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Politics and the FOMC: Do Political Preferences Influence the Decisions of Central Bankers?

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Abstract

This thesis tests empirically whether the political preferences of Federal Open Market Committee (FOMC) members, indicated by party affiliation, the partisan direction of donations to political campaigns, and the party of the President affect their voting behavior when setting monetary policy. I use two main empirical strategies in this project. The first is a linear probability model that examines the correlation between a range of background characteristics of FOMC members--including political affiliation, educational attainment, and work background--on the probability of casting a dissent vote against the majority decision of the FOMC at a particular meeting.

The second approach controls for the state of the economy and focuses on whether an FOMC member's vote on interest rates at a particular meeting was for an increase, a decrease, or no change. To control for the state of the economy and its effect on FOMC interest rate decisions, I use predictions from Taylor-like rules that translate measures of economic activity and inflation into prescriptions for interest rates. I then use a multinominal logit specification to assess how partisan affiliation (and several other factors) affect voting choices after controlling for the Taylor-Rule prescriptions. To implement both empirical strategies for this analysis, I constructed a unique data set that ranges from 1970 to 2018, where each observation is a person-meeting.

My somewhat surprising results indicate that partisanship emerges based on the party of the sitting President rather than through the party affiliation of FOMC members. In particular, during Republican Administrations, FOMC members downweight the signal from economic conditions when considering decreases in interest rates and also are considerably more likely to

vote for rate decreases than is the case during Democratic Administrations. Additionally, I find that my bank president variable is no longer significant, which is surprising because the prior literature finds that bank presidents are hawkish.

1. Introduction

The nonpartisan character of the Federal Reserve is crucial to the fulfillment of its dual mandate "to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."[1] Recently, the political independence of the Fed has been under attack. President Donald Trump has made his displeasure with the Federal Reserve and its chairman, Jerome Powell, for continuing to raise the federal funds rate quite clear over the past few months. Since December 2015, the Fed has been slowly raising interest rates, and the decision of the Federal Open Market Committee (FOMC) in December 2018 to raise rates again prompted condemnation from Trump. In late November 2018, Trump told the *Washington Post* that "I'm doing deals and I'm not being accommodated by the Fed."[2] The president has broken with tradition by criticizing the Federal Reserve, and its chairman whom he nominated in 2018, so publicly. Some reports even stated that Trump was considering an attempt to remove Powell as chairman, even though it is unclear that such an action would be legal. If Trump were to remove Powell, it would be a further blow to the Fed's independence. All together, Trump's actions call into question the political independence of the Federal Reserve.

Continuing on the theme of not valuing the political independence of the Federal Reserve, in March 2019, President Trump indicated his desire to have Stephen Moore, one of his former campaign advisors, fill a seat on the Board of Governors. Though Moore has not been officially nominated as of writing this, this decision has been met with unease from bankers, economists, and financial market participants, many of whom claim Moore is unqualified for the

[1] Federal Reserve Act, Public-Law 63-43 and amendments. 23 December, 1913. Fraser: Discover Economic History. Accessed 24 April, 2019.
[2] Christopher Condon, "A Timeline of Trump's Quotes on Powell and the Fed," Bloomberg, Accessed 24 April, 2019.

job. Additionally, Moore is overtly partisan and has indicated that he would be susceptible to undue influence from the Trump administration. After the federal funds rate was raised in December, Moore asked in an interview with CNN, "Who is the Fed responsive to, if not the president?"[3] However, since his nomination Moore has backpedaled on this statement, and said that the Federal Reserve must be independent of the president.[4] In an interview with Politico, Moore stated "I will be independent" but later confessed that he was a "...big fan of Donald Trump's."[5] This kind of behavior from the president and his potential nominees raises concerns about the continued political independence of the Federal Reserve. Ultimately, Moore's nomination was scuttled, but the process clearly indicated the type of person the President would like to appoint to the Board of Governors of the Federal Reserve.

Monetary policy is conducted by the Federal Reserve, specifically the Federal Open Market Committee (FOMC), which consists of the seven members of the Board of Governors of the Federal Reserve in Washington, D.C., and on a rotating basis, five Presidents of the Fed's 12 regional Reserve Banks. A key tool through which the FOMC implements policy is the federal funds rate, the rate at which banks can borrow money from each other overnight. The rate can be lowered to give a boost to the economy during a recession, and can be raised if inflation gets too high. Changing the rate changes the cost of borrowing money from other banks, which is a critical factor in determining the supply of loanable funds. Lowering the rate grows the economy because it makes it less expensive for businesses and individuals to borrow.

