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**Research Report**

## An analysis of central bank decision-making

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# An analysis of central bank decision-making

Maria Demertzis, Catarina Martins and Nicola Viegi

## Executive summary

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**THE PROCESS BY** which central banks take decisions has evolved over the years, with a tendency towards independence and decisions taken by committees rather than individuals. Monetary policy committees can be set up formally in different ways, traditionally falling into one of two categories: individualistic or collegial. Individualistic committees reach decisions by voting and publish the votes of each of their members, while in collegial committees, decisions are typically reached collectively. The European Central Bank is an example of the latter, while the Bank of England follows an individualistic approach.

**FOCUSING ON DECISION-MAKING**, a relevant question is whether the formal set-up in practice leads to different ways of deliberating and reaching monetary policy decisions. We look at decisions taken by the Bank of England, the Federal Reserve and the European Central Bank over more than 20 years to evaluate how different the decision-making process is in these three central banks. The results indicate that, irrespective of the committee type, their approach to consensus building when they take decisions is similar.

**THE THREE CENTRAL** banks seem to value reaching decisions by unanimity, both on interest rates – the prime monetary policy instrument by definition – and on asset purchases. Decisions to tighten monetary policy are more often taken unanimously than decisions to ease monetary policy. When maintaining policy unchanged, decisions are usually backed by most committee members.

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# 1 Introduction

The way central banks take monetary policy decisions has evolved over the years. One important shift has been the assigning of monetary policy decisions to a committee rather than to one individual. In May 1997, then Chancellor of the Exchequer Gordon Brown granted the Bank of England operational independence, in other words, the independence to decide how to achieve price stability. By contrast, the Bank was not granted target independence; the definition of price stability, the inflation target, remained with the government. Under the Bank of England Act (see Rodgers, 1998), which came into force on 1 June 1998, the Monetary Policy Committee (MPC) decides on the monetary policy measures to achieve the inflation target. The act specified the composition of the MPC as the Bank of England Governor, two Deputy Governors, two members appointed by banks, and four external members appointed by the Chancellor.

In the case of the European Central Bank, its establishment in January 1999 as a centralised body responsible for monetary policy was contemporaneous with the introduction of the euro as an official currency in 11 EU countries. The responsibility for monetary policy was then transferred from each of the central banks of those countries to the ECB. Since then the number of euro-area countries has expanded to 19. The governors of the euro-area national central banks still have a say in monetary policy decisions since the ECB Governing Council comprises the governors of each national central bank in addition to six members of the ECB Executive Board.

The Federal Reserve System (Fed), created in 1913 with the Federal Reserve Act, started as a system of 12 Reserve Banks operating independently. As the United States economy became more integrated, more collaboration and coordination were needed, resulting in convergence on more centralised decision-making. Revisions to the Federal Reserve Act in 1933 and 1935 led to the creation of the Federal Reserve Open Market Committee (FOMC), which is still today the Fed's monetary policy decision-making body. The FOMC is composed of the members of the Board of Governors – nominated by the President of the United States and confirmed in their positions by the US Senate – and the Bank Reserve presidents.

In 2022, the Bank of England MPC celebrates 25 years and we use this occasion to compare its decision-making process to that of the European Central Bank and the Federal Reserve.

## 2 What makes an effective decision-making process?

Table 1 summarises some of the core elements of the decision-making process at the Bank of England (BoE), the European Central Bank (ECB) and the Federal Reserve Board (Fed). The pursuit of price stability by a committee is by now the standard in central banking.

**Table 1: The decision-making process in three main central banks**

	Bank of England	European Central Bank	Fed
Decision-making			
Decision-making body	Monetary Policy Committee (MPC)	Governing Council	Federal Open Market Committee (FOMC)
Number of members	9	25	12
Composition of the decision-making body	The Governor + 3 Deputy Governors + the Chief Economist + 4 external members	6 members of the Executive Board + the governors of the national central banks of the 19 euro-area countries	7 members of the Board of Governors + the president of the Federal Reserve Bank of New York + 4 of the remaining 11 Reserve Bank presidents (1-year term on a rotating basis)
Gender distribution	7 male + 2 female (both external members)	23 male + 2 female (both in Exec Board)	5 male + 5 female**
Nationalities	Mixed but mostly British	All euro-area nationalities	US citizens
Who has the right to vote	All 9 members of the MPC	6 Exec Board members vote permanently + 15 votes from 19 NCB Governors (monthly rotating basis*)	The 12 members of the FOMC (yearly rotation for the RB presidents***)
Reaching a decision	Voting	Collegial	Voting
Disclosure of voting	Yes	No	Yes
Frequency of meetings	8 times a year	Every six weeks (~ 8 times a year)	Typically, 8 times a year

Source: Bruegel. Notes: The composition described is for 2022, not historical. \*ECB rotating voting: since 2015, there are 15 votes gathered from the 19 National Central Bank Governors on a monthly rotating basis. There are 2 groups of countries: big (4 votes) and small (11 votes). All (6+19) participate in the discussions. \*\*In view of resignations and no replacement up to this point, the numbers do not add up to the expected 12 FOMC members. \*\*\*Note that all 12 Reserve Bank presidents attend FOMC meetings and participate in the discussions.

