The Consequences of Gender Diversity at the Federal Reserve: An Empirical Analysis of FOMC Voting and Discourse[*]

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Abstract

What are the consequences of gender diversity on monetary policy committees? Despite global efforts to diversify monetary policymaking committees, the existing research is mixed with respect to the ways in which gender affects the conduct of monetary policy. While early research examining voting on monetary policy committees suggests women are more inflation-tolerant than their male colleagues, more recent research has found just the opposite, describing female central bankers as more inflation-averse. Drawing on over fifty years of voting records and transcripts from the Federal Open Market Committee, I provide evidence that gender diversity affects policymaking, but not in the ways the extant literature suggests. Using matching methods to account for differences in career backgrounds and the party of the appointing president, I show that once such individual differences are accounted for, there is no evidence women on monetary policy committees vote differently from their male colleagues. However, the final vote is only one avenue through which policymakers stand to influence outcomes. Turning to the topical content of individual speeches during committee deliberations, I demonstrate female policymakers focus disproportionately on issues of output and employment compared to inflation and price stability.

An extensive body of political economy research examines the determinants of voting behavior on monetary policy committees at central banks. Scholars have convincingly demonstrated the ways in which central bankers' career and education backgrounds (Göhlmann and Vaubel 2007; Adolph 2013) as well as age (Malmendier, Nagle and Yan 2019) and regional affiliations (Meade and Sheets 2005) shape individuals' conduct of policy on monetary policy committees. Taken together, this line of research has contributed to a growing consensus that central bankers are not the ideologically homogenous decision-makers they were previously imagined to be. Once conceived of as uniformly conservative benevolent social planners, it is now widely accepted that central bankers' preferences — and thus their committees' monetary policy outcomes — are driven by a variety of individual-level predictors that shape monetary policy strategies.

Until recently, however, the role of gender in the conduct of monetary policy has been comparatively under-examined. This is true both in comparison to other predictors of central bankers' voting behavior as well as in comparison to the substantial research on gender in other policymaking institutions. One perhaps obvious explanation for the lack of attention scholars have given to gender in the realm of central banking is the strikingly low levels of gender representation on monetary policy committees.[1] Historically, studying the consequences of gender in this setting has been both low-priority and difficult given the small number of female central bankers. Because of this, much of the often-cited evidence on the consequences of gender for monetary policymaking stems from the inclusion of gender in a larger predictive model of voting behavior without due attention to theory or the challenges of drawing inferences given the limited sample sizes at hand. Unsurprisingly, this approach to understanding gender in the context of central banking has generated a variety of mixed results. For example, extant research examining the Federal Open Market Committee (FOMC) of the US Federal Reserve (Fed) has suggested women are both more inflation tolerant (Chappell and McGregor 2000;

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[1]As Lamo (2019) noted during a 2019 joint conference between the Federal Reserve (Fed), Bank of England (BoE), and European Central Bank (ECB), "the underrepresentation of women is perhaps nowhere as visible as in central banks."

Chappell, Mcgregor and Vermilyea 2004; Malmendier, Nagle and Yan 2019) and inflation averse (Farvaque, Hammadou and Stanek 2010; Bennani, Farvaque and Stanek 2018), with little effort to understand the source of such incompatible findings.

This article contributes to a growing literature examining the consequences of gender for monetary policy preferences. Focusing specifically on gender differences in the conduct of monetary policy at the Fed, the contributions of this article are three-fold. First, I present and test a theory that offers an explanation for the discrepancies in the extant research on monetary policy committee voting records. I demonstrate that in part due to the small samples of female central bankers available to scholars as well as the nature of the appointment process which generates these observations, the conflicting results can be explained by covariates known to affect individual monetary policy preferences that correlate with gender differently during the various time periods extant research has focused. Specifically, I highlight the importance of accounting for both the party of the appointing president and the career backgrounds of individual central bankers. While neither of these predictors are novel in the extant literature on monetary policy preferences and voting behavior, both are critical to how we use the observational data we have to understand gender's role in the conduct of monetary policy. Second, after using coarsened exact matching to account for covariate imbalance, I demonstrate for the entire sample of FOMC votes from 1966 to 2019 that female central bankers do not vote differently than their male colleagues. That is, the existing and variable effects of gender cited in the extant literature appear to be artifacts of the sample populations and data generating processes.

However, that there are no discernible differences in monetary policy voting behavior across genders does not imply that gender does not matter for monetary policy preferences and strategies. To the contrary, I join a growing literature that challenges the use of Fed voting records to understand individual policy preferences (Schonhardt-Bailey 2013; Gardner and Woolley 2016; Baerg and Lowe 2020). Given the low rates of dissent on final votes and norms of consensus on monetary policy committees, any analyses of these voting records inevitably understates differences in policy preferences among committee members. This issue

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is further exacerbated in analyses examining the presence of gender differences given the findings from Lähner (2018) that show women even more so than their male colleagues are likely to vote in favor of a majority-supported policy that is inconsistent with their stated preferences. Thus, setting aside the results of final votes, I turn to the analysis of verbatim transcripts from FOMC rate-setting meetings to examine differences in the discourse of male and female policymakers. Drawing recent methodological advances in the analysis of this textual data developed in Baerg and Lowe (2020), I generate novel estimates of the topical content of each committee members' contribution to the debate. With this data I show that while female central bankers do not cast votes differently than their male colleagues, they do disproportionately discuss issues relating to output and employment while their male colleagues focus more on issues surrounding inflation and price stability.

Taken together, the results presented here indicate gender does appear to affect the monetary policymaking process, but not in the ways the extant literature suggests. In addition to resolving a debate concerning the consequences of gender for voting on monetary policy committees, these results emphasize two issues for the growing literature on gender and central banking. First, they imply a previously unappreciated consequence for the increased efforts to promote gender diversity at central banks. Specifically, as the proportion of seats on monetary policy committees held by women increases, these results suggest committee deliberation is likely to focus more so on monetary policy as it relates to output and employment considerations rather than price stability. I leave for future research an examination of how this affects monetary policy outcomes, the committees' communication with markets, and various metrics of economic performance. Second, while the empirical findings presented here speak directly to monetary policymaking at the Fed, they have broader implications for the study of gender and central banking in a comparative context. On the one hand, scholars examining characteristics like gender ought to theorize harder about the relevant components of such a complex composite variable. The theory and methods employed here provide a first, but not final, step towards our understanding of how one's gender affects the conduct of monetary policy. Further, the results highlight why a null-finding with respect

to gendered difference in voting records should not be interpreted as meaning gender does not matter. The Fed's uniquely transparent policy of publishing verbatim transcripts allows us to observe one of perhaps many ways in which female central bankers affect the policymaking process that would not manifest as dissenting votes. While such an analysis of monetary policy discourse is not replicable in other contexts due to the availability of such transcripts, the findings warn against inferring gender differences – or lack thereof – from voting records alone.

Monetary Policymaking at the FOMC

Before turning to a discussion of gender in central banking, I provide a brief review of decision-making at the Fed to highlight two contextual features critical to the research design at hand. Specifically, I wish draw attention to the nature of the appointment process by which central bankers are selected as well as the FOMC's internal decision-making procedures. Since the Banking Act of 1935 consolidated monetary authority at the Fed in Washington, the FOMC has maintained control over the conduct of monetary policy. The FOMC meets a minimum of eight times a year for rate-setting meetings in which the committee members vote by majority rule to set the target Federal Funds rate, the central bank's primary instrument of monetary policy.

The twelve-member FOMC is composed of a combination of individuals serving on the Board of Governors (BoG) and as Presidents of the twelve regional banks, each of whom are selected by different principals to serve distinct roles and purposes on the committee. Governors serving on the BoG are Senate-confirmed, presidential appointments who hold permanent voting rights on the FOMC for the duration of their non-renewable 14-year terms.[2] From this set of seven Governors, the President selects (subject to Senate-confirmation) individuals to serve as the Chair and Vice Chair of the FOMC for renewable, four-year terms. The five remaining seats on the FOMC are filled by a rotating cast of the twelve

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[2]While a complete term on the BoG is 14 years, a new term begins at a fixed interval every two years. Often an individual is appointed to serve the duration of an incomplete, 14-year term. When appointed to an incomplete term, individuals can be reappointed to a second complete term.

Reserve Bank Presidents. Presidents are selected by the leadership of their regional banks, subject to the approval of the BoG. While the President of the regional bank in New York holds a permanent vote on the FOMC, the other eleven regional banks share the remaining four voting seats in rotating, one-year terms. While many presidents only cast votes during rate-setting meetings every two- or three-years, they are permitted to attend and participate in deliberations regardless of whether they currently hold a voting position or not.