[3] Victoria Guida, "Trump's pick of Moore for Fed sparks concern among bankers," Politico, Accessed 24 April, 2019.
[4] Ibid.
[5] Ibid.

It is imperative that the Federal Reserve remain politically independent. Employees of the Federal Reserve are prohibited from running for political office and soliciting donations for campaigns. These policies exist because the Federal Reserve must be independent in order to make decisions that are best for the long term growth of the economy. The Federal Reserve is apolitical in theory, but in practice, political considerations could affect monetary policy in a number of ways. First, the FOMC could, for example, decide to lower the rate in the last few months before an election to give the economy a temporary boost, helping the incumbent party in power. While this may be a politically expedient strategy, it does not necessarily make good economic policy. It would be dangerous for FOMC members to be taking direction from the president or other government officials, and could have serious ramifications on the economy for years to come. As for the literature on the subject, previous papers (including Bade and Parkin (1982)[6] and Grilli, Masciandaro, and Tabellini (1991)[7]) have shown that central banks with a greater degree of independence typically experience lower inflation. Alesina and Summers have the same finding, but do not conclude that unemployment or economic growth are correlated with central bank independence.[8]

For example, we can see historically that there can be serious economic consequences when the Fed is not acting independently. In the months before the 1972 election, President Richard Nixon pressured chairman Arthur Burns to lower the federal funds rate to aid in his reelection effort. Burns complied with the request. Nixon won the election, but at a great cost to

[6] Robin Bade and Michael Parkin, "Central Bank Laws and Monetary Policy," Department of Economics, University of Western Ontario, 1988.
[7] Vittorio Grilli, Donato Masciandaro, and Guido Tabellini, "Institutions and Policies," Economic Policy, 6, 13, Oxford University Press, 1991.
[8] Alberto Alesina and Lawrence H. Summers, "Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence," Journal of Money, Credit, and Banking, 25, 2, Ohio State University Press, 1993.

the economy. Inflation skyrocketed in the 1970s, and ultimately was lowered through a period of extreme tightening under chairman Paul Volcker in the early 1980s. This caused unemployment to rise as a result, and caused an uproar among many who lost their jobs as a result.[9] At this point in time, Volcker made a judgement that reducing inflation was more important than keeping unemployment low, and this decision had important political implications. Taking an even broader perspective, FOMC members preferences on unemployment vs. inflation may have a political component as well.

These issues raise the interesting question of whether and how partisanship has affected monetary policy decisions in the past, and my thesis explores more implicit political and background influences on the decisions of monetary policy makers. My first empirical strategy relates to the prior literature that has found that among central bankers, FOMC members appointed by Democratic presidents tend to be more dovish, or willing to tolerate higher inflation in favor of lower unemployment, than those appointed by Republican presidents, who are generally more hawkish, or willing to tolerate higher unemployment in favor of lower inflation. I will test empirically whether there is any correlation between political and background characteristics of FOMC members on the probability of casting a dissent vote. I measure political leanings by a member's party affiliation and whether or not they have donated to federal political campaigns and parties.

During a FOMC meeting, each member casts a vote for the policy action recommended by the group, or dissents. Dissents can happen for many reasons. Sometimes members dissent for looser policy because they believe the federal funds rate should be lower, meaning they are

[9] James Pethokoukis, "What's wrong with imposing political pressure on the Fed," American Banker, Accessed 24 April, 2019.

willing to tolerate higher inflation in favor of lower unemployment. Members also dissent for tighter policy because they believe the federal funds rate should be higher, meaning they are willing to tolerate higher unemployment in favor of lower inflation. Dissents can also happen for other reasons, including over wording of the statement that explains the policy decision, or disagreement about the use of unconventional monetary policy tools that were first employed during and after the 2007-2008 financial crisis.[10] For this particular project, I limit my analysis to dissents for looser and tighter monetary policy.

Though the previous literature has extensively focused on finding correlations between background characteristics of FOMC members on the probability of casting a dissent vote, few papers have controlled for the state of the economy. To gauge whether policy is tight or loose, I will use a "Taylor Rule" as a benchmark. A Taylor Rule is a formula that generates a prescription for how the FOMC should set interest rates given measures of GDP and inflation. Using these prescriptions as a benchmark, "tight" policy would be an interest rate setting higher than the prescription of the rule and "loose" policy would be an interest rate setting lower than the prescription of the rule. This paper adds to the existing literature because no previous papers have controlled for partisan campaign contributions, or used a Taylor Rule framework to assess whether political affiliation and background affects monetary policy decisions.