The move towards committees somewhat coincided with the shift to central bank independence (Blinder, 2007) in the late twentieth century. This was a natural consequence of central banks no longer taking orders from their governments, but being given the operational independence to pursue pre-defined economic objectives, generally inflation related. Members of committees then needed to pool the information that would help them make good decisions in uncertain circumstances – a necessary step when performing complex tasks like monetary policy. The move towards central bank independence was crucial to ensure politically-independent and goal-oriented conduct of monetary policy. The more long-term orientation and objectivity of monetary policy's goals – contrasting with the shorter-term nature of political cycles and political bias to inflate the economy – proved beneficial to price stability, with more credible signals helping to manage inflation expectations (Bernanke, 2010; Haldane, 2020).

But decision-making by committees is not identical in all central banks (Blinder, 2007). Broadly speaking, central bank committees fall into two categories: individualistic, in which each member expresses his or her own opinion and votes accordingly, and collegial, in which members reach decisions collectively and stand by them. The Bank of England is an example of the former. An individualistic system is built on the diversity of views and aims to reduce the risk of group thinking. On the other hand, however, when votes are split, they face the

**Having clear objectives, efficient instruments and independence are of prime importance to committee effectiveness**

challenge of communicating effectively to the public the rationale behind any decision. The ECB, by contrast, has a collegial-based system, in which decisions reached are presented as decisions of the whole decision-making body. The emphasis is on communicating one view and therefore claiming ownership by all who participate. In the case of the Fed, while the FOMC members vote and those votes are then published, a statement is issued in the name of the FOMC and the final decision is embraced by all members. Hence, it is a collegial type of committee, though different from the ECB.

Many attempts have been made in the literature to identify what makes a committee effective. Having clear objectives, efficient instruments and independence are of prime importance (Maier, 2010). A manageable size, not much larger than five members, is also viewed as preferable (Hansen *et al*, 2014). However, restricting the size is not always possible. Berger *et al* (2008) looked at a sample of 84 central banks around the world and verified that the size of decision-making bodies was around seven to nine members. It seems that MPC size increases with country size, population heterogeneity and with democratic political regimes. In cases where committees have a large number of members, a rotation system may help combine a manageable size with bringing in more information (Maier, 2010). However, as it becomes harder to evaluate the effort put into individual contributions in larger committees, members may feel tempted to free-ride or shirk and end-up contributing less to the pooling of information. A system that identifies members' contributions may help reduce this risk, leading to higher quality of contributions and resulting in more effective information collection to better inform monetary policy decisions. The diversity of members' backgrounds, for example in the form of internal and external members, also adds to the information set and can help avoid extreme ideas or group thinking.

Linked to the two types of committee decision-making is the role of statements and minutes as part of the communication process. Individualistic committees use minutes a lot more as a way of communicating both decisions reached and points of disagreement. Detailed statements, on the other hand, are a more effective tool in collegial central banks. As Paul Tucker, a former BoE MPC member, put it, this is because *"it is more difficult for us than for some of our peers to release an informative statement immediately after the policy meeting: if you don't know what you're going to decide, it is pretty hard to prepare a draft in advance."* (Tucker, 2008).

A number of studies have examined how the characteristics of members of monetary policy committees affect decision-making. The literature that investigates the Fed's Federal Open Market Committee (FOMC) looks at educational and career characteristics and differences in behaviour between political appointees (such as the Governor who is appointed by the US president) and bank presidents. Eichler *et al* (2018) found that FOMC members who have a financial industry background or represent a region with a large banking sector are more sensitive to local banking instability. Smales and Apergis (2016) found that the tenure of the FOMC Chair and their experience in Government lead to more dovish decisions. By contrast, the longer the period working as bank staff, the greater the preference for hawkish decisions. Internal disagreements are very much attributed to the background characteristics of FOMC members and to political influence (Bennani *et al*, 2018).