With several notable exceptions, much of the extant empirical work on US monetary policymaking focuses on voting records from the FOMC's rate-setting meetings. At the end of each rate-setting meeting, the chair puts forth a proposal for the target Federal Funds rate on which all committee members cast their vote. Rather than casting a simple yea or nay vote indicating support or opposition for the proposal, committee members who wish to cast dissenting votes instead state their alternative preferred interest rate. This voting process and reporting procedure has afforded scholars valuable insight into the preferences of dissenting members and made possible the estimation of "individual reaction functions," as popularized by Chappell, Havrilesky and McGregor (1993), to approximate individual differences in monetary policy preferences. Early research employing such models and voting data focused primarily on scaling the ideology of individual central bankers on a single dimension of monetary policy conservatism. For example, Chappell and McGregor (2000) and Chang (2003) use voting data and a variety of macroeconomic indicators including inflation, unemployment, money growth, and the like to scale members of the FOMC according to how hawk-ish and dove-ish they are with respect to fighting inflation. In these models, each individual-level fixed effect is treated as a "time independent estimate of the true ideal federal funds rate for individual" central bankers (Chang 2003).

While much of this literature focuses on meeting-level macroeconomic variables and leaves remaining individual differences as unexplained proxies for monetary policy preferences, scholars have also identified a variety of individual-level predictors of monetary policy voting behavior to explain such variation. Some of the first efforts to examine variation in monetary policy preferences highlighted differences between the voting behavior of governors and

presidents serving on the FOMC. In short, scholars observed that presidents appeared to be more inflation averse than governors (Havrilesky and Gildea 1991; Chappell, Havrilesky and McGregor 1993, 1995). However, Tootell (1996) challenges the inference that this observed difference has to do with individuals' position as a president or governor. Once he accounts for the partisan affiliation of the appointing president for governors and confirming BoG chairperson for presidents, Tootell (1996) shows there are no remaining differences in the voting behavior of presidents and governors. Individuals' partisan affiliations have proven a robust predictor of monetary policy voting behavior across a variety of model specifications, measures, and empirical approaches.

A second predictor of monetary policy voting behavior which has amassed considerable empirical support is central bankers' career backgrounds (Havrilesky and Gildea 1991; Chappell, Havrilesky and McGregor 1995; Adolph 2013). That is, even after accounting for the partisan affiliation of those who appoint and confirm individuals to the FOMC, central bankers' careers prior to joining the Fed appear to shape their votes on monetary policy. Specifically, individuals with career backgrounds in the financial sector (i.e., private banking) are expected to cast dissenting votes for tightness rather than ease, while the opposite is true for those with experience in government. In the most recent and holistic treatment of this hypothesis, Adolph (2013) develops an index of central bank career conservatism to reflect the expected hawkish-ness of central bankers attributed to their career experiences prior to joining a monetary policy committee. With this measure, he presents robust empirical evidence for the voting behavior of monetary policymakers at the Fed as well as a sample of 19 additional central banks from 1950 to 2000.

While much has been learned about central bank preferences from the examination of FOMC voting records, the infrequency of dissents poses considerable challenges for scholars wishing to meaningfully differentiate the preferences of individual committee members. As is clear from Figure 1 which plots the number of dissents by meeting, there is a strong norm of consensus during the final vote. The modal number of dissents at a rate-setting meeting is zero and the 248 dissenting votes cast between 1969 and 2019 results in an average of 4.9 dissents
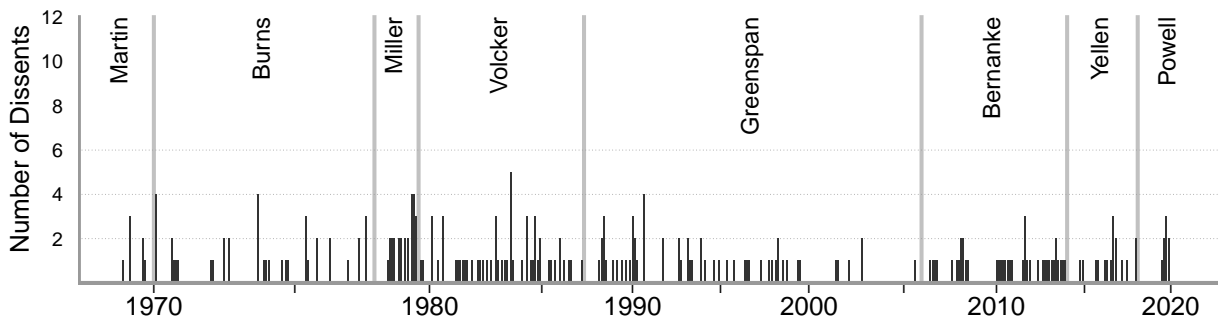
Figure 1: Frequency of Dissenting Votes on FOMC (1969-2019)

per calendar year. Critically, however, the final vote is a small snapshot of the policymaking process as well as the observable data from the FOMC's rate-setting meetings. Prior to the chair's proposal of a rate on which the committee takes their final vote, the FOMC engages in a lengthy deliberative process during which FOMC members as well non-voting (alternate) Presidents and staff economists discuss and debate the state of the economy and directions moving forward. In the most important part of the meetings for the purposes at hand, committee members engage in what is known as a policy "go-round," during which each member of the FOMC shares their preferred policy position. Unlike monetary policy committees elsewhere that reduce reports from rate-setting meetings to recording the final vote and in some cases a summary of debate, the FOMC publishes verbatim transcripts from their rate-setting meetings with a five-year delay.

Recent advances in the analysis of textual data have lead to a growing line of research that draws on these transcripts to ask similar questions about the nature of monetary policy preferences and conduct of monetary policy. As noted by Meade (2005) and Lähner (2018), individuals final votes are often appear "inconsistent" with their stated preferences during committee deliberations. Thus, focusing on voting records alone likely obfuscates underlying differences in central bank preferences and monetary policymaking strategies. However, while transcripts contain information that is masked in voting records, scholars adopting machine learning techniques to analyze the textual data have identified many of the same determinants of individual behavior recognized in the literature on FOMC voting
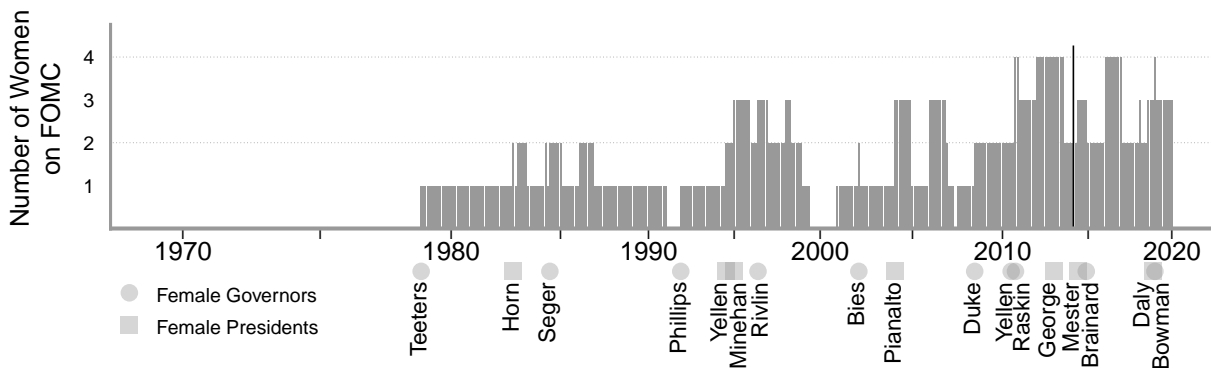
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Figure 2: Gender Diversity on the FOMC (1969-2019)

behavior. For example, Hansen, McMahon and Prat (2018) employ an LDA topic model and demonstrate the presence of career considerations in transcripts. Baerg and Lowe (2020) adopt a similar topic modeling approach and estimate individual central bank preferences as a ratio of each members' discussion devoted to issues of price stability compared to output and unemployment. With these novel measures of central bank preferences derived from the transcripts, the authors demonstrate existing estimates from voting records understate the variability of central bank conservatism at the FOMC.

