors in parentheses. Ordered probit estimation.

both our results and the results by Rülke and Tillmann (2011) suggest that there is a systematic difference in the behavior of voters and non-voters. Finally, the dispersion in the voting record is never found to be significant.

5. Concluding Remarks

In this short paper, we focus on the effects of U.S. monetary policy transparency. More specifically, we examine whether the voting records of the FOMC members, including the voting records of the alternate members and U.S. Fed official statements, indicate future policy.

We find that the voting records of U.S. Fed committee members under the Greenspan chairmanship are useful for understanding the future course of monetary policy. On the other hand, the voting records of the alternate members do not signal future policy and typically are more in line with the chairman. Alternate members attend the meeting and actively contribute to the monetary policy discussions, but do not have voting power (although they do express their preferred interest rate, which allows us to construct an artificial voting record series for them). The committee bias of the FOMC is found to be informative about future policy, too.

All in all, the results suggest that FOMC members tend to put the same effort into forming their views no matter whether their voting is published soon after the meeting or after a longer period of time. Hence, the general policy implication of releasing voting records faster is that it would be beneficial both for the public and for central banks, which could gain credibility.

REFERENCES

Bekaert G, Hoerova M, Lo Duca M (2010): Risk, Uncertainty and Monetary Policy, *NBER Working Paper*, no. 16397.

Blinder AS, Ehrmann M, Fratzscher M, Haan J de, Jansen D-J (2008): Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence. *Journal of Economic Literature*, 46(4):910–945.

Chappell HW, McGregor RR, Vermilyea T (2005): *Committee Decisions on Monetary Policy, Evidence from Historical Records of the Federal Open Market Committee.* MIT Press, Cambridge.

Ehrmann M, Fratzscher M (2013): Dispersed Communication by Central Bank Committees and the Predictability of Monetary Policy Decisions. *Public Choice*, forthcoming.

Geraats PM (2009): Trends in Monetary Policy Transparency. *International Financ*e, 12:235–268.

Gerlach-Kristen P (2004): Is the MPC's Voting Record Informative about Future UK Monetary Policy? *Scandinavian Journal of Economics*, 106:299–313.

Gerlach-Kristen P, Meade E (2010): Is There a Limit on FOMC Dissents? Evidence from the Greenspan Era. *American University economics working papers*, no. 2010-16.

Horvath R, Smidkova K, Zapal J (2012): Central Banks' Voting Records and Future Policy. *International Journal of Central Banking*, 8:1–19 .

Meade EE, Stasavage D (2008): Publicity of Debate and the Incentive to Dissent: Evidence from the US Federal Reserve. *Economic Journal*, 118(528):695–717.

Riboni A, Ruge-Murcia F (2011): Dissent in Monetary Policy Decisions.The *Rimini Centre for Economic Analysis, Working Paper Series*, no. 27-11,

Rülke J-C, Tillmann P (2011): Do FOMC members herd? *Economics Letters*, 113:176–179.

Soderstrom U (2002): Monetary Policy with Uncertain Parameters. *Scandinavian Journal of Economics*, 104(1):125–45.

Thornton DL (2006): When Did the FOMC Begin Targeting the Federal Funds Rate? What the Verbatim Transcripts Tell Us. *Journal of Money, Credit and Banking*, 38:2039–71.

Thornton DL, Wheelock DC (2000): A History of the Asymmetric Policy Directive. *Federal Reserve Bank of St. Louis Review*, 82:1–16.

Tillman P (2011): Strategic Forecasting on the FOMC. *European Journal of Political Economy*, 27:547–553.