My thesis is organized as follows. Section 2 is reviews the literature on how political characteristics impact FOMC voting. Section 3 describes the data collection for my original dataset. Section 4 describes my empirical strategies and regressions. Section 5 explains my

[10] David C. Wheelock, "FOMC Dissents: Why Some Members Break from Consensus," Federal Reserve Bank of St. Louis, Accessed 24 April, 2019.

findings. Section 6 highlights limitations of my results and directions for future work. Section 7 concludes. Section 8 contains the tables and figures.

2. Literature Review

In "Perceived FOMC: The Making of Hawks, Doves, and Swingers," Michael Bordo and Klodiana Istrefi study the effect of different background characteristics on whether FOMC members are more hawkish (willing to tolerate higher unemployment in favor of lower inflation), or more dovish (willing to tolerate higher inflation in favor of lower unemployment). In particular, they examine the effect of the political party of the President on the relative hawkishness or dovishness of Board Members. Bordo and Istrefi find that FOMC members appointed by Democrats are more likely to be dovish, and that members appointed by Republicans are more likely to be hawkish.[11] Havrilesky and Gildea find that some members of the Board of Governors would vote in a manner aligning with the preferences of the President who appointed them, especially when the Fed chair was from the opposite party. When appointed by Democrats or supply-side Republicans like President Ronald Reagan, these governors were more likely to dissent for looser policy, while those appointed by non-supply-side Republicans were more likely to dissent for tighter policy.[12]

This relates to my thesis because one of the questions I am exploring is how political party affiliation affects FOMC voting behavior. I also have decided to control for campaign contributions because those who have donated to political parties and campaigns may have a stronger partisan affiliation than those who do not make such contributions. Therefore, I hypothesize that campaign contributions would be a stronger measure of party attachment than party affiliation.

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[11] Michael Bordo and Klodiana Istrefi, "Perceived FOMC: The Making of Hawks, Doves, and Swingers," Working Paper 24650, National Bureau of Economic Research, 2018.
[12] Thomas Havrilesky and John Gildea, "Screening FOMC Members For Their Biases And Dependability," Economics and Politics, 3, 2, 1991.

I am also exploring whether there is a differential effect in voting behavior between members of the Board of Governors and bank presidents. Susan Belden explored whether these two groups voted differently, specifically focusing on dissent votes, in her paper "Policy Preferences of FOMC Members as Revealed by Dissenting Votes." She finds that bank presidents are more likely to dissent in favor of tighter policy, while members of the Board of Governors are more likely to dissent in favor of looser policy.[13] Because dissent votes are far more interesting than non-dissent votes due to their rarity, I choose to focus on the impact of different characteristics of FOMC members on the probability of casting a dissent vote in favor of either looser or tighter monetary policy.

However, Belden's analysis is limited to only dissent votes, and for this reason has been criticized by other economists.[14] By only focusing on dissent votes, the results could be biased because Belden "...ignores influences that cause a member to go along with the majority in split decisions."[15] Therefore when building my dataset, I collected not only dissent votes but all votes cast by FOMC members regarding the federal funds rate between 1970 and 2018.

Havrilesky and Gildea also critique Belden's analysis because though they admit that she acknowledges that the state of the economy clearly played a role in the number of dissent votes cast, they point out that she does not control for the state of the economy. In their commentary on Belden's paper, they control for the state of the economy via two variables, the change in inflation for tightness dissents and the change in the unemployment rate for ease dissents. In their results, Havrilesky and Gildea find that dissents for tighter monetary policy are more frequent

[13] Susan Belden, "Policy Preferences of FOMC Members as Revealed by Dissenting Votes," Journal of Money, Credit, and Banking, 21, 4, Ohio State University Press, 1989.
[14] Thomas Havrilesky and John A. Gildea, "The Policy Preferences of FOMC Members as Revealed by Dissenting Votes: Comment," Journal of Money, Credit, and Banking, 23, 1, Ohio State University Press, 1991.
[15] Ibid.