Incorporating Gender in Monetary Policymaking. Despite this extensive literature on the determinants of central bankers' voting behavior and preferences, gender has until recently received relatively little attention. To the extent gender has been included in much of this empirical work, its role in the conduct of monetary policy has been treated largely as a conjecture based on admittedly small samples with limited theoretical development. Figure 2 depicts the historical lack of gender diversity on the FOMC. Even after Nancy Teeters broke the gender barrier after being appointed by President Carter in 1978, the modal number of women serving on the FOMC per meeting in a given year remained one (of 12) for several decades. It was only in the late 2000s that a sufficient number of women were appointed to the BoG that there were at least two women casting votes in every meeting. That said, this of course remains small minority of seats on the FOMC, no where near approaching the six necessary for equitable gender representation.

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Despite unavoidable inferential challenges due to the long-standing lack of gender diversity at the FOMC, Chappell and McGregor (2000) — henceforth referred to as CM (2000) — provide the first evidence of a gender effect in the conduct of monetary policy in their study of thirty years of FOMC voting records from 1966 to 1996. After estimating individiual reaction functions and ranking all voting members of the FOMC during this period according to how "ease-oriented" they are, the authors note that six of the seven women in the sample are "among the thirteen most ease-oriented members" (Chappell and McGregor 2000, 920). While the authors note the small number of women having served on the FOMC necessarily means their conclusions are speculative, they go on to suggest that "greater representation of women in the Fed's monetary policy decision process could have an important effect on policy outcomes" (Chappell and McGregor 2000, 920). While CM (2000) do not explicitly offer a theoretical explanation for why women would be more dove-ish than their male colleagues, the finding is consistent with a theory of substantive representation. If women and minorities in the United States disproportionately bear the costs of disinflation as has been demonstrated by Braunstein and Heintz (2008) and Seguino and Heintz (2012), it would make sense that those women serving on the FOMC might represent their interests as women and vote in such a way that makes them appear more inflation tolerant than their male colleagues. Further, while one might argue the interests of female members of the FOMC with respect to monetary policy are not aligned with women more generally, such behavior would still be consistent with the broader literature on gender and decision-making that suggests women are more likely to act in the interest of minority groups.

However, a growing empirical literature on gender and central banking has emerged since CM (2000) suggesting the opposite relationship may be true — that female central bankers are typically more inflation averse than their male colleagues. Much of this research builds on the work of Farvaque, Hammadou and Stanek (2010), which examines the relationship between the share of seats held by women on monetary policy committees and inflation outcomes. Drawing on an an analysis of inflation performance in nine OECD countries from 1999 to 2008, the authors conclude that conditional on operating under an explicit inflation target, women

on monetary policy committees are likely more hawk-ish than men.[3] Notably, this finding that increased female representation on central bank boards appears to be associated with lower levels of inflation has since been replicated elsewhere. Farvaque, Stanek and Vigeant (2014) recover evidence of this relationship for the same sample of nine OECD countries from 1999 to 2010, while Diouf and Pépin (2017) show for a diverse sample of developing and emerging market economies that central banks with female chairs conduct monetary policy in a way that suggests they care only about price stability.[4]

While the proposed relationship between inflation performance and the gender composition of monetary policy committees may reflect gendered differences in monetary policymaking strategies, it does not explicitly examine differences in the conduct of monetary policy by gender. That is, none of these aforementioned papers observe the behavior of individual central bankers, but rather examine the relationship between inflation performance and the diversity of monetary policy committees. There are a variety of intervening factors that could drive the relationship observed in these papers even if women do not vote systematically different than their male colleagues. For example, the presence of women on monetary policy committees could affect the decision-making of male colleagues, a pattern widely recognized in the context of judicial decision-making (Boyd, Epstein and Martin 2010). Further, if markets perceive female policymakers differently than they do male policymakers just as voters have been found to view female candidates as more focused on social welfare (Dolan 2004), this could affect inflation performance even if male and female policymakers do not conduct policy differently. Finally, this research does not account for the selection process by which women are appointed to central banks, meaning we cannot determine whether these different inflation outcomes are due to the observed variation in gender diversity or the conditions that lead to

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[3]Because the result is conditional on there being an inflation target, it applies only to the subset of the sample with explicit targets — Australia, Canada, New Zealand, Sweden, and the United Kingdom — and not those central banks they code as not operating with an explicit target, including the ECB, Bank of Japan, Swiss National Bank, and Fed.

[4]Diouf and Pépin (2017) examine this relationship in Argentina, Belarus, Guatemala, Guyana, Kyrgyzstan, Paraguay, Salvador, and Turkmenistan.

gender diversity, or lack thereof, in the first place (Masciandaro, Profeta and Romelli 2015). As Farvaque, Hammadou and Stanek (2010, 234-235) concede, since the samples considered in these articles are "larger and more recent, this result is perhaps not surprising, and may reflect a general trend toward more 'conservative' central banks."

Bennani, Farvaque and Stanek (2018) — henceforth referred to as BFS (2018) — address some of these issues in a study of individual-level monetary policy decisions at the FOMC rather than aggregate inflation performance. Drawing on the stated positions of FOMC members at rate-setting meetings from 1994 to 2008, the authors' examine variation in the policy preferences of central bankers across a variety of individual-level predictors including their career backgrounds and the party of the appointing president. In doing so, they present evidence that directly contradicts the result from CM (2000): female policymakers during this period appear more hawk-ish than their male colleagues. This suggests the findings in the aforementioned literature on the relationship between gender diversity and inflation performance may in fact stem from women taking different monetary policymaking strategies. BFS (2018) argue women are likely to be more inflation averse than their male colleagues not because perceive price stability as in their own interest necessarily, but because demonstrating a commitment to price stability affords women the strong reputation and credibility necessary to succeed at the central bank (Masciandaro, Profeta and Romelli 2015).

Revisiting Evidence of Gender Differences in FOMC Voting. How should we reconcile the disparate findings concerning the effect of gender on monetary policy? That is, do women conduct monetary policy differently than their male colleagues and, if so, are they more hawk-ish – as suggested by BFS (2018) – or dove-ish – as suggested by CM (2000)? I argue here that these conflicting accounts stem not from temporal changes in the practice of central banking as has been suggested, but rather unaccounted for covariate imbalance in predictors known to affect monetary policy including the party of the appointing president and central bankers' career backgrounds prior to joining the MPC. I consider each of these and their consequences for estimating gender differences in monetary policy voting records in turn.

The number of female committee members in each sample is relatively small and, particularly in BFS (2018), appointed in close proximity to one another often by presidents of the same political party. While only overlapping two years, each sample contains seven women including four members of the BoG and three regional bank presidents. In the thirty years of voting records examined in CM (2000), the seven female policymakers include two governors appointed by Democratic presidents, two governors appointed by Republican presidents, and an additional three Reserve Bank presidents. Thus, despite the fairly small number of "female" observations for such a long sample period, the covariate balance on the party of appointing president makes reasonably possible the distinction between any effect of gender and the effect of partisan appointment strategies widely recognized in the extant literature. Unfortunately, the same is not true for the shorter time period under examination in BFS (2018). To leverage the more detailed data on policymakers' preferences contained in FOMC transcripts, BFS (2018) focus their analyses on observations occurring between 1994 and 2008. While doing so has the advantage of overcoming some of the issues associated with insincere voting, it generates a sample with substantial covariate imbalance with respect to the party of the appointing president. Only one female member of the FOMC in the BFS (2018) sample, Alice Rivlin, was appointed by a Democratic president. Governor Rivlin accounts for just 12% of all "female" observations in the authors' sample, meaning the vast majority of the "female" observations during this period are for Republican appointed governors and Reserve Bank Presidents. Given the conventional wisdom that both Republican appointees and Reserve Bank Presidents are typically more more hawk-ish for reasons unrelated to gender, it is perhaps unsurprising the evidence presented in BFS (2018) suggests women appear more inflation averse than their male colleagues. Without addressing the covariate imbalance with respect to partisan appointments during the time period examined by BFS (2018), estimates of the effect of being female are likely to exhibit a positive bias.