Authors who study the workings of the Bank of England's MPC have also analysed the relevance and importance of dissent. Given the set-up of the MPC, many have studied how the distinction between internal and external members plays out. Harris *et al* (2011) showed that external members are more likely to dissent when the MPC's inflation forecast deviates from the target. Gerlach-Kristen (2009) argued that insiders typically attach greater weight to inflation stabilisation than external members, who are more dovish. Gerlach-Kristen (2009) attributed this to the fact that externals are appointed (and potentially re-appointed) by the Governor, which gives them an incentive to be more *"recession averse"*. Harris and Spencer (2009) showed that insiders tend to vote as a bloc and are typically on the winning side of policy decisions, given their numeric superiority. Hansen *et al* (2014) also found that internal MPC members have superior expertise compared to externals, which casts some doubt on

the value-added of external members. However, Hansen *et al* (2014) and others, particularly Downward and Mearman (2007) pointed to the importance of triangulation, or the use of diverse sources of information to inform decisions. Such diverse sources could range from different methods and data to different theories and investigators.

Last, other streams of literature have focused on different aspects including the relevance of nationality, particularly in the context of the ECB, and gender. Badinger and Nitsch (2011) studied the ECB and showed that indeed beyond a certain management level, nationality does affect the formulation of monetary policy. The issue of gender has been subject to growing attention and an increasing number of studies examines to what extent gender affects monetary policy decisions. Rieder (2021) showed that there is mixed evidence in the literature and advises caution given the current small proportion of women in the samples used to investigate this topic.

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### 3 Individualistic vs collegial: are they really that different?

While many attempts have been made to understand what makes an efficient decision-making set-up, much less is known and understood about why central banks might opt for one system or the other.

The reasons often probably have little to do with what is known about optimal design and more to do with culture or broader political economy contexts. Malmendier *et al* (2021) showed that differences between FOMC members' inflation expectations and Fed staff forecasts can be explained by personal lifetime experiences of inflation and do affect voting outcomes.

Arguably, this link between preferences and experience is why the ECB opted to pursue a consensus model in its decision-making (Claeys and Linta, 2019). The idea was that if the ECB was to speak for the euro area, as indeed dictated by its mandate, then it had to ignore national preferences. And to be able to convince the public, it would have to speak with one voice. The decision-making process and the communication of decisions would therefore not provide any information on disagreements or the extent of consensus. Also, even if the optimal size of a committee is shown to be around five members, the ECB could not afford to not include all national central banks in its decision-making body.

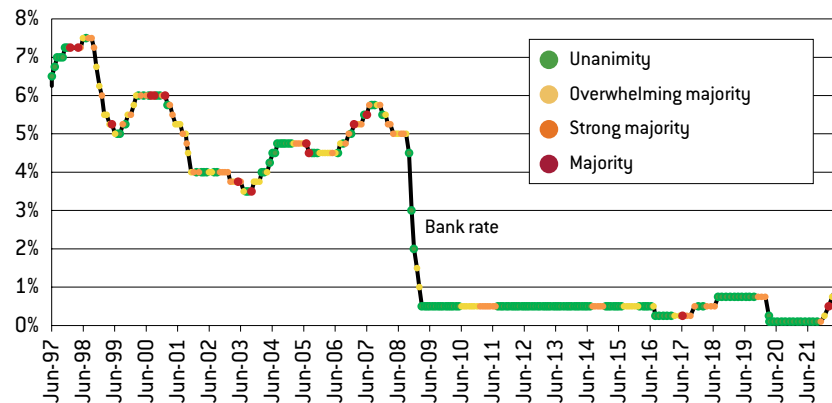
The question then is whether the set-up of any given committee actually leads to very different ways of deliberating. Ehrmann and Fratzscher (2007) showed that there is not a single best approach for central banks to adopt. Different ways of combining more or less individualistic communication and decision-making strategies may deliver similarly good results in terms of responsiveness of financial markets and predictability of policy decisions. Similarly, Riboni and Ruge-Murcia (2010) looked at five different central banks (BoE, ECB, Fed, Bank of Canada and the Swedish Riksbank) and concluded that, despite having different formal committee types, all central banks seem to follow a consensus model in the way they take actual interest-rate decisions. We take a closer look at the way the BoE, the Fed and the ECB reach decisions and confirm that, irrespective of the set-up, their approach to consensus building when they make decisions is similar.

Figure 1 plots all rate decisions since the late 1990s taken by the Bank of England, the Fed and the ECB. Also, we report the degree of agreement reached in each decision. Data is available for the Bank of England and for the Fed as votes are published after each meeting, but not for the ECB, since it does not publish votes. Hence, we rely on the methodology of Claeys and

Linta (2019), who gathered information from various sources on how decisions were taken<sup>1</sup> (see the annex for a detailed explanation of the methodology and classifications used in this paper).