when inflation is growing rapidly, and that dissents for looser monetary policy are more frequent when unemployment is growing rapidly.[16] In "A Long History of FOMC Voting Behavior," Henry W. Chappell Jr. and Rob Roy McGregor control directly for the growth rate of real GNP and the unemployment rate. They find that the coefficient for the GNP is positive, indicating that the FOMC raises rates when the economy is growing. They also find that the coefficient on the unemployment rate variable is negative, meaning that the FOMC decreases rates when the economy is slowing down.[17]

I take a different approach to controlling for the state of the economy, by getting a prescription for the federal funds rate from the standard Taylor Rule and a closely related rule often referred to as the Yellen Rule. Then I create a new variable in which I subtract the prescription given by the Taylor Rule from the target federal funds rate chosen at the previous FOMC meeting. This way, I can determine whether the stance of monetary policy immediately prior to an FOMC meeting is tight or loose relative to the current state of the economy, measured via the Taylor Rule prescription. Put another way, a positive value of this variable implies that interest rates should be raised (because the prescription for rates is above the prevailing rate), while negative values of this variable indicate that, at least according to the Taylor rule, rates should be lowered. As described below, a Taylor Rule is a formula that generates a prescription for how the FOMC should set interest rates given measures of GDP and inflation. I control for the state of the economy indirectly using the Taylor rule, rather than using estimates of real GDP and unemployment.

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[16] Ibid.

[17] Henry W. Chappell, Jr. and Rob Roy McGregor, "A Long History of FOMC Voting Behavior," Southern Economic Journal, 66, 4, Southern Economic Association, 2000.

Using these prescriptions as a benchmark, "tight" policy would be an interest rate setting higher than the prescription of the rule and "loose" policy would be an interest rate setting lower than the prescription of the rule. In my second empirical strategy, I regress my dependent variable on the difference between the Taylor Rule and the target rate set at the FOMC's previous meeting and the rest of my independent variables (background characteristics and political variables). This framework allows me to investigate how background characteristics and political leanings of FOMC members impact their voting behavior while controlling for the state of the economy, and whether the Taylor Rule would call for an increase or decrease in rates. Because my dependent variable has three possibilities (interest rates up, down, or unchanged) I use a mulitnomial logit model to relate these three possible choices to the Taylor Rule variable and my other independent variables. My work goes beyond Bordo and Istrefi's paper in this way because they do not control for the state of the economy.

In terms of the effect of education on FOMC voting behavior, Bordo and Istrefi focus on the differences between 'freshwater' and 'saltwater' universities. Freshwater universities include the University of Chicago, and other universities that are mostly on bodies of freshwater. Saltwater universities include Harvard and MIT, and other universities that are mostly on bodies of saltwater. They found that FOMC members with a PhD from freshwater schools are more likely to dissent for tighter policy, and that members with a PhD from saltwater schools were more balanced. They also find that compared to FOMC members with PhDs, those with other degrees (MBAs, master's, and bachelor's) tend to be more hawkish.[18]

[18] Michael Bordo and Klodiana Istrefi, "Perceived FOMC: The Making of Hawks, Doves, and Swingers," Working Paper 24650, National Bureau of Economic Research, 2018.

3. Data Collection

3.1 Description of Data

For this project, I created my own original dataset, where each observation is a person-meeting. I collected information about the date of each FOMC meeting, the members present, their membership status (as the chair, bank president, member of the Board of Governors, or alternate member of the FOMC), whether or not they cast a dissent vote, whether a dissent vote was made in favor of looser or tighter policy, gender, race, career background, educational attainment, party affiliation, donor status, birth year, the year of the degree most recently received, the party of the president in office at the time of the meeting, the target federal funds rate from the previous meeting, the target federal funds rate decided upon at the current meeting, and the rate prescribed by the standard Taylor Rule and the closely related Yellen Rule. Most of the aforementioned variables are dummy variables, with the exception of the target federal funds rate, Taylor or Yellen Rule Prescription, FOMC member, meeting date, birth year, and year of the degree most recently received. There are 5077 observations in my dataset, and the FOMC meeting dates range from January 1970 to December 2018.

I obtained my information on the meeting dates, the FOMC members present, and whether or not the member cast a dissent vote from the Historical Materials by Year webpage of the Federal Reserve's website. I included all meetings during which the target federal funds rate was changed, including meetings that were held via conference call and not previously scheduled in response to emergencies and sudden developments. For each person-meeting, I had a variable called Dissent, TighterDissent, and LooserDissent. The Dissent variable was given a one if the FOMC member cast a dissent vote during the meeting and was given a zero otherwise.