While the earlier sample drawn on in CM (2000) exhibits reasonable balance across Presidents and Governors as well as the party of the appointing president, it is comparatively imbalanced with respect to the career backgrounds of male and female policymakers when
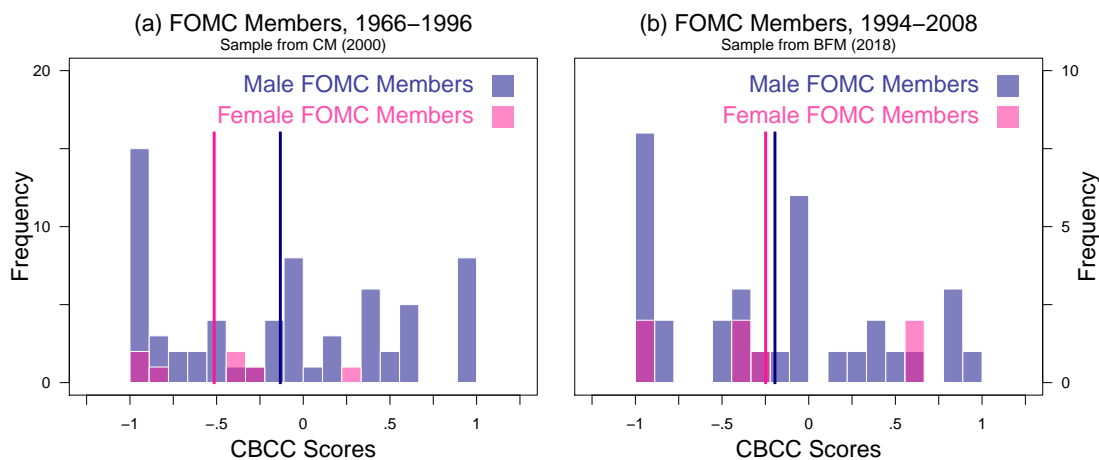
Figure 3: Central bank career conservatism scores by gender for the samples in (a) Chappell and McGregor (2000) on rate-setting meetings from 1966 to 1996 and (b) Bennani, Farvaque and Stanek (2018) from 1994 to 2008.

they join the FOMC. Previous research shows that individuals' with prior career experience in central banking or the broader government bureaucracy (excluding finance ministries) typically pursue more dove-ish monetary policy positions, while those with previous careers in either private banking or finance ministries are typically more hawk-ish in their approach to monetary policy. This observation underlies the central bank career conservatism (CBCC) index developed by Adolph (2013), which captures the "conservatism" of individual central bankers' career backgrounds ranging from least (-1) to most (1) conservative. Figure 3 plots the distribution of CBCC scores for FOMC members included in the CM (2000) and BFS (2018) samples, respectively. Between 1966 and 1996, female members of the FOMC were on average much more likely to join after having worked in other positions within the Federal Reserve System or in the federal government. This is reflected in the average CBCC score for women being significantly to the left of that for men. In this case, leaving this covariate imbalanced unaddressed stands to introduce a negative bias in the estimated effect of gender on monetary policy. As such, it is possible the result from CM (2000) that suggests women appear more dove-ish in their approach to monetary policy is attributable not to the fact that those policymakers are women, but because they came disproportionately from individuals with less conservative career backgrounds.

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Research Design

To re-visit the findings in the extant literature and examine whether the identified covariate imbalance occurring during early and short samples stands to bias our estimated effect of gender, I draw on a dataset with nearly six decades of rate-setting meetings held by the FOMC from 1970 to 2019. In addition to providing the first estimates for the effect of gender on this complete sample voting records, I re-estimate each model on observations from 1970 to 1996, replicating the findings of CM (2000), as well as the more recent period beginning in 1994 similar to the empirical analysis conducted in BFS (2018). In doing so, I employ matching procedures to examine the degree to which the conflicting accounts on the effect of gender on monetary policy voting behavior is attributable to differences between the career backgrounds and appointing presidents of male and female committee members included in each sample. After demonstrating this is in fact the case and finding no evidence of gender differences in FOMC voting behavior in the complete sample, I turn to an analysis of FOMC transcripts and show that the preoccupation with voting records obfuscates important consequences of gender diversity on monetary policy committees. Drawing on the advances in the measurement of central bank preferences from transcript rather than voting data as developed by Baerg and Lowe (2020), I show female committee members appear to speak disproportionately about topics related to economic output and employment rather than price stability and inflation.

Gender and Voting Behavior on the FOMC. To construct a dependent variable corresponding to each members vote, I follow much of the extant literature and reduce individual statements of preferred interest rates to an ordinal indicator $v_{it} = j$ reflecting whether individual i at meeting t votes to lower ($v_{it} = 1$), maintain ($v_{it} = 2$), or raise ($v_{it} = 3$) the target Federal Funds rate. While nearly every meeting in the sample includes the more detailed information recording the specific rate for which each central banker voted, there are early periods in which only the direction of dissents is reported. Thus, coding the voting variable this way allows for consistency across the entire sample and does not require additional

	CBCC	DemAppt	Inflation	Sample Size	Matched: M;F
1970 − 2019	98.27%		97.67%	2199	1641; 558
1970 − 1996	94.17%	100%	90.69%	713	573; 140
1994 − 2019	99.15%	100%		1256	880; 376

Table 1: Percent Balance Improvement with CEM

assumptions about the randomness of those observations that only include directional votes. Additionally, given the length of the time series, a given target rate does not imply the same policy strategy at two points in time. The stance individuals and the committee take with respect to tightening or loosening monetary policy is more informative of the monetary policy strategy than the precise rate selected or the magnitude of the rate change.

Female members of the FOMC account for just 597 (13%) of the 5040 votes cast by members of the FOMC since 1970. Before turning to an estimation of the differences in voting behavior between male and female committee members, I implement matching methods to address any imbalance across the three samples on covariates the existing literature recognizes as predictive of monetary policy decision-making. Specifically, I include covariates indicating individuals' gender (Female$_i \in \{0, 1\}$) and career conservatism score (CBCC$_i \in [0, 1]$) as well whether they are a member of the Board of Governors (BoG$_i \in \{0, 1\}$) and whether they joined the FOMC via appointment from a Democratic president (DemAppt $\in \{0, 1\}$). In addition to these individual-level covariates, I include as covariates and assess balance of three macroeconomic indicators widely recognized to affect rate-setting behavior of central bankers: Inflation$_t$, Unemployment$_t$, and FedFundsRate$_{t-1}$. With this set of potentially confounding covariates, I follow the advice and procedures outlined in King and Nielsen (2019) and prune the respective samples with coarsened exact matching (CEM).[5] While I reserve the complete results from matching for the online appendix, Table 1 provides the percent balance improvement from matching in each of the three samples as well as the resulting sample sizes for each time period.

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[5]King and Nielsen (2019) note CEM is best suited for matching when working with discrete covariates.

	1970–1996		1994–2019		1970–2019	
Female	−.520**	−.527	.230*	.212	−.012	−.001
	(.148)	(.272)	(.113)	(.140)	(.090)	(.107)
Dem. Appointment	−.091	−.415	−.149	−.305	−.032	−.007
	(.098)	(.443)	(.130)	(.188)	(.076)	(.145)
CBCC	−.042	.339	.053	−.140	−.005	−.040
	(.051)	(.636)	(.073)	(.113)	(.042)	(.089)
Board of Governors	−.057	.528	−.269*	−.010	−.152*	−.116
	(.075)	(.400)	(.113)	(.172)	(.063)	(.130)
Inflation	.208**	.202**	.265**	.341**	.185**	.216**
	(.023)	(.057)	(.046)	(.065)	(.018)	(.030)
Unemployment	−.574**	−.566**	−.133*	−.061	−.367**	−.367**
	(.045)	(.092)	(.056)	(.078)	(.028)	(.042)
Fed Funds Rate$_{t-1}$	−.163**	−.168**	−.211**	−.179**	−.194**	−.212**
	(.022)	(.049)	(.037)	(.050)	(.017)	(.026)
Matching?	–	CEM	–	CEM	–	CEM
AIC	6184.5	1458.9	3835.7	2167.7	9725.2	4378.5
Num. obs.	3077	713	2231	1256	5040	2199

$^{**}p < 0.01, {}^{*}p < 0.05$

Table 2: Estimates of Gender on Monetary Policy Votes

Estimates from ordered probit regression models on FOMC voting records specified in Equation 1. Standard errors are provided in parentheses and coefficients in which $p < .01$ ($p < .05$) are denoted with a two (one) asterisks. The bottom row of the table indicates whether each model is estimated on the full or matched sample, as constructed via coarsened exact matching (CEM).

For each sample period using both the full and matched data, I estimate the following ordinal probit model where the probability that committee member i casts a vote j at rate-setting meeting t is given by:

$$\Pr\left(v_{it} = j | \mathbf{x}_{it}\right) \;\; = \;\; \int_{\tau_{j-1}}^{\tau_j} \mathrm{N}\left(\mathbf{x}_{it}\beta, 1\right) \mathrm{d}\mathbf{x}_{it}\beta \tag{1}$$

where $\mathbf{x}$ is a vector of the individual- and meeting-level covariates described above as well as fixed effects for the Chairperson at meeting t, β is a vector of estimated coefficients, and τ is a $j + 1$ vector of cutpoints. The estimates of this model for the three different samples on both full and matched datasets are given in Table 2.

