

# Collective Decision-Making in Monetary Policy – A Survey

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## Summary:

The article aims at surveying the economic literature related to collective decision making in monetary policy. In order to do so it proposes a coherent framework allowing for a structured analysis of the factors influencing the works of a monetary policy committee. These factors are divided into external (shaped outside of the committee e.g. by law) and internal ones (related to the composition of the committee and interactions between its members). The survey proves that the problems analysed in literature indeed fit the proposed framework. Moreover, it points out some of the problems which are underexplored in the existing literature and thus provides interesting suggestions for further research, both theoretical and empirical, related to the functioning of monetary policy committees.

**Keywords:** collective decision making, monetary policy committee, committee size, decision rule, communication and learning

**JEL classification:** JEL: E58, D71, D83

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“[O]ne of the hallmarks of the quiet revolution in central banking practice has apparently been a movement toward making decisions by committee, whereas previously the dictatorial central bank governor was more the norm.”  
(Blinder, 2004, p. 35)

## 4.1. INTRODUCTORY REMARKS

Theoretical arguments indicating superiority of collective decision making over individual decisions are old and go back at least to Condorcet (1785). In practice, however, the strength of this argument depends upon the fulfilment of many conditions (see e.g. Gerling *et al.*, 2005) and the context of the decision-making. Among the key examples of committees making decisions in some important domains, one can mention parliaments, governments juries, supervisory and managing boards of enterprises or even editorial boards of scientific journals. Nevertheless, the most powerful, or at least enjoying the highest reputation, among them are probably the monetary policy committees (MPCs)<sup>1</sup>.

The presence of MPCs in public consciousness is a proof of both its importance and the need for a more precise understanding of their functioning. Thus, the aim of the present chapter is to survey the relevant economic literature analysing the internal characteristics and external influences over the collective monetary policy making.

A general view and analysis of collective decision making presented by Stanek (2013) is obviously valid also for decision-making process in monetary policy. Nevertheless, such a specific context necessitates also a deeper analysis and allows for more precise argumentation and modelling.

The discussion will be organized around a simple conceptual framework introduced in the next section. Thus, the following parts of the chapter will present the research concerning MPCs by grouping it around two main lines: external and internal factors shaping decision-making process within the committee. The analysis will be started, however, by presenting some more precise arguments in favour of delegating the monetary powers to a committee, which is a relatively recent trend.

## 4.2. CONCEPTUAL FRAMEWORK

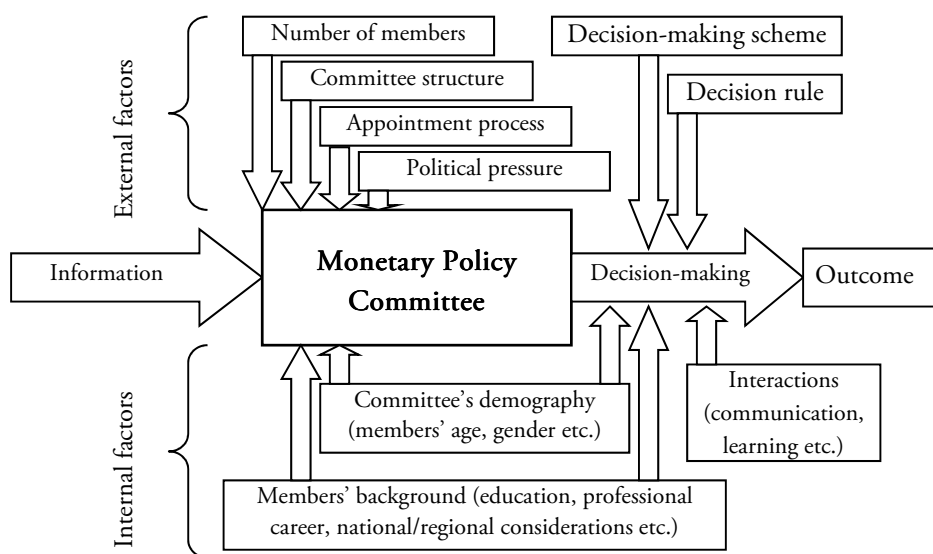
To conceptualise the analysis of decision making in an MPC and its determinants, a simple scheme is proposed: a committee obtains some information (possibly divergent or differently interpreted by different members) and reaches a decision through a decision-making process. However, two groups of factors may influence its work and outcomes.

First, external determinants influence the committee and the process of reaching the decision. They represent structural and institutional characteristics shaped by laws regulating the framework of monetary policy making and include

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<sup>1</sup> Hereafter, MPC will designate any committee whose competence is interest rate setting. Thus, this term covers the British Monetary Policy Committee, the American Federal Open Market Committee, the Board of Governors of the European Central Bank and other similar decision making bodies.

such elements as the organisational setup (number of committee members, decision-making rule, etc.), appointment process and also possibly encompass external pressure (political pressure or “central bank bashing” being the most common examples). Second, internal features, including preferences of the committee members and diverse interactions among members clearly exert effect on quality and character of the decision-making activity. It seems logical, that preferences of committee members are shaped by their personal experience and thus can be proxied by their demographic and social characteristics. This broad idea is visualised by figure 4.1.