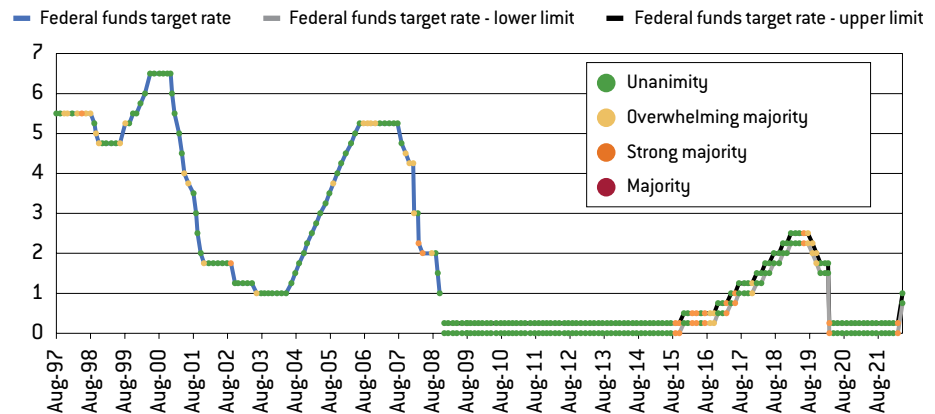
We observe that at the current juncture, the BoE faces greater disagreements than during earlier times. The same is not so evident for the Fed or the ECB. This could be explained by the early action on interest rate hikes taken by the BoE since end-2021 as a response to the surge in inflation, while the Fed took action to increase its Federal Funds target range only in March 2022 and the ECB still hasn't taken any action on that front.

**Figure 1a: Bank of England MPC voting decisions on the bank rate**



Source: Bruegel based on Bank of England. Notes: period from June 1997 to May 2022. Unanimity = all votes in support; Overwhelming majority = all – 1 one vote; strong majority = between strong majority (all-1) and majority; majority = half + 1 votes in support.

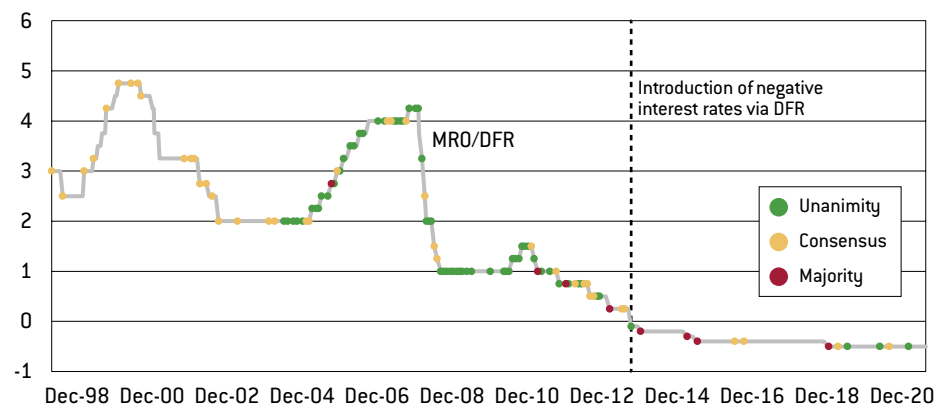
**Figure 1b: Fed FOMC voting decisions on the Federal Funds target rate/range**



Source: Bruegel based on Federal Reserve. Notes: period from Aug 1997 to May 2022. Until Oct 2008, the FOMC defined a target rate for the Federal Funds Rate. From Dec 2008, the FOMC defined a target range with an upper and lower limit within which the effective Federal Funds rates could fluctuate. Unanimity = all votes in support, Overwhelming majority = all - 1 one vote, Strong majority = between strong majority (all-1) and majority, Majority = half + 1 votes in support.

<sup>1</sup> These include the transcripts of the press conferences following the Governing Council 'monetary policy' meetings which also include transcripts of the Q&A with journalists, and, since 2015, the 'accounts', i.e., the summaries of the discussion of the monetary policy meetings published by the ECB. Exceptional press releases may also be considered.