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Several findings are worth highlighting. First, in the models estimated on the unmatched samples from 1970-1996 and 1994-2019 – in the first and third columns, respectively – I recover the opposite effects of being female on monetary policy hawkishness cited in the extant literature. For the earlier time period that includes the female observations from CM (2000), estimates from the unmatched sample suggest women are 12% more likely to vote to lower the rate (95% CI: 5.1%-18.5%). When this same model is estimated on the later time period, women appear more conservative than their male colleagues as is reported in the BFS (2018) analysis. In the unmatched sample for 1994 to 2019, women serving on the FOMC are 2% less likely to vote to lower the rate. Finally, in the unmatched sample for the entire time series from 1970 to 2019 (column 5), there is no statistically significant difference between the voting behavior of male and female policymakers.

When these models are re-estimated on matched samples to address the covariate imbalance discussed above, the significance of gender for monetary policy voting behavior disappears across all periods. In neither of the truncated samples similar to those employed in the extant research do the results hold when the samples are pruned to correct for imbalance on the career backgrounds and party of the appointing president. These results are presented in columns 2 and 4, where the negative and positive coefficients on gender no longer achieve statistically significant levels of confidence. Finally, in the matched sample for the entire period, there is no significant effect of being female on the voting behavior of FOMC members. The only coefficients that are consistently significant across sample periods and specifications are the meeting-level macroeconomic indicators. As one would expect, committee members are more likely to vote in favor of contractionary monetary policy when inflation increases, and more likely to vote for expansionary monetary policies as unemployment and the lagged Federal Funds Rate increase.

While the absence of statistically significant effects for individual-level covariates is distinct from some of the extant literature on FOMC voting records, it is not terribly surprising given the infrequency of dissenting votes at the FOMC depicted in Figure 1. This finding, however, should not be interpreted as evidence that there are no individual differences in

monetary policy preferences or, more specifically, that gender diversity ought to be of no consequences since male and female committee members do not appear to vote differently from one another. Rather, this highlights the well-documented limitations of using central bank voting records to draw inferences about the process of monetary policymaking. In the remainder of the article, I move away from this preoccupation with final votes and examine the degree to which the gender composition of the committee stands to shape the content of FOMC deliberations.

Gender and Policymaking Discourse on the FOMC. To overcome the limitations with FOMC voting records and examine the potential consequences of gender diversity for the content of pre-vote deliberations, I draw on the transcripts from the FOMC's rate-setting meetings to construct a measure of the relative attention each individual central banker devotes to issues of price stability compared to output and employment. In constructing this measure, I borrow heavily from the approach developed and validated by Baerg and Lowe (2020). Drawing on a sample of FOMC transcripts from 24 rate-setting meetings between 2005 and 2008, Baerg and Lowe (2020) construct measures of the relative emphasis individuals place on price stability and inflation. This novel approach to conceptualizing and measuring individual-level preferences not only overcomes issues with discerning preferences from largely uninformative voting records, but provides a theoretical foundation for understanding monetary policy preferences in the context of a Taylor rule trade-off between price stability and output.

To scale central bankers according to how much they emphasize issues of price stability compared to output, Baerg and Lowe (2020) employ an n-gram topic model. An n-gram topic model is similar in theory to the more conventional LDA topic models which have been used previously in the analysis of FOMC transcripts – i.e., Hansen, McMahon and Prat (2018). Both models employ machine learning techniques to estimate a predetermined number of topics from a corpus of text, where each returned "topic" has a corresponding list of words (tokens) found to be closely associated with one another in the corpus of speech. The advantage of n-gram models, however, is the added ability to recognize multi-word phrases

such as "price stability" and "inflation expectations" as single elements of a topic rather than dividing each into two separate tokens. The output of these models is a predetermined number of unlabelled topics, leaving it up to the analyst to infer from the top tokens and phrases in each topic what that topic substantively represents. With their preferred $K = 25$ topic model, Baerg and Lowe (2020) identify four distinct topics which cover different aspects relating to output, unemployment, and price stability. Having identified the top words and phrases associated with each topic, the authors generate counts of how frequently these words and phrases are contained in individual committee members' speeches during rate-setting meetings. To code the extended sample at hand, I use the same topic classification and top tokens as described in Baerg and Lowe (2020).

In the analysis that follows, I draw on transcripts from rate-setting meetings of the FOMC occurring between 1979 and 2014. This time period spans the complete terms of Paul Volcker (1979-1987), Alan Greenspan (1987-2006), and Ben Bernanke (2006-2014) as chairmen of the FOMC. In total, this results in 5353 individual-meeting observations drawn from 289 rate-setting meetings. For each speaker i in meeting t, I construct count variables corresponding to the frequency with which they use words and phrases Baerg and Lowe (2020) identify as relating to price stability (q_{it}^p) and economic output/employment (q_{it}^e). The dependent variable in the analyses that follow – the relative concentration of each members' speech devoted to price stability (Q_{it}^p) – is given by the following ratio:

$$Q_{it}^p \quad = \quad \frac{q_{it}^p}{q_{it}^p + q_{it}^e}. \tag{2}$$

The distribution of Q_{it}^p is depicted in the left panel of Figure 4. When an individual has a higher (lower) value of Q_{it}^p for a given meeting, this means a larger (smaller) proportion of their speech in this meeting was devoted to price stability compared to output and unemployment. The substantial left skew reflects the central role of considerations of price stability and inflation play in the conduct of monetary policy, a pattern which similarly emerged in the shorter time period examined by Baerg and Lowe (2020). However, there exists meaningful
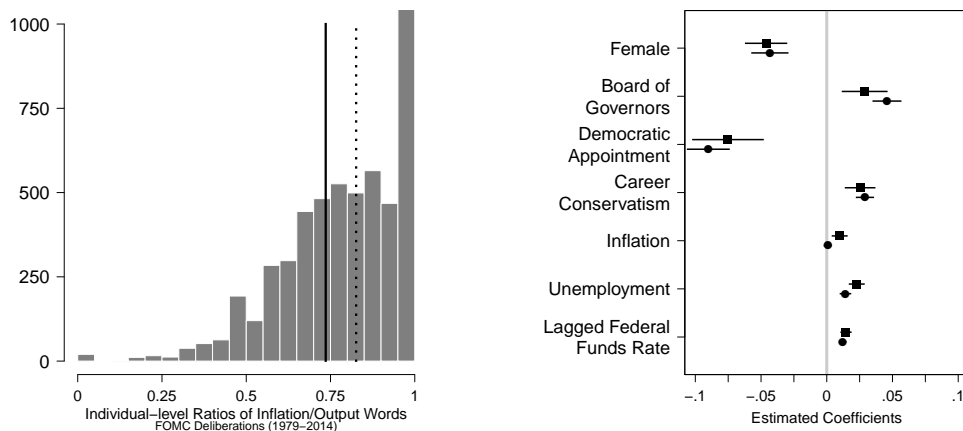
Figure 4: Results from Analysis of FOMC Transcripts (1979-2014)

variation in the sample both across meetings and individual committee members. Further, the solid and dashed reference lines reflect the median value for female and male committee members, respectively, and seem descriptively consistent with the expectation that female members of the FOMC may emphasize price stability less than their male colleagues.

With this ratio as the dependent variable, I estimate a series of linear regression models incorporating the effect of gender and other individual- and meeting-level variables discussed in the previous sections. The estimated coefficients and their corresponding 95% confidence intervals are presented in the right panel of Figure 4, which includes estimates for both full (square) and matched (circle) samples.[6] In contrast to the analysis of voting records where limited variation on the dependent variable resulted in differences across full and matched samples, the results when examining individual variation in the topics of deliberations are substantively identical across full and matched samples.

Most notably, gender appears to have a sizable and statistically significant effect on the substantive content of committee members' deliberations. On average, female members of the FOMC devote 4.6% less of their inflation- and output-related speech to issues classified as relating to price stability. While small in absolute terms, it is worth pointing out that this is as large of an effect for gender as we see for other individual-level covariates more often recognized as affecting individuals' monetary policy preferences. Consistent with theoretical

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[6]See online appendix for complete results and description of matching procedure.

expectations, the models consistently demonstrate that individuals with career backgrounds in the finance industry disproportionately emphasize issues of price stability during deliberation. Members of the Board of Governors are similarly more likely to focus on price stability compared to output and employment. By contrast, individuals appointed by democratic presidents devote a greater share of their pre-vote discussion to issues surrounding output and employment. Each of these individual-level results are consistent with extant theory on the heterogeneity of central bankers preferences despite the fact that empirical evidence of these relationships has been obfuscated by strong norms of consensus in the voting records.