TighterDissent was given a one if the member dissented in favor of tighter monetary policy, and a zero otherwise. LooserDissent was given a one if the member dissented in favor of looser monetary policy. Note that if a member did not cast a dissent vote, meaning Dissent was coded as zero, that both TighterDissent and LooserDissent received zeros.

I obtained most of my background information about FOMC members from federalreservehistory.org. For membership status, I had four categories: Chair, BankPresident, BoardMember, and AlternateMember. If the FOMC member was the chair, the Chair variable received a 1, and a zero otherwise. The other three categories were defined similarly. The alternate members are all first vice-presidents of the regional reserve banks who stepped in when the bank president could not attend the FOMC meeting. None of these alternate members cast dissent votes.

I had two categories for gender: Male and Female. Both are dummy variables. If the FOMC member was male, the Male variable got a one and the Female variable got a zero. Similarly, if the FOMC member was female, the Male variable got a zero and the Female variable got a one. I had four categories for race: White, Black, Asian, and MixedRace. All four are dummy variables. If the FOMC member was white, the White variable got a one, and a zero otherwise. The other three categories were defined similarly. These categories are mutually exhaustive. In my regressions, I omit White.

For work background, I had 6 categories: banking and finance, government, law, consulting, research and academia, and non-financial businesses. Note that these categories are not mutually exclusive; most FOMC members had worked in more than one of these industries before joining the Federal Reserve. For each category, if the FOMC member had worked in the

given industry for at least a year, the variable for that category got a one, and a zero otherwise. I recorded all of their work experience up to but not including their experience at the Federal Reserve. So, if a member of the FOMC worked for a Federal Reserve bank for their entire career, they would have a zero in each of the six career categories. Banking and finance includes experience at any banks (excluding Federal Reserve banks), financial corporations, and insurance companies. Government is a broad category, including experience in state legislatures, political advising, campaigning, federal bureaucracy, the White House, and many other jobs related to government and politics. Law includes experience with any type of law firm, and consulting includes experience with any type of consulting firm. The research and academia category includes experience at universities and research firms, including an affiliation with the National Bureau of Economic Research (NBER). Non-financial business includes experience in a variety of fields unrelated to finance and banking. Some examples of this in the dataset are experience in airlines and agriculture.

I had four categories for educational attainment: PhD in Economics (or some related field, such as Finance), MBA, Law degree, and other advanced degrees. Note that these categories are not necessarily mutually exclusive, because some FOMC members have multiple advanced degrees. For each advanced degree that a FOMC member had, the corresponding variable got a one. Otherwise, it got a zero. Other advanced degrees include master's degrees in economics, various other master's degree programs, and bachelors degrees in many fields.

The most difficult part of compiling this dataset was assigning each FOMC member to a party affiliation category: Democrat, Republican, Independent, or Unidentifiable. Each member of the Board of Governors was assigned to the category that matched the party affiliation of the

president who appointed them. Thus, if a member of the Board of Governors was appointed by a Democratic president, that member was classified as a Democrat. Similarly, if a member of the Board of Governors was appointed by a Republican president, that member was classified as a Republican. The one exception to this rule is that in 2011, President Obama nominated Jeremy C. Stein, a Democrat, and Jerome Powell, a Republican, to the Board of Governors as part of a bipartisan agreement.[19] Thus in this case, Stein was classified as a Democrat, and Powell a Republican.

Classifying bank presidents was a much harder task, because the nomination process for bank presidents is far removed from partisan politics. Bank presidents of regional Federal Reserve banks are nominated by each bank's board of directors. I used mostly work experience and history of political donations to make these classifications. My first step in classifying bank presidents was to check if they had run for political office in the past. If they had, I classified them as whichever party they ran as. Only a few of the bank presidents in my dataset had run for office. If the member had not run for office, my second step was to investigate the member's work experience for any indications of political leanings. An example of such a job would be if the bank president in question was the chair or a member of the Council of Economic Advisors. In this case, the party affiliation of the bank president would match that of the sitting President at the time, who would have nominated the FOMC member to that position. The same goes for any other position appointed by the President of the United States, including the Assistant Secretary for Economic Policy in the Treasury department.

[19] Binyamin Appelbaum, "Obama to Nominate Two for