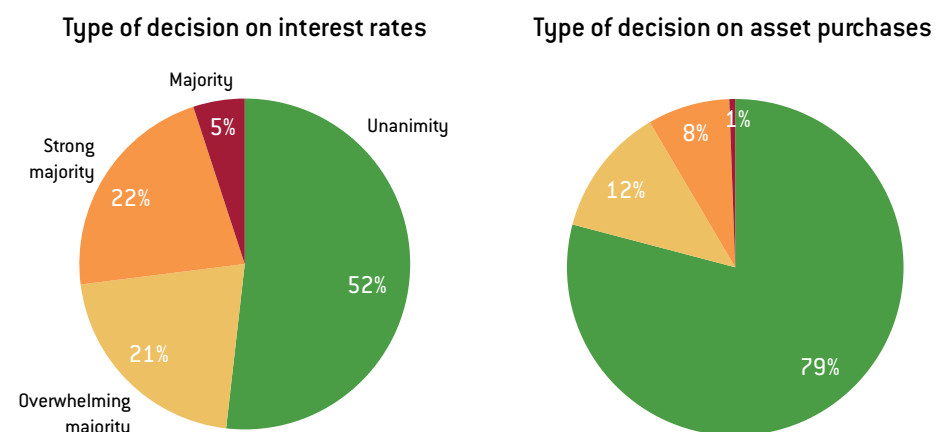
**Figure 1c: ECB Governing Council voting decisions on the main refinancing rate and deposit facility rate**



Source: Bruegel based on ECB. Notes: period from Dec 1998 to May 2022. Before 5 June 2014, the rate plotted corresponds to the MRO, after that to the DFR. The classification of the decision was made according to what was indicated by the ECB president in press conferences and by the monetary policy accounts, based on Claeys and Linta (2019).

For nearly two-thirds (61 percent) of ECB meetings, we have no information on the degree of consensus reached for interest-rate decisions. Figure 2 summarises the degree of disagreement during deliberations of the three central banks, differentiating between decisions on interest rates and asset purchases. Despite the ECB decision-making process relying on consensus, the degree of unanimity reached is quite similar to that of the Bank of England when it comes to interest-rate decisions. Out of the three banks, the Fed reaches rate decisions with unanimity most often (around 80 percent of the time). When it comes to unconventional measures, in this case asset purchases, the BoE and the Fed show similar patterns. The members of these two banks reach unanimity much more frequently than the ECB. That is to be expected because when it comes to asset purchases, the ECB buys a much wider portfolio of bonds with different risks.

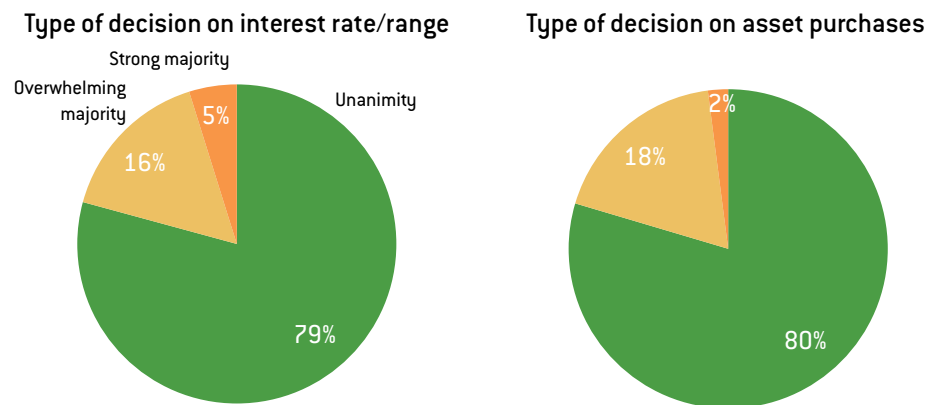
**Figure 2a: Bank of England MPC bank rate and asset purchases decisions**



Source: Bruegel based on Bank of England. Notes: period from June 1997 to May 2022. Unanimity = all votes in support, Overwhelming majority = all - 1 one vote, Strong majority = between strong majority (all-1) and majority, Majority = half + 1 votes in support.

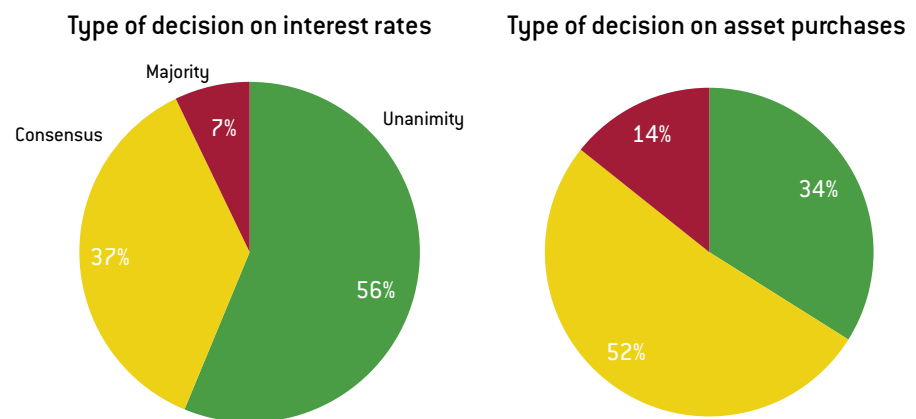


**Figure 2b: Fed FOMC Federal Funds target and asset purchases decisions**



Source: Bruegel based on Federal Reserve. Notes: period from Aug 1997 to May 2022. Unanimity = all votes in support, Overwhelming majority = all - 1 one vote, Strong majority = between strong majority (all-1) and majority, Majority = half + 1 votes in support.