Discussion

Taken together, the empirical evidence presented here reaffirms the general consensus that "diversity matters" for collective decision-making. Even where it is difficult as outside observers to discern any individual differences in behavior, the case of decision-making at the FOMC seems to suggest the consequences of gender diversity are more complex and widely felt than voting records alone might convey. The analyses here make two contributions to the literature on gender and monetary policy. First, with a close examination of the differences in partisan and career backgrounds between male and female FOMC members that highlights temporal differences in these samples, the results here provide a theoretically grounded explanation for the mixed results in the extant literature concerning the consequences of gender for voting on monetary policy committees. After addressing the identified issues of covariate imbalance between male and female members of the FOMC, there is little evidence to suggest female committee members vote differently than their male colleagues.

However, this is not to say gender is of no consequences for the conduct of monetary policy. The second empirical contribution of this paper is demonstrating the effects of gender on the content of FOMC deliberations. Female members of the FOMC appear to focus a greater share of their contributions to the pre-vote deliberations on issues surrounding output and unemployment rather than price stability. This result holds for a sample of over thirty years, controlling for individual differences in career background, role on the committee, and

party of the appointing president. Thus, despite the absence of gendered difference in the conduct of monetary policy at the time of a vote, a more gender balanced monetary policy committee is likely to consider and debate different economic issues and consequences than an all male committee. This finding provides one viable explanation for the observed differences in inflation performance of central banks led by male and female chairpersons.

Taken together, these findings have important implications for ongoing debates over the design of legislation to promote the diversification of monetary policy committees. Advocates of gender diversity at central banks often present it as a mechanism for achieving substantive representation. The argument goes that since women and racial minorities bear a disproportionate share of the costs associated with contractionary monetary policies (Seguino and Heintz 2012), they ought to have a voice at the table in these decisions. The finding that female members of the FOMC appear to emphasize issues of employment and output more than their male colleagues suggests more descriptively diverse committees may in fact provide a more balanced representation of these interests. However, it is important to recognize the differences are fairly marginal when one considers historically the small number of women holding seats on the FOMC at any given meeting. As the scope of central bank authority increasingly expands into areas such as regulatory policy with greater potential for redistribution, these issues are likely to become even more central than they already are.

Beyond the domain of monetary policy, the theoretical and empirical results in this article lay a foundation for future research on the consequences of gender diversity more broadly. While the FOMC provides a rich empirical environment to explore these theoretical expectations, there is nothing particularly unique about this policy domain that would limit these results from applying to collective decision-making more broadly. For example, we can imagine the mechanisms observed here similarly operating on most private and public boards that require substantial academic credentials and expertise. Further, on those committees were we cannot observe transcripts or potentially those with more informal "voting" procedures to make collective decisions, the empirical patterns we observe here suggest diversity should still be of consequences for decision-making. Although the casting of final votes is a critical

channel for influence, our understanding of gender diversity and its consequences for collective decision-making should more broadly speak to the process by which minorities engage and affect the decision-making process.

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Supplementary Online Appendix
"The Consequences of Gender Diversity at the Federal Reserve"

A Analysis of FOMC Voting Records

A.1 Regression Robustness Checks, Full Samples

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female			.022	−.050	.025	−.038	.049	−.012
			(.085)	(.087)	(.086)	(.089)	(.087)	(.090)
Dem Appt.					−.050	−.111	.036	−.032
					(.067)	(.069)	(.074)	(.076)
CBCC					−.021	−.030	.006	−.005
					(.040)	(.041)	(.041)	(.042)
Board of Gov.							−.170*	−.152*
							(.063)	(.063)
Inflation	.087*	.184*	.087*	.184*	.088*	.184*	.089*	.185*
	(.015)	(.018)	(.015)	(.018)	(.015)	(.018)	(.015)	(.018)
Unemployment	−.141*	−.366*	−.142*	−.365*	−.142*	−.367*	−.141*	−.367*
	(.019)	(.028)	(.019)	(.028)	(.019)	(.028)	(.019)	(.028)
Fed Funds Rate$_{t-1}$	−.049*	−.193*	−.049*	−.193*	−.050*	−.193*	−.049*	−.194*
	(.011)	(.017)	(.011)	(.017)	(.011)	(.017)	(.011)	(.017)
1|2	−2.153*	−3.703*	−2.151*	−3.708*	−2.164*	−3.735*	−2.222*	−3.799*
	(.125)	(.189)	(.125)	(.189)	(.126)	(.190)	(.128)	(.192)
2|3	.423*	−1.050*	.426*	−1.054*	.413*	−1.080*	.358*	−1.142*
	(.120)	(.180)	(.120)	(.180)	(.122)	(.181)	(.124)	(.183)
Chair FE?	No	Yes	No	Yes	No	Yes	No	Yes
AIC	9899.372	9726.315	9901.307	9727.992	9904.524	9728.961	9899.122	9725.227
Num. obs.	5040	5040	5040	5040	5040	5040	5040	5040

Table 1: FOMC Voting Records (1970 - 2019), Unmatched Sample

Results from ordered probit regression models on the complete sample of voting records from 1970 to 2019. Dependent variable is a three-category indicator for individual i's vote at meeting t to lower ($v_{it} = 1$), maintain ($v_{it} = 2$), or raise ($v_{it} = 3$) rates. Each model is estimated with and without fixed effects for the chair of the board. Asterisks indicate *$p < 0.05$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female			−.435*	−.538*	−.442*	−.533*	−.429*	−.520*
			(.141)	(.145)	(.142)	(.147)	(.143)	(.148)
Dem Appt.					−.041	−.114	−.015	−.091
					(.090)	(.093)	(.095)	(.098)
CBCC					−.039	−.048	−.032	−.042
					(.050)	(.050)	(.050)	(.051)
Board of Gov.							−.062	−.057
							(.074)	(.075)
Inflation	.062*	.210*	.055*	.209*	.055*	.208*	.056*	.208*
	(.016)	(.023)	(.016)	(.023)	(.016)	(.023)	(.016)	(.023)
Unemployment	−.214*	−.568*	−.209*	−.572*	−.209*	−.575*	−.209*	−.574*
	(.033)	(.045)	(.033)	(.045)	(.033)	(.045)	(.033)	(.045)
Fed Funds Rate$_{t-1}$	.023	−.165*	.028	−.164*	.028	−.163*	.027	−.163*
	(.014)	(.022)	(.015)	(.022)	(.015)	(.022)	(.015)	(.022)
1|2	−2.012*	−4.543*	−2.017*	−4.635*	−2.021*	−4.652*	−2.048*	−4.672*
	(.196)	(.302)	(.196)	(.304)	(.197)	(.304)	(.200)	(.305)
2|3	.219	−2.217*	.220	−2.301*	.217	−2.317*	.190	−2.336*
	(.192)	(.292)	(.192)	(.294)	(.193)	(.294)	(.196)	(.295)
Chair FE?	No	Yes	No	Yes	No	Yes	No	Yes
AIC	6351.220	6192.900	6343.706	6181.197	6346.994	6183.116	6348.288	6184.533
Num. obs.	3077	3077	3077	3077	3077	3077	3077	3077