**Figure 4.1.** Decision-making by a monetary policy committee

Source: own elaboration, see also Stanek (2013, p. 105).

The simplicity and clarity of the illustration requires an omission of some interactions among internal and external factors. For instance, personal characteristics of (potential) committee members obviously influence their eligibility and, theoretically, the optimal number of members is related to the voting rule (see below).

Elements presented on figure 4.1 will be analysed throughout the present chapter. The next section starts with some arguments for delegating monetary policy to committees rather than to individuals. In what follows, internal/external factors analysis is applied to interest rate setting, but expanded to some particular questions such as appointment process and political influence as well as internal factors exerting effects on monetary decision making.

### 4.3. INDIVIDUAL CENTRAL BANKER VS. MONETARY POLICY COMMITTEE

Modelling of monetary policy making has been dominated by a vision of a 'central banker' whose decisions optimize social welfare usually defined as minimal gaps between natural and effective levels of inflation and output. This is true for the seminal Barro and Gordon (1983a; 1983b) models, which were themselves influenced by Kydland and Prescott's (1977) argument highlighting the advantage of rules over discretion. These works lead to the idea of a conservative central banker (Rogoff, 1985) as an effective cushion against inflation bias or time-inconsistency problems of monetary policy.

All these works as well as a considerable amount of other related research, contributing substantially to an understanding of the art and science of monetary policy, has not explored the collective dimension of monetary policy making, which became in recent years the rule rather than the exception<sup>2</sup>. Major theoretical works were rarely focused on this specific feature of monetary policy.

One of the early examples, founded on reputation motivations of monetary policy committee members (thus joining the above quoted time-inconsistency literature) has been presented by Cothren (1988). In his model of  $n$ -member committee serving for  $n$  overlapping terms, ( $n$  being an odd number), less experienced (and more sensitive for future losses implied by higher inflation) members are able to outvote opportunistic ones, willing more inflation. Thus, individual considerations of finitely-lived committee members may generate credibility for the whole committee, which has been proved to be of special concern for the efficiency of monetary policy<sup>3</sup>.

Sibert (2003) analyses individual credibility seeking and its implications for the committee<sup>4</sup>. In her model, social welfare depends negatively on (squared) actual inflation and positively on unanticipated inflation (because it boosts output). The MPC is modelled here as a two-member committee with staggered terms. A committee member may be more or less inflation-prone; her type is constant during the mandate and is drawn with a probability  $p$ , which is common knowledge. The focus on reputation issues, which may be traced back to Backus and Driffill (1985) and Barro and Gordon (1983a; 1983b), logically implies that the model

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<sup>2</sup> These exceptions are constituted by New Zealand (with its "optimal central bank contract"), Norway, Malta and Israel (which recently announced its plans to reshape the central bank law and introduce an MPC, see Fischer, 2006). Blinder (2004, p. 35) remarks that probably Canada should also be considered as an economy guided by a single monetary policy maker. A few other countries where decisions are made by single person are, in fact, currency boards with no interest rate decisions to take.

<sup>3</sup> See e.g. Cukierman's (1992) reference work.

<sup>4</sup> Interestingly, the model employs a Bayesian updating in the private sector, who acquires the signal about the type monetary policy maker in order to form its inflation expectations.

is based on the standard time-consistency framework. During the meeting the committee members announce their preferred inflation rates (0 or 1, depending on type of policy maker), and if they agree, the rate is implemented while in case of disagreement some consensual rate  $\alpha$  ( $0 < \alpha < 1$ ) is decided upon. The author searches for the probability with which the junior opportunistic committee member votes for zero inflation (in order to gain reputation and be able to implement higher inflation in her second term).

Sibert (2003) analyses three cases: (i) full transparency of voting (implying that the type of the senior policy maker is publicly known), (ii) voting records published with a lag (making the junior member ignoring his older colleague's type) and (iii) hierarchical structure of central bank (where a senior member's vote is more important than the junior's one).

The presented comparison of efficiency (understood as expected social welfare) between monetary policy lead by the individual and the committee shows the superiority of the collective decision making (under some plausible assumptions about the consensual rate of inflation). This is implied by stronger reputation incentives for an opportunistic junior not to reveal his inflation preference if he takes part in the committee, than if he is the sole responsible for the policy making. Thus, on average inflation is smaller and expected social welfare is greater. Moreover, when the committee makes decisions, inflation (and welfare) is less volatile because there exists a compromise level of inflation, while in case of single decision-maker inflation can be equal to either 0 or 1.

Other findings of Sibert's model include negative welfare implication of delaying the publication of voting record. This is so because it creates lower incentives for the opportunistic junior to vote against inflation. Thus, average inflation increases and expected welfare declines. Inversely, a higher weight of the senior committee member increases the incentives for reputation building of the junior one, hence expected inflation lowers and welfare increases.