**Figure 2c: ECB Governing Council interest rates and asset purchases decisions**



Source: Bruegel based on ECB and Claeys and Linta (2019). Notes: period from Dec 1998 to May 2022. The classification of the decision was made according to what was indicated by the ECB president in the press conferences and by the monetary policy accounts. Note that, for the BoE chart we show decisions on bond purchases, while for the ECB "other" includes more policies, e.g. forward guidance or credit operations.

The one characteristic the three central banks share is that they reach tightening interest rate decisions more often by unanimity than easing decisions (Figure 3). We can also see that, when it comes to maintaining the policy unchanged, the decision is backed usually by most members.

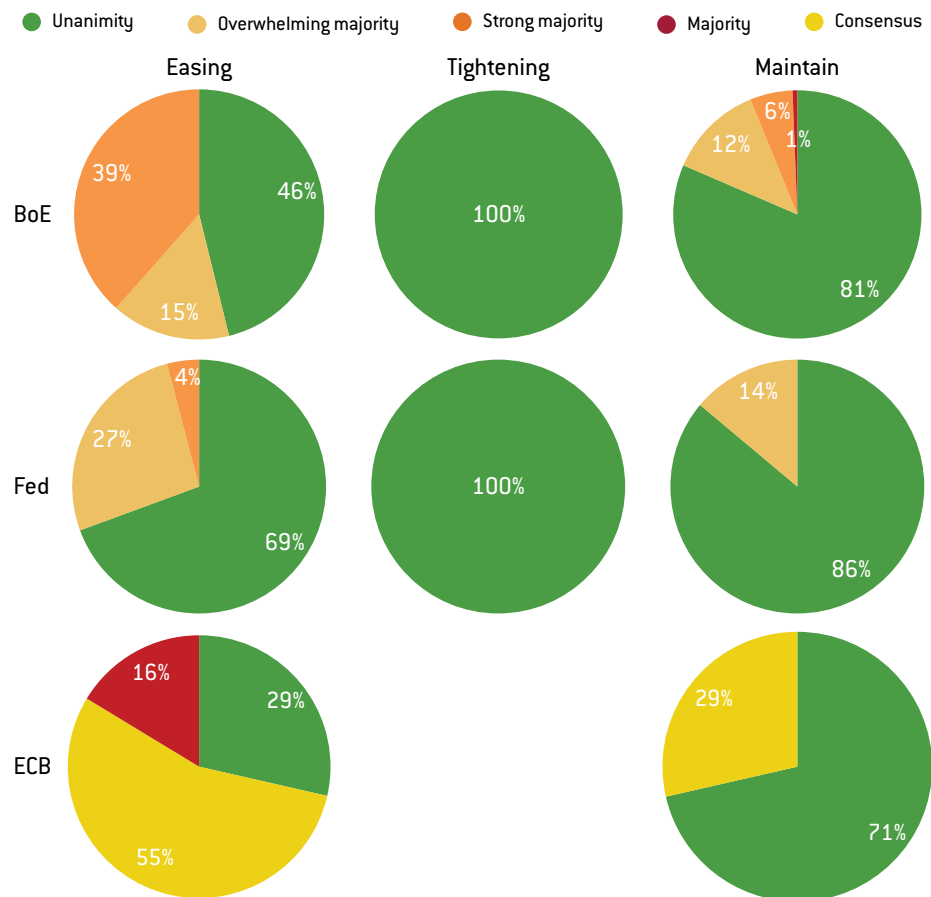
Regarding asset purchases, as Figure 4 shows, there is a limited historical record on tightening decisions. This is not surprising given that unconventional tools have been only relatively recently deployed by the three central banks. Comparing easing decisions with those on maintaining the size of the balance sheet, we still see more agreement on the latter. The distribution of the levels of agreement is very similar to that on decisions on interest rates.