Table 2: FOMC Voting Records (1970-1996), Unmatched Sample

Results from ordered probit regression models on a truncated sample of voting records from 1970 to 1996, capturing the majority of the period under examination in Chappell and McGregor (2002). Dependent variable is a three-category indicator for individual i's vote at meeting t to lower ($v_{it} = 1$), maintain ($v_{it} = 2$), or raise ($v_{it} = 3$) rates. Each model is estimated with and without fixed effects for the chair of the board. Asterisks indicate *p < 0.05.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female			.107	.148	.155	.191	.196	.230*
			(.108)	(.109)	(.111)	(.112)	(.112)	(.113)
Dem Appt.					−.287*	−.320*	−.106	−.149
					(.106)	(.108)	(.127)	(.130)
CBCC					.031	−.002	.091	.053
					(.068)	(.069)	(.072)	(.073)
Board of Gov.							−.290*	−.269*
							(.112)	(.113)
Inflation	.251*	.272*	.252*	.272*	.241*	.265*	.247*	.265*
	(.043)	(.046)	(.043)	(.046)	(.044)	(.046)	(.044)	(.046)
Unemployment	−.171*	−.115*	−.171*	−.120*	−.184*	−.126*	−.175*	−.133*
	(.032)	(.056)	(.032)	(.056)	(.033)	(.056)	(.033)	(.056)
Fed Funds Rate$_{t-1}$	−.158*	−.201*	−.156*	−.202*	−.167*	−.210*	−.159*	−.211*
	(.026)	(.037)	(.026)	(.037)	(.026)	(.037)	(.026)	(.037)
1|2	−2.755*	−2.783*	−2.729*	−2.795*	−2.923*	−2.937*	−2.948*	−3.087*
	(.251)	(.450)	(.252)	(.450)	(.263)	(.453)	(.263)	(.458)
2|3	.492*	.496	.518*	.486	.334	.355	.317	.212
	(.241)	(.445)	(.243)	(.446)	(.252)	(.448)	(.252)	(.452)
Chair FE?	No	Yes	No	Yes	No	Yes	No	Yes
AIC	3864.302	3844.132	3865.319	3844.295	3861.953	3839.310	3857.225	3835.650
Num. obs.	2231	2231	2231	2231	2231	2231	2231	2231

Table 3: FOMC Voting Records (1994 - 2019), Unmatched Sample

Results from ordered probit regression models on a truncated sample of voting records from 1994 to 2019, which contains and extends to present-day the period examined by BFS (2018). Dependent variable is a three-category indicator for individual i's vote at meeting t to lower ($v_{it} = 1$), maintain ($v_{it} = 2$), or raise ($v_{it} = 3$) rates. Each model is estimated with and without fixed effects for the chair of the board. Asterisks indicate *p < 0.05.

A.2   Covariate Balance and Matching Results

To correct for covariate imbalance in the three time periods under examination, I employ coarsened exact matching to prune the samples such that females (treatment group) are on average similar to their male colleagues (control group) on dimensions known to affect monetary policy voting behavior. To retain as much of the sample as possible, I only match on those covariates in which there exhibits meaningful differences in the full sample. For example, in the two samples with longer time periods – 1970-2019 and 1970-1996 – the treatment and control groups are not balanced with respect to inflation since there are comparatively fewer observations of female votes during the earlier time periods. However, it is not necessary to match on inflation in the more recent sample from 1994-2019, as the shorter time period results in a relatively balanced sample as is.

In tables 4-6, I show the average values of the covariates on which I match in the treatment and control groups. In addition, the last column shows the percent balance improvement on that covariate achieved with matching. The last two rows of each table provide the full and matched sample sizes across treatment and control groups.

		Treatment	Control	Improvement
CBCC	*full*	-0.35	-0.09	98.27%
	matched	-0.37	-0.37	
Inflation	*full*	3.09	4.73	97.67%
	matched	3.28	3.32	
Sample Size	*full*	597	4443	
	matched	558	1641	

Table 4: Results from CEM, FOMC Voting Data (1970 - 2019)

		Treatment	Control	Improvement
CBCC	*full*	-0.41	-0.11	94.17%
	matched	-0.66	-0.67	
Dem Appt.	*full*	0.31	0.17	100%
	matched	0.36	0.36	
Inflation	*full*	5.11	6.09	90.69%
	matched	5.10	5.19	
Sample Size	*full*	207	2870	
	matched	140	573	

Table 5: Results from CEM, FOMC Voting Data (1970 - 1996)

		Treatment	Control	Improvement
CBCC	*full*	-0.34	-0.03	99.15%
	matched	-0.34	-0.33	
Dem Appt.	*full*	0.33	0.20	97.67%
	matched	0.40	0.40	
Sample Size	*full*	447	1784	
	matched	880	376	

Table 6: Results from CEM, FOMC Voting Data (1994 - 2019)

A.3   Regression Robustness Checks, Matched Samples

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female			.007	−.052	.041	−.015	.054	−.001
			(.095)	(.100)	(.099)	(.105)	(.100)	(.107)
Dem Appt.					−.109	−.089	−.004	−.007
					(.109)	(.113)	(.142)	(.145)
CBCC					−.062	−.090	.002	−.040
					(.068)	(.069)	(.087)	(.089)
Board of Gov.							−.146	−.116
							(.127)	(.130)
Inflation	.106*	.218*	.106*	.218*	.105*	.216*	.106*	.216*
	(.024)	(.030)	(.024)	(.030)	(.025)	(.030)	(.025)	(.030)
Unemployment	−.157*	−.369*	−.158*	−.367*	−.157*	−.368*	−.154*	−.367*
	(.028)	(.042)	(.028)	(.042)	(.028)	(.042)	(.028)	(.042)
Fed Funds Rate$_{t-1}$	−.072*	−.210*	−.072*	−.210*	−.072*	−.212*	−.071*	−.212*
	(.016)	(.026)	(.016)	(.026)	(.016)	(.026)	(.016)	(.026)
1|2	−2.206*	−3.632*	−2.205*	−3.635*	−2.189*	−3.626*	−2.239*	−3.674*
	(.179)	(.274)	(.181)	(.275)	(.183)	(.275)	(.188)	(.280)
2|3	.203	−1.162*	.205	−1.165*	.222	−1.154*	.173	−1.201*
	(.172)	(.262)	(.173)	(.262)	(.175)	(.263)	(.180)	(.268)
Chair FE?	No	Yes	No	Yes	No	Yes	No	Yes
AIC	4430.975	4373.724	4432.969	4375.459	4435.334	4377.305	4436.009	4378.498
Num. obs.	2199	2199	2199	2199	2199	2199	2199	2199

$^*p < 0.05$

Table 7: FOMC Voting Records (1970-2019), Matched Sample

Results from ordered probit regression models on the matched sample of voting records from 1970 to 2019. Dependent variable is a three-category indicator for individual i's vote at meeting t to lower ($v_{it} = 1$), maintain ($v_{it} = 2$), or raise ($v_{it} = 3$) rates. Each model is estimated with and without fixed effects for the chair of the board. Asterisks indicate *p < 0.05.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female			−.205	−.212	−.411	−.532	−.399	−.527
			(.181)	(.193)	(.255)	(.272)	(.254)	(.272)
Dem Appt.					.114	.101	−.321	−.415
					(.185)	(.209)	(.431)	(.443)
CBCC					.558	.846	.132	.339
					(.494)	(.510)	(.623)	(.636)
Board of Gov.							.441	.528
							(.395)	(.400)
Inflation	.026	.196*	.023	.198*	.018	.201*	.017	.202*
	(.038)	(.057)	(.038)	(.056)	(.042)	(.057)	(.042)	(.057)
Unemployment	−.242*	−.561*	−.233*	−.555*	−.226*	−.553*	−.234*	−.566*
	(.066)	(.091)	(.066)	(.091)	(.067)	(.091)	(.067)	(.092)
Fed Funds Rate$_{t-1}$	.012	−.175*	.015	−.175*	.021	−.171*	.024	−.168*
	(.032)	(.048)	(.032)	(.048)	(.032)	(.049)	(.032)	(.049)
1|2	−2.402*	−4.624*	−2.372*	−4.635*	−2.828*	−5.376*	−2.436*	−4.938*
	(.403)	(.601)	(.404)	(.601)	(.564)	(.752)	(.663)	(.820)
2|3	−.193	−2.340*	−.160	−2.348*	−.613	−3.082*	−.218	−2.640*
	(.391)	(.580)	(.392)	(.580)	(.553)	(.732)	(.656)	(.804)
Chair FE?	No	Yes	No	Yes	No	Yes	No	Yes
AIC	1481.887	1456.611	1482.598	1457.407	1485.155	1458.587	1485.911	1458.854
Num. obs.	713	713	713	713	713	713	713	713

$^*p < 0.05$

Table 8: FOMC Voting Records (1970-1996), Matched Sample

Results from ordered probit regression models on the matched sample of voting records from 1970 to 1996. Dependent variable is a three-category indicator for individual i's vote at meeting t to lower ($v_{it} = 1$), maintain ($v_{it} = 2$), or raise ($v_{it} = 3$) rates. Each model is estimated with and without fixed effects for the chair of the board. Asterisks indicate *p < 0.05.