The analysis, exposed in Sibert (2003), highly stylizes individual preferences categorizing policy makers as hawks or doves (who always prefer 0 or 1 inflation)<sup>5</sup>. Doves, in their potential decision of voting for zero inflation are guided only by reputational considerations and hawks always vote for zero inflation, irrespective of prevailing economic conditions (which are not explicitly modelled). One might also argue that the quadratic loss function, although standard, is not a very realistic one<sup>6</sup>. Another potential flaw is that any interaction inside the committee is ignored

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<sup>5</sup> This quite journalistic language is appropriated from ornithology (sometimes used, however, also in international relations, foreign affairs as well as in economic research): advocates of a looser monetary policy are called doves while more conservative central bankers are given the label of hawks. This makes allusion on the preferred level of interest rates (flight altitude).

<sup>6</sup> For a review of more "behavioral" central bank loss functions see Al-Nowaihi and Stracca (2003).

(there is no explicit modelling and, moreover, junior member can only guess the type of the senior member if he knows the voting record of previous voting).

A possibility of testing empirically the hypothesis that groups make monetary decisions differently than individuals is offered by “laboratory experiments”. Blinder and Morgan (2005) performed an interesting experiment facing individual students and five-student committees with a simple macroeconomic stochastic model and asking them to decide on monetary policy, which should accommodate unknown fiscal shocks. Participants were also incited to smooth interest rates (or discouraged to test the reactions of the economy), because each rate movement incurred a (small) cost. Unsurprisingly, group decisions, thanks to interaction, information and knowledge sharing as well as (supposedly) some heuristic techniques, outperformed individuals on average. The first participation in a group experiment<sup>7</sup> was also linked to a significant learning effect. The last, less expected, result was that the group did not need more time to take their decisions to change rates<sup>8</sup>. In fact, committees took their decisions with smaller lags on average, though the difference was not significant.

A similar experiment, which yielded analogue results, was led by Lombardelli *et al.* (2006). Differences concerned the applied model (which was slightly simpler), and the focus of their research – beside individual versus committee comparison, the authors looked for a more precise assessment of learning effects. They found significant improvement of the quality of decisions taken when the experiment progressed, with the exception that groups outperformed individuals independently on the stage of the research<sup>9</sup>. Perhaps surprisingly, the authors did not find any support for a positive impact of interaction among committee members.

These two experiments test only a restrained scope of committee decision making in monetary policy. As both used exclusively five-person groups, it is impossible to measure any impact of the committee size on the decision making process. Similarly, as in both experiments the subjects were only economics students (Princeton University in the case of Blinder and Morgan, 2005; and the London School of Economics in the case of Lombardelli *et al.*, 2005) which make the samples much more homogeneous than real life MPCs<sup>10</sup>. Finally, in both cases groups prove

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<sup>7</sup> The same individuals took part in individual and group decision-making experiences.

<sup>8</sup> At least in terms of 'lags' – number of meetings between the fiscal shock and accommodation of the policy stance. However, groups required more 'clock time' to reach a decision, but this was not taken into consideration. This experimental design corresponds closely to the real world requirement to get the right decision during the scheduled meeting, no matter how long it would take.

<sup>9</sup> The experience consisted of sixteen stages (ten periods each), four individual, then eight in committees (four and four without possibility of interaction) and once again four individual.

<sup>10</sup> Whose members are usually issued from various economic environments, such as private or public sector, government institutions, and central banking circles or others. Moreover, the educational attainments of MPC members are very often relatively heterogeneous. More on these subjects in Farvaque *et al.* (2009).

to be good bumpers against the worst individuals (who, besides, are able to learn the most during the experiment). The groups perform, however, similarly to the best individuals, but not significantly better than them. However, the difference between the group's and the best individuals' performance is probably of little relevance to the real world, where MPC members are usually chosen very carefully among the individuals with the best educational and professional background.

#### 4.4. EXTERNAL FACTORS

After both theoretical and empirical confirmations that committees outperform, on average, individuals in monetary policy making, the question to be asked is how to reach these good decisions. The framework to be defined includes, as exposed in section 4.24, the number of members, the voting rule, the decision-making scheme as well as appointment process and potential political pressure.

##### Number of Members

The attribute of a committee which is the easiest to perceive is its size. Although intuitive remarks, indicating relations between the size and accuracy of decisions or the size and time needed by an MPC to reach a decision have been given (e.g. Berger, 2002; Blinder, 2004), a complete theoretical analysis of the subject has not been presented. This gap is, at least to certain extent, filled in by two studies by Berk and Bierut (2003; 2004). The former article, even if focused mainly on optimal structure of the committee, confirms the Condorcet theorem (provided that members vote individually and assess the true state of the economy with a probability higher than 0.5). Further, the authors, by introducing a small marginal cost of adding a decision-maker, prove its intuitive bounding effect on the committee size. Additionally, the authors show that (in the setup with marginal cost) the optimal size is larger if a fraction of members (the board) can interact prior to the meeting. Such prior meeting may end with taking a common position by the board, if a (qualified) majority emerges. Thus, some information may be lost through such an interaction, and adding some members should compensate this loss.

In their following work, Berk and Bierut (2004) introduce a possibility of learning (see below for details). The impact on the optimal size of the committee depends on the amount of time the committee designer is willing to assign to the committee. As learning requires time, if committee meetings are long-lasting, the number of members should be reduced and inversely, if the decision-makers' time is costly, it is better to increase the committee size (and shorten the meetings).

In their two studies, Berk and Bierut (2003; 2004) have assumed that the committee takes its decisions by simple majority rule (when equal skills are assumed) or by the optimal weighted voting rule (as proposed by Ben Yashar and Nitzan,

1997, p. 4). Nevertheless, this interesting factor is not expressly modelled in these (and many other) works.

Empirically it has been shown by Berger *et al.* (2008) that bigger and more heterogeneous countries as well as those which follow a floating exchange rate regime have bigger central bank boards (monetary policy committees). This can be explained by a need of better (or more) information to take the appropriate decisions. The authors also show that bigger (on average) boards exist in more democratic countries and in the central banks which are more independent and have more numerous staff.

### Appointments

Chang (2003), in her theoretical model of appointments to the FOMC has shown that appointing is an effective method of affecting monetary policy stance. She proves that the President must take care about Senate's preferences so that the appointee could be accepted. This spatial bargaining model stylizes twelve-member FOMC appointments and predicts balance of power between main American political bodies. It clearly shows, using (similarly to Waller, 2000), the median voter theorem, that appointing candidates to the policy board in order to replace the members stepping down allows for influencing policy stance and its future path.

The author verifies empirically the model, using original datasets for FOMC members' preferences at the time of each meeting<sup>11</sup> and on Senate's signalling as well as existing Presidential signalling<sup>12</sup> and macroeconomic data. An important contribution of the book is an estimation of "ideal points" of every FOMC member (as well as members of Senate Banking Committee and US Presidents) during 1970-1995, which proxy their policy preferences. In what follows, Chang uses these estimations to confirm her theoretical model where presidential appointees must also satisfy Senate's preferences. In the context of the present dissertation, it would be interesting to ask which features of FOMC members, shape their tighter or looser monetary policy preferences.

Such a question was raised by Chappell, McGregor, Havrilesky and Vermilyea in a series of publications<sup>13</sup>. This stream of literature is founded on the observation that, for most of the twentieth century, the American monetary policy has been

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<sup>11</sup> This is different from usually constructed datasets based on dissenting votes. Moreover, the setup is binary (tighter-easier) and does not allow for status quo. The obvious advantage is that the author obtains more estimation points but at the cost of objectivity (the argument that voters always have some bias on the policy does not seem fully convincing).

<sup>12</sup> These have been constructed by Havrilesky (1995).

<sup>13</sup> Havrilesky and Schweitzer (1990), Havrilesky and Gildea (1991), Havrilesky (1991 and 1995), Chappell, Havrilesky, McGregor (1995), Chappell, McGregor (2000), Chappell, McGregor, Vermilyea (2004 and 2005)

gradually politicized (Havrilesky, 1991). The proof is a significant decreasing trend in the participation of members with private sector experience (and an increase of politically associated ones) on the FOMC<sup>14</sup>. It seems that the signal to initiate the debate was given by Belden (1989). In that early article, dissent votes have been used as a proxy for policy preferences. The obvious advantage of this approach (compared to e.g. Chang, 2003), is the full observability of the explained variable achieved, nevertheless, at the expense of the number of observations.

### Political Influence

The appointments analysed above are believed to be substantially influenced by political preferences. Waller (1992; 2000) exposes (bi)partisan bargaining models. In the latter model, the board, which members are chosen for overlapping staggered terms by two partisan branches of government (appointing – the President and confirming – the Senate) assures monetary stability equal to that of a policy rule, while allowing for political accountability. Thus, Waller (2000) shows that if the institutional (external) setup is correct, political bargaining over monetary policy institution is innocuous by itself. Nevertheless, the author ignores (which is natural in such a theoretical setup) how political affiliations will in reality influence the work of an MPC. This gap is filled by the exposed above empirical literature on the FOMC.

An interesting discussion, which comes within the scope of this topic, took place on the pages of the *Journal of Monetary Economics*. Grier (1991; 1996) argued that more liberal preferences of Senate's committees (principal) supervising the Fed (agent) were translated into looser monetary policy, measured by higher money base growth. This finding has been challenged by Chopin *et al.* (1996a; 1996b), who found that the Fed may actually counterbalance Congress preferences by contracting monetary growth when Democrats (with more expansionist preferences) possess majority. This exchange of views, although empirical and concerning only one country, is very interesting from a theoretical point of view, as it reflects the debate on central bank independence<sup>15</sup> and central bank as an agent of society<sup>16</sup>. In fact, Grier's results support the principal-agent theory, where the preferences of the principal (proxied by the preferences of the Senate Banking Committee) are translated into the Fed's monetary policy, while Chopin *et al.* show that the Fed is

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<sup>14</sup> The trend to politicization of the FOMC might have been a factor towards a loosening of monetary condition (*ceteris paribus*), as private sector (as well as Federal Reserve Bank) career is believed to make a person a more conservative central banker (Havrilesky & Schweitzer, 1990).

<sup>15</sup> See e.g. Cukierman (1992), Cukierman *et al.* (1992), Alesina and Summers (1993) for first empirical explorations of the concept or Berger *et al.* (2001) as a more critical review of evidence.

<sup>16</sup> See Persson and Tabellini (1993) as well as Walsh (1995a; 1995b).

indeed independent. As both researches are purely empirical, the diverging results are probably caused by different measures of congressional preferences. Another, broader explanation, is that the policy of the Fed is determined by personal preferences of the FOMC members. These preferences, however, may be shaped by different factors, other than the wishes of the principal (see section 4.5 below).

### Decision Rule

The starting point for the majority of studies in the field is admitting that the simple majority rule is the most frequently used in legal acts regulating the activity of central banks. Hence (as discussed in Gerling *et al.*, 2005 or Stanek, 2013), the median voter theorem is the most frequently applied to the modelling of monetary policy decisions and for analysing the implications of appointments, different preferences of members etc. Nevertheless, studies modelling explicitly the implications of different decision rules for the outcome of MPCs are relatively scarce.

An interesting attempt in such an analysis by introducing the “state of economy” as the foundation of “an optimal level of interest rates” has been presented by Gerlach-Kristen (2005). Her model focuses on the impact of the application of several majority rules in a committee, which members observe the state of the economy with a given precision, which is common to all committee members<sup>17</sup>. Their opinions are also influenced by (imperfect) understanding of other members' signals. After having assessed the state of the economy, committee members set the desired interest rate (by voting) as close as possible to the imperfectly observed optimal one. This instrumental variable may be only adjusted gradually, and steps reflect central bank tendency to change interest rates by threshold of 0.25 basis points (or its multiples).

The author shows that too strict majority requirements, approaching unanimity, may cause a high (suboptimal) degree of interest rate inertia. Likewise, a higher uncertainty in optimal interest rate observation (lower decision makers' ability) implies that policy reactions lag behind changes occurring in the economy. This signal-extracting Bayesian analysis framework seems an excellent starting point for the exploration of inside-committee affairs. However, some further insights, such as allowing for differences among committee members (be it in their way of acquiring signal, which is probably costly or a way of perceiving “optimal” interest rate, which can be biased for some members<sup>18</sup>) or communication appear necessary to make it closer to the reality of monetary policy making.

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<sup>17</sup> Thus, committee members are supposed equally skilled. More technically, all members observe the true state of the nature with an error, following a zero-mean normal distribution. Additionally, observation errors are correlated among committee members.

<sup>18</sup> E.g. stylizing Sibert's (2003) hawks and doves framework.

### Committee Structure

According to the simple diagram introduced at the beginning of this chapter, committee structure is another external feature impacting on its decisions. Berk and Bierut (2005) directed their research on this topic. They find that an appropriate central bank design may allow to overcome the non-optimality of the simple majority as a decision rule<sup>19</sup>. Namely, the committee consisting of the core (with members responsible for preparing the meeting and endowed with information of higher quality) and spokes (regional representatives) can assure efficient decision-making under simple majority rule. Such a structure is clearly influenced by real life examples: the ECB Governing Council and the American FOMC.

The mechanism on which this finding relies is implied by the fact that better informed (or alternatively better skilled) members of the core adopt a common position prior to the meeting. Thus, as all core members vote for the same option, their opinions are *de facto* weighted.

The structure, being one of the exogenous factors influencing the work of the committee, determines also some intrinsic features. Namely, as mentioned and analysed by Berk and Bierut (2003; 2004) in their works, the design of the central bank board influences the interactions taking place between members. Thus, members working in the “core” of the committee have increased possibility to interact and, as mentioned, to learn from each other.

## 4.5. INTERNAL FEATURES

Taking into consideration the specific aspects of decision-making within the MPCs allows for a more detailed research and modelling of the inside-committee interactions. That is, the precise definitions of monetary policy tools (adjusting interest rate) and goals (price stability and possibly fostering growth or, more or less equivalently, fighting unemployment) permit to model information flows (among MPC members) as well as personal and collective preferences. Moreover, this knowledge along with the observation of the macroeconomic performance of the country(s) makes possible the assessment of an MPC efficiency (with respect to achieving the objectives).

### Communication, Learning and Order of Speech

Communication and the related possibility of learning from better skilled individuals were the focus of attention of the second of two of the theoretical works by Berk and Bierut (2004; 2009). They prove that interaction (which is supposed to improve

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<sup>19</sup> As proved by Ben-Yashar and Nitzan (1997).

decision abilities of the less skilled members) may ameliorate the outcome though it occurs at the expense of time of discussion. Thus, there is a trade-off between the discussion time and the committee's size assuring optimal decisions. This result, however, depends on the premise that interaction leads only to improving skills and not to realigning positions (members should vote according to their own information)<sup>20</sup>. This seems also somewhat at odds with their own findings on structure<sup>21</sup>, where they argued that such a design and common position adopted by the “core” members improve the results (see above).

All in all, the research of Berk and Bierut (2003; 2004; 2005) is clearly influenced by the structure of the ECB Governing Council. However, an important number of theoretical advances in modeling monetary policy making by a committee have been inspired by the relative success of the Federal Open Market Committee (FOMC). The American monetary system has been also subjected to extensive empirical research, aiming at confirming different theoretical approaches.

Berk and Bierut (2011) find also that a kind of anti-seniority rule (in spirit of Ottaviani and Sørensen, 2001) should also be applied in a monetary policy context. They propose, somewhat less specifically, that if monetary policy council is relatively homogeneous then proposals to be voted should not be put forward by the chairman but rather should emerge as an outcome of discussions. They document, that this type of practice is indeed applied at the Bank of England or in the Federal Reserve under chairman Bernanke (as opposed to Greenspan, who was known to be “the Maestro”).

### Personal Characteristics of Committee Members

Havrilesky and Gildea (1991) in their critique of Belden's (1989) work underline that the dissenting votes are shaped by three categories of factors: the state of the economy, political (partisan) influences but also (and what is especially important for the present dissertation) training background and career experience. Their probit regression on dissents (0 for tightness and 1 for ease) taking as explaining variables only career and educational characteristics of voters, confirms the significant impact of prestige degree and private banking experience on tighter monetary preferences. However, in this setup they fail to prove the hypothesis that government exercise or Ph.D. make a person more inflation-prone.

In further works Chappell *et al.* (1993; 1995; 1997) as well as Chappell and McGregor (2000) explore dissenting votes by estimating underlying interest rate

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<sup>20</sup> This hypothesis, taking into account the possibility that members are not able to convince each other, leads to the result which is contrary to e.g. Nitzan and Paroush (1985), who argued that communication implies information losses through interdependent voting.

<sup>21</sup> Berk and Bierut (2005).

preferences of FOMC members. The authors follow roughly the same methodology throughout these articles. They assume that these unobserved preferences after a (weighted) averaging are translated into the policy directive. Thus, even if the true desired interest rate remains unobserved, the authors are able to impute them to every policy maker. They estimate reaction functions (which differ with respect to the constant, which demonstrates tighter or easier policy preferences) characterizing different individuals (or their categories such as Federal Reserve Bank Presidents vs. Governors, or, within the latter, Democratic vs. Republican appointees). Moreover, they take into consideration (and estimate) a dissent threshold, which turns out to be relatively large (exceeding 2 percentage points). Policy makers are supposed to react to macroeconomic variables, such as inflation, unemployment, monetary base and industrial production growth or (in extension) presidential signalling. Two of these papers are of special interest, as they indicate (without giving conclusive answers) some of the problems, which came again into the fore in some more recent research.

First, in their 1995 article, the authors argue that a possible reshaping of the Fed<sup>22</sup> might have significant implications for long-term inflation performance. After presenting convincing evidence that regional Reserve Bank Presidents tend to be more “hawkish”, they assess a potential impact of a relative increase of the voting power of Presidential appointees on inflation bias. They find it as large as 3.5 percentage points higher steady-state inflation if all FRB Presidents were replaced by new Governors (which, however, had not been proposed) and 0.8 average inflation increase for the precise case of the reform proposal. A similar case for the reform of the ECB has been undertaken by the European Union in 2003 in order to prepare it for the enlargement of the euro area. This is discussed in details in Stanek (2004).

The second interesting fact, pointed out by Chappell and McGregor (2000), is that policy-maker's gender may also play a role in shaping their preferences. Namely, applying the method above described, they rank all FOMC members who served between 1966 and 1996 in order of their “conservativeness”. They remark that six women (out of seven overall) have been ranked among the 13 members with the highest “preference for ease”, which seems to confirm that female policy makers are on average more “dovish”. This, however, could be influenced by their political affiliation (Democrats are known as monetary “doves” and at the same time are more sensitive to gender equality), which has not been tested by the authors. Nevertheless, research on influences of personal characteristics of MPC members (based on a larger sample of countries) on policy efficiency yielding somewhat different results were led by Farvaque *et al.* (2009; 2011). They show e.g. that women tend to be more

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<sup>22</sup> A project of “Sarbanes and Gonzales bill” was presented to the Congress at the time, aiming at giving more influence to the centrally appointed Governors instead of Federal Reserve Bank Presidents.

hawkish (contrarily to the Chappell and McGregor findings), but also, possibly due to such preferences, might be less efficient in managing aggregate inflation-output volatility (Farvaque *et al.*, 2014).

In recent contributions, Chappell *et al.* (2004; 2005) refine their methodology for the subsample for which minutes of discussion are available. Basing their study on an original dataset, which is derived from the analysis of “Memoranda of Discussion” and the Ford Library Transcripts<sup>23</sup>, they are able to estimate more precise reaction functions for each FOMC member. Analyzing the discussions within the FOMC, they are able to directly observe the desired interest rate of some members. The authors test the hypothesis of a simple majority voting within the FOMC (applying the median voter theorem), a more consensual approach (with the mean of desired interest rates) as well as a chairman's dominance hypothesis and find significant support for a chairman's vote weight as large as 0.48<sup>24</sup>. Nevertheless, mean and median desired federal rates were also significant, which supports the thesis that other members' preferences are important as well.

Other interesting results about chairman's dominance concern the difference in other members' behaviour when they speak before and after the chairman. The average difference between stated desired rates was significantly higher when the other member spoke before Burns, the gap being more important in case of Governors than for Federal Reserve Banks Presidents (which indicates that the latter are more independent)<sup>25</sup>.

The publication of FOMC voting records and discussion transcripts allows for the analysis of individual policy preferences and has been certainly a major determinant (beside the importance and exploit of the Fed in maintaining monetary stability and contributing to the general American prosperity) of the development of research in that field. A similar exercise would be, however, much more difficult in case of other principal central banks, be it because of much shorter time span (as in the case of British MPC, which was inaugurated in 1997)<sup>26</sup> or of lower “procedural transparency”<sup>27</sup>.

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<sup>23</sup> The last published “Memoranda” concern 1976 (they were published with a five-year lag). Thus, the second one (being the originals belonging to Arthur Burns) completes the account of all 99 meetings under Burns' leadership (1970-78).

<sup>24</sup> This value is a simple average of two estimates reported by the authors (0.38 and 0.58).

<sup>25</sup> This result seems to confirm the founding hypothesis of Ottaviani and Sørensen (2001) that a member of a committee who is supposed less skilled does not dare to reveal his personal information if it is contrary to the previously revealed information of a higher-skilled member. Building on such formalized assumption they show that anti-seniority rule allows for a better information accumulation.

<sup>26</sup> Which, however, is not impossible and has been performed by Cobham (2003), Gerlach-Kirsten (2004) or Bhattacharjee and Holly (2010).

<sup>27</sup> This term has been introduced by Eijffinger and Geraats (2006) in their transparency index to encompass explicit strategy, publication of voting record and minutes of policy meetings. In their last

Both of these limitations are true for the European Central Bank, which was inaugurated in 1999 and whose minutes and votes will be published only after a fifty-year lag. This lack of openness can be, however, at least to a certain extent, explained by the necessity of (collective) credibility building and repelling any accusations of (too much/any) weight put on national (regional) considerations<sup>28</sup>. Nevertheless, researchers focusing on the FOMC are endowed with a huge comparative (and absolute) advantage in terms of data availability over those focusing on other central banks.

This does not necessarily mean that some studies focused on other central banks or cross-country studies are not possible. While facing unobservable voting behavior, the attention has been paid directly on policy outcomes. Interestingly, personal features of central bankers in different countries as factors influencing monetary policy has recently entered into the focus of researchers' scrutiny. Thies (2004) put the stress on the fact "that different types of individuals working within different types of institutions achieved different levels of success in attaining price stability during the Asian Crisis." He has studied the impact of "conceptual complexity"<sup>29</sup> of central bankers on their inflation performance during the 1998-2001 financial turmoil and finds that higher levels of complexity are associated with lower levels of inflation. The article, though being eminently stimulating in itself, leaves some doubts on the objectivity of the concept, however. It seems that applying some more objective measures of central bankers' capacities might yield different results.

Göhlman and Vaubel (2007) have presented such preliminary attempts. They investigate the impact of educational backgrounds and past careers of central bankers on inflation. Unsurprisingly, in their (unbalanced) panel data analysis with (two-year) lagged inflation as the explained variable, the authors find a significant impact of professional experience of MPC members. The results of educational background effect on inflation seem less convincing.

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observation (July 2001), only Japan, UK, US and New Zealand were publishing votes and minutes (moreover, in the last case these data are not very valuable, as monetary decisions are taken by the sole Governor).

<sup>28</sup> It is interesting to remark (after Chant, 2003), pointed also out in Eijffinger and Geraats' (2006) index, that among five covered federal countries only the US publish their minutes while four other (monolithic) countries follow full "procedural transparency". Chant (2003) argued also that "the disclosure of minutes and voting records pose significant dangers by creating identifiable regional pressures on monetary policy". For the ECB the same problem was also discussed by Stanek (2004).

<sup>29</sup> The author assesses this personal feature through the analysis of the speeches of central bankers. Direct and simple wording indicates a low level of "conceptual complexity", which may be insufficient to cope with an unusual situation whereas indirect expressions and more complex wording signify a high level of "conceptual complexity" which is a sign of a higher potential of reaction to unpredictable difficulties like financial crisis.

This first (to the best of my knowledge) empirical cross-country time-series study of MPC members' personal features on central bank performance leaves, however, some questions without answers. Namely, institutional design (central bank independence, MPC structure etc.) should also influence inflation performance. The question of preponderance or correlation of either factor remains thus opened. Moreover, the only independent economic variable explaining inflation used in regressions is unemployment, which also leaves some important doubts about their model specification. Similar research on a more recent sample of similar (major) central banks, also yielding interesting results are presented by Farvaque *et al.* (2009; 2011).

Finally, a highly technical vision of interest rate decisions has been presented by Rizzi *et al.* (2003). The authors show that an adaptive fuzzy expert system may perform comparably to a human committee (viz. ECB Governing Council). Nevertheless, a real transfer of monetary policy making to some software neither seems to be politically acceptable in any foreseeable future. Moreover, designing a system, which can (even perfectly) mimic human behaviour or decision-making only in quantitative dimension is not equal to devising a software being able to implement monetary policy. This is obviously not to say that computer aided tools and models are not useful in preparing policy decisions, but it seems that final decisions, as touching the whole human societies, should be taken by human beings.

#### 4.6. CONCLUSIONS

The literature reviewed in this chapter (and summarized in Table 4.1 above) explores in a detailed manner questions concerning monetary policy committees that were conceptualised in the section 4.2 above and in Stanek (2013). On theoretical grounds the most interesting and prone to be modelled are external (size, decision rule and structure) and internal (communication, learning and signal-extracting processes) elements of the monetary policy-making framework. On the empirical side, the most attractive subjects concern internal (i.e. career and education related) and external (i.e. appointment and pressure related) determinants of MPC members behaviour. The lessons that can be drawn from the reviewed literature may be summarized as follows.

First, it seems that committees outperform individuals in decision-making, which is even better documented in case of monetary policy making than in general theory.

That is so, because a more specific context of monetary policy making allows for a better modelling of such decisions. Consequently, the results are more convincing, because they are based on theoretical as well as experimental research. Beside the preference given by all the studies to collective decision making, some offered also arguments supporting the thesis that the number of committee members

is limited, especially under the plausible assumption that expanding the committee is costly. This finding can be found in both general studies and these focused on monetary policy committees. It seems, however, that important further advances may be made in exploring such relations as the linkages between the number of members, their expertise as well as the heterogeneity of the committee.

**Table 4.1.** Main problems of collective decision making in the field of monetary policy

Question	References	Findings
Committee or individual	Cothren (1988)	Committees are a tool guaranteeing stable and “conservative” policy, without unreal assumptions of “ever-living” agents with an infinite horizon of expectations.
	Waller (1992)	Committee with staggered terms assures monetary stability equal to a policy rule
	Sibert (2003)	Committees, clearly outperform individuals in reputation building.
	Blinder (2004)	Committees, because allow for pooling more information and application of more heuristic techniques which makes policy less volatile and moderate.
	Blinder & Morgan (2004)	Committees outperform individuals in term of optimality of the policy with insignificantly lower lag of reaction.
	Lombardelli <i>et al.</i> (2005)	Committees always outperform individuals.
Optimal size	Berk & Bierut (2003)	Limited if additional members are costly and the smaller the bigger are these costs. Optimal size also diminishes if a part of members may interact prior to the meeting.
	Berk & Bierut (2004)	A trade-off exists between the optimal size of the committee and the time required to get the optimal decision.
Decision rule	Gerlach-Kristen (2005)	Too strict majority requirement leads to a suboptimal committee inertia.
	Waller (2000)	Median voter (simple majority rule) assures policy smoothing, which is influenceable by appointments.
	Berk & Bierut (2003)	Unanimity leads to “zero activism” and allows for good decision only if decisional skills of voters are very high.
Committee structure	Berk & Bierut (2005)	Simple majority is suboptimal, but can be eliminated by an appropriate structure ('hub-and-spokes') of the committee.

Influencing the committee decisions and its members' preferences	Havrilesky & Gildea (1991)	Dissent votes (as measured by Belden, 1989) are shaped by three categories of factors: state of the economy, partisan issues and personal experience
	Chappell <i>et al.</i> (1993; 1995; 1997; 2004; 2005), Chappell & McGregor (2000)	FOMC members' votes may be explained by their individual reaction functions (on economic variables), but also by other factors: political affiliations, professional experience, position in the FOMC (Governors vs. FRB Presidents), or potentially other features like gender or age.
	Chang (2003)	Appointments to monetary committee (and thus appointer's preferences) affect policy stance and its future path
	Göhlmann & Vaubel (2007)	Preferences of committee members with regard to inflation are clearly influenced by their educational and career experience
	Farvaque <i>et al.</i> (2011; 2014)	Monetary policy performance depends on professional background, and to a smaller extend on education and demographic features. These features become even more visible under inflation targeting.
	Grier (1991 and 1996), Chopin <i>et al.</i> (1996 a&b)	Incumbent Senate's preferences (and its Monetary Committee's ones) influence FOMC decisions, but the direction is uncertain (disputable).
Communication, interactions, learning...	Berk & Bierut (2004)	Interaction between members is beneficial as a possibility of learning.
	Berk & Bierut (2011)	Options to be voted should not be proposed by an "agenda setter" (chairman) but should rather emerge endogenously according to the views expressed during the meeting.
	Lombardelli <i>et al.</i> (2005)	Interaction between policy makers has no effect on decisions but learning effects are significant.
Alternatives to MPC	Rizzi <i>et al.</i> (2003)	An adaptive fuzzy expert system performs comparably to the ECB Governing Council

Source: own study.

Second, studies concentrated on decision rule yield the conclusion that both most commonly analysed solutions - simple majority (favouring the median voter) and unanimity (granting veto power to each decision maker) - are suboptimal. The truly optimal rule would weigh the decision-makers according to their abilities or, equivalently, according to the quality of information they possess. These general findings are confirmed in the particular context of monetary policy. However, the simple majority rule, assures policy smoothing which seems positive in monetary

policy, and unanimity (as well as too strict majority requirements) leads to suboptimally high policy inertia.

Moreover, the suboptimality of the simple majority rule might be reduced by a suitable committee design: structure or rotation scheme. The latter, however, increases the efficiency of decisions at the cost of incentives to strategic behaviour.

Third, interactions between members positively influence the outcomes, especially because of their important learning effects and reducing conflicting interests. However, here also the abilities matter and the best skilled members should speak later during the meeting.

Finally, empirical studies on monetary policy committees prove that personal preferences matter for the decisions made and that they may be shaped by personal experience, political affiliations, education, demographic features etc.

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