**Figure 3: Level of disagreement and direction of policy move – for interest rates**



Source: Bruegel based on BoE, Fed and ECB. Notes: period from June 1997 to May 2022 for BoE, from Aug 1997 to May 2022 for Fed, from Dec 1998 to May 2022 for ECB. For the ECB, the classification of the decision was made according to what was indicated by the ECB president in the press conferences and by the monetary policy accounts.

**Figure 4: Level of disagreement and direction of policy move – for asset purchases**



Source: Bruegel based on BoE, Fed and ECB. Notes: period from June 1997 to May 2022 for BoE, from Aug 1997 to May 2022 for Fed, from Dec 1998 to May 2022 for ECB. Only decisions with regards to asset purchases were considered. For the ECB, the classification of the decision was made according to what was indicated by the ECB president in the press conferences and by the monetary policy accounts. For the BoE and the Fed, the pies for tightening reflect 2 decisions each.

## 4 Conclusions

Central bank monetary policy decisions are generally taken by committees, independently from governments. The formal set up of these committees varies and so does the way of deliberating. Some vote; others seek consensus. A relevant question is whether the committee type in practice leads to differences in how members reach monetary policy decisions. Based on an analysis of the Bank of England, the Federal Reserve and the European Central Bank, we conclude that the three banks value reaching decisions by unanimity. This result is more pronounced for tightening than for easing decisions; tightening decisions are more often taken by unanimity. This is perhaps not surprising given the impact central bank actions have on the economy. Central banks want to provide clear signals in order to be convincing.

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## References

- Badinger, H. and V. Nitsch (2011) 'National Representation in Multinational Institutions: The Case of the European Central Bank' Working Paper 3573, CESifo *Working Papers*, available at <https://www.ssrn.com/abstract=1927820>
- Bennani, H., T. Kranz and M. Neuenkirch (2018) 'Disagreement between FOMC Members and the Fed's Staff: New Insights Based on a Counterfactual Interest Rate', *Journal of Macroeconomics* 58: 139–53, available at <https://doi.org/10.1016/j.jmacro.2018.09.002>
- Berger, H., V. Nitsch and T. Lybek (2008) 'Central Bank Boards around the World: Why Does Membership Size Differ?' *European Journal of Political Economy* 24(4): 817–32, available at <https://doi.org/10.1016/j.ejpoleco.2008.04.003>
- Bernanke, B.S. (2010) 'Central Bank Independence, Transparency, and Accountability', speech to the Institute for Monetary and Economic Studies International Conference, Bank of Japan, Tokyo, Japan, 25 May, available at <https://www.federalreserve.gov/newsevents/speech/bernanke20100525a.htm>
- Blinder, A.S. (2007) 'Monetary Policy by Committee: Why and How?' *European Journal of Political Economy* 23(1): 106–23, available at <https://doi.org/10.1016/j.ejpoleco.2006.01.003>
- Claeys, G. and T. Linta (2019) 'The Evolution of the ECB Governing Council's Decision-Making', *Bruegel Blog*, 27 June, available at <https://www.bruegel.org/2019/06/the-evolution-of-the-ecb-governing-councils-decision-making/>
- Downward, P. and A. Mearman (2007) 'Decision-Making at the Bank of England: A Critical Appraisal', *Oxford Economic Papers* 60 (October): 385–409, available at <https://doi.org/10.1093/oeq/gpn009>
- Ehrmann, M. and M. Fratzscher (2007) 'Communication by Central Bank Committee Members: Different Strategies, Same Effectiveness?' *Journal of Money, Credit and Banking* 39(2–3): 509–41, available at <https://doi.org/10.1111/j.0022-2879.2007.00034.x>
- Eichler, S., T. Löhner and F. Noth (2018) 'Regional Banking Instability and FOMC Voting', *Journal of Banking and Finance* 87: 282–92, available at <https://doi.org/10.1016/j.jbankfin.2017.10.011>
- Gerlach-Kristen, P. (2009) 'Outsiders at the Bank of England's MPC', *Journal of Money, Credit and Banking* 41(6): 1099–1115, available at <https://doi.org/10.1111/j.1538-4616.2009.00248.x>
- Haldane, A. (2020) 'What Has Central Bank Independence Ever Done For Us?' speech to the UCL Economists' Society Economics Conference, 28 November, available at <https://www.bankofengland.co.uk/-/media/boe/files/speech/2020/what-has-central-bank-independence-ever-done-for-us-speech-by-andy-haldane.pdf>
- Hansen, S., M. McMahon and C. Velasco Rivera (2014) 'Preferences or Private Assessments on a Monetary Policy Committee?' *Journal of Monetary Economics* 67: 16–32, available at <https://doi.org/10.1016/j.jmoneco.2014.06.004>
- Harris, M.N., P. Levine and C. Spencer (2011) 'A Decade of Dissent: Explaining the Dissent Voting Behavior of Bank of England MPC Members', *Public Choice* 146 (3): 413–42, available at <https://doi.org/10.1007/s11127-010-9597-6>
- Harris, M.N. and C. Spencer (2009) 'The Policy Choices and Reaction Functions of Bank of England MPC Members', *Southern Economic Journal* 76 (2): 482–99, available at <https://doi.org/10.4284/sej.2009.76.2.482>
- Maier, P. (2010) 'How Central Banks Take Decisions: An Analysis of Monetary Policy Meetings', in P.L. Siklos, M.T. Bohl and M.E. Wohar (eds) *Challenges in Central Banking*, Cambridge: Cambridge University Press, available at <https://doi.org/10.1017/CBO9780511762802.011>
- Malmendier, U., S. Nagel and Z. Yan (2021) 'The Making of Hawks and Doves', *Journal of Monetary Economics* 117: 19–42, available at <https://doi.org/10.1016/j.jmoneco.2020.04.002>

- Riboni, A. and F.J. Ruge-Murcia (2010) 'Monetary Policy by Committee: Consensus, Chairman Dominance or Simple Majority?' *The Quarterly Journal of Economics* 125(1): 363–416
- Rieder, K. (2021) 'Monetary Policy Decision-Making by Committee: Why, When and How It Can Work,' *European Journal of Political Economy*, August, 102091, available at <https://doi.org/10.1016/j.ejpoleco.2021.102091>
- Rodgers, P. (1998) 'The Bank of England Act,' *Quarterly Bulletin* Q2, Bank of England
- Smales, L.A., and N. Apergis (2016) 'The Influence of FOMC Member Characteristics on the Monetary Policy Decision-Making Process,' *Journal of Banking & Finance* 64 (March): 216–31, available at <https://doi.org/10.1016/j.jbankfin.2015.12.002>
- Tucker, P. (2008) 'Remarks on "Making Monetary Policy by Committee"', *Quarterly Bulletin* 48 (No. 3): 347–50, Bank of England

## Annex

### Details on the methodology for the classification of level of disagreement

For the Bank of England MPC and for the Federal Reserve FOMC, the classification of the level of disagreement was done based on publicly available voting information. For both central banks, we created four categories:

- Unanimity: when all members voted in favour of the policy decision;
- Overwhelming majority : when all members except one voted in favour of the policy decision;
- Strong majority: when the number of votes in favour of the policy decision was between Overwhelming majority and majority;
- Majority: when half of the members plus one voted in favour of the policy decision.

For the ECB Governing Council, the classification of the level of disagreement was derived from information found on transcripts of press conferences following the Governing Council monetary policy meetings, which also include transcripts of the Q&A with journalists, and, since 2015, the accounts, ie the summaries of the discussion of the monetary policy meetings published by the ECB. Exceptional press releases may also be considered. We followed the methodology and classification proposed in Claey's and Linta (2019), which has three categories that can be described as follows:

- Unanimity: all members of the Governing Council agree on the policy decision;
- Consensus: the policy decision is supported by the entire Governing Council, by some more enthusiastically than others, but this does not require a vote;
- Majority: some members disagree and a vote might be needed.

### Details on the methodology for the classification of direction of the policy

To classify the direction of the policy, we adopted the commonly used jargon in central banking: 'easing' when the policy is meant to stimulate the economy and bring inflation up when it is below target, and 'tightening' when the policy acts as a break to economic overheating and aims to reduce inflation that is above target. There is also a third category 'maintain' for the cases in which there is no change in the policy.

For central banks' rates, the classification was straightforward:

- Easing: Decrease in rate;
- Tightening: Increase in rate;
- Maintain: No change in rate.

In the case of the Bank of England, we looked at the bank rate. For the Fed, we considered the target the FOMC established for the Federal Funds rate – first a target rate (until October 2008) and then a target range with an upper and lower limit (from December 2008). In the case of the ECB, until June 2014 we considered moves in the main refinancing operations (MRO) rate. Thereafter, we looked instead at moves in the deposit facility rate (DFR), since it was the rate that moved into negative territory and since then has become a reference.

For asset purchases, the classification was done according to what the policy decision implied for the size of the central bank's balance sheet:

- Easing: increase in the balance sheet size;
- Tightening: decrease in the balance sheet size;
- Maintain: keeping the balance sheet size unchanged.

An increase in the balance sheet is traditionally done via net asset purchases. A decrease in the balance sheet is typically associated with net sales of assets ('tapering'). To maintain the size of the balance sheet central banks typically deploy reinvestment policies.