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female			.037	.118	.101	.211	.105	.212
			(.131)	(.135)	(.136)	(.140)	(.136)	(.140)
Dem Appt.					−.265	−.312*	−.221	−.305
					(.146)	(.150)	(.182)	(.188)
CBCC					−.054	−.143	−.030	−.140
					(.091)	(.095)	(.109)	(.113)
Board of Gov.							−.069	−.010
							(.170)	(.172)
Inflation	.308*	.344*	.308*	.342*	.300*	.342*	.300*	.341*
	(.061)	(.065)	(.061)	(.065)	(.062)	(.065)	(.062)	(.065)
Unemployment	−.165*	−.083	−.164*	−.081	−.165*	−.061	−.164*	−.061
	(.043)	(.077)	(.044)	(.077)	(.044)	(.078)	(.044)	(.078)
Fed Funds Rate$_{t-1}$	−.160*	−.186*	−.157*	−.181*	−.163*	−.179*	−.163*	−.179*
	(.035)	(.050)	(.036)	(.050)	(.038)	(.050)	(.038)	(.050)
1|2	−2.612*	−2.356*	−2.590*	−2.316*	−2.659*	−2.217*	−2.684*	−2.224*
	(.332)	(.602)	(.342)	(.604)	(.359)	(.612)	(.364)	(.625)
2|3	.643*	.930	.666*	.972	.604	1.086	.580	1.078
	(.321)	(.598)	(.331)	(.600)	(.348)	(.609)	(.353)	(.622)
Chair FE?	No	Yes	No	Yes	No	Yes	No	Yes
AIC	2175.570	2167.257	2177.492	2168.493	2177.789	2165.685	2179.627	2167.682
Num. obs.	1256	1256	1256	1256	1256	1256	1256	1256

$^*p < 0.05$

Table 9: FOMC Voting Records (1994 - 2019), Matched Sample

Results from ordered probit regression models on the matched sample of voting records from 1994 to 2019. Dependent variable is a three-category indicator for individual i's vote at meeting t to lower ($v_{it} = 1$), maintain ($v_{it} = 2$), or raise ($v_{it} = 3$) rates. Each model is estimated with and without fixed effects for the chair of the board. Asterisks indicate *p < 0.05.

B   Analysis of FOMC Transcripts

B.1   Measurement

Output and Employment: *output, employment, unemployment, labor, productivity, compensation, energy, measured, hour, market psychology, large trucks, filter estimate, price elasticity,* and *weekend strains.*

Price Stability: *price stability, inflation, percent, year, time, don, basis points, core inflation, monetary policy, inflation expectations,* and *energy prices.*
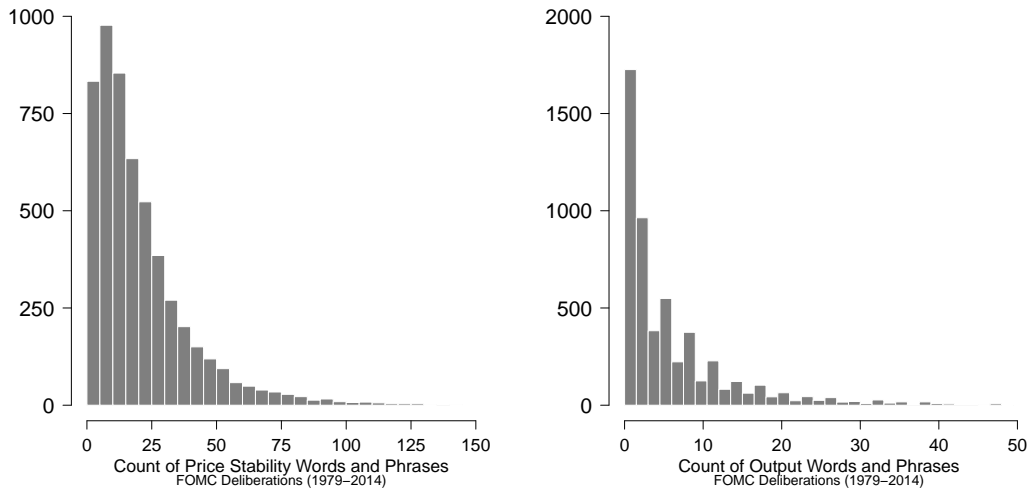

Figure 1: Distributions of q_{it}^p (left) and q_{it}^e (right)

B.2 Regression Robustness Checks, Full Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female			$-.053^*$	$-.050^*$	$-.037^*$	$-.034^*$	$-.040^*$	$-.043^*$
			(.007)	(.007)	(.007)	(.007)	(.007)	(.007)
CBCC					$.036^*$	$.036^*$	$.029^*$	$.029^*$
					(.003)	(.003)	(.003)	(.003)
Dem Appt.					$-.061^*$	$-.058^*$	$-.086^*$	$-.090^*$
					(.007)	(.007)	(.008)	(.008)
Board of Gov.							$.045^*$	$.046^*$
							(.005)	(.005)
Inflation	.000	$-.000$	.000	$-.000$	.001	.000	.000	.001
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Unemployment	$.014^*$	$.020^*$	$.014^*$	$.020^*$	$.014^*$	$.021^*$	$.021^*$	$.014^*$
	(.002)	(.002)	(.002)	(.001)	(.002)	(.001)	(.001)	(.002)
Fed Funds Rate$_{t-1}$	$.013^*$	$.014^*$	$.012^*$	$.014^*$	$.012^*$	$.014^*$	$.013^*$	$.012^*$
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Intercept	$.620^*$	$.590^*$	$.629^*$	$.597^*$	$.638^*$	$.602^*$	$.587^*$	$.622^*$
	(.013)	(.010)	(.013)	(.010)	(.013)	(.010)	(.010)	(.013)
Chair FE?	No	Yes	No	Yes	No	Yes	No	Yes
Adj. R^2	.146	.144	.155	.152	.183	.179	.189	.194
Num. obs.	5353	5353	5353	5353	5353	5353	5353	5353

Table 10: FOMC Transcripts (1979-2014), Unmatched Sample

Results from linear regression models on the relative emphasis of individual FOMC members' speech on issues of price stability compared to output/unemployment. Dependent variable (Q_{it}^p) the fraction of the number of words classified as relating to price stability over the total number of words classified as relating to either price stability or output and unemployment. Each model is estimated with and without fixed effects for the chair of the board. Asterisks indicate $^*p < 0.05$.

B.3 Covariate Balance and Matching Results

		Treatment	Control	Improvement
CBCC	*full*	-0.46	-0.20	97.02%
	matched	-0.46	-0.46	
Dem Appt.	*full*	0.19	0.09	100%
	matched	0.19	0.19	
Inflation	*full*	2.98	3.72	98.20%
	matched	2.94	2.95	
Sample Size	*full*	654	4699	
	matched	639	2373	

Table 11: Results from CEM, FOMC Transcript Data (1979 - 2014)

B.4 Regression Robustness Checks, Matched Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female			−.046*	−.039*	−.043*	−.035*	−.038*	−.046*
			(.008)	(.008)	(.008)	(.008)	(.008)	(.008)
CBCC					.034*	.034*	.026*	.025*
					(.005)	(.005)	(.006)	(.006)
Dem Appt.					−.055*	−.053*	−.071*	−.075*
					(.012)	(.012)	(.014)	(.014)
Board of Gov.							.026*	.029*
							(.009)	(.009)
Inflation	.006*	.005	.007*	.006*	.010*	.009*	.009*	.010*
	(.003)	(.003)	(.003)	(.003)	(.003)	(.003)	(.003)	(.003)
Unemployment	.022*	.030*	.022*	.031*	.023*	.033*	.032*	.023*
	(.003)	(.002)	(.003)	(.002)	(.003)	(.002)	(.002)	(.003)
Fed Funds Rate$_{t-1}$	.016*	.016*	.015*	.015*	.015*	.015*	.015*	.015*
	(.002)	(.001)	(.002)	(.001)	(.002)	(.001)	(.001)	(.002)
Intercept	.516*	.485*	.524*	.489*	.529*	.493*	.488*	.523*
	(.019)	(.015)	(.019)	(.015)	(.019)	(.015)	(.015)	(.019)
Chair FE?	No	Yes	No	Yes	No	Yes	No	Yes
Adj. R^2	.144	.136	.154	.143	.172	.161	.163	.175
Num. obs.	3012	3012	3012	3012	3012	3012	3012	3012

Table 12: FOMC Transcripts (1979-2014), Matched Sample

Results from linear regression models on the relative emphasis of individual FOMC members' speech on issues of price stability compared to output/unemployment. Dependent variable (Q_{it}^p) the fraction of the number of words classified as relating to price stability over the total number of words classified as relating to either price stability or output and unemployment. Each model is estimated with and without fixed effects for the chair of the board. Asterisks indicate *p < 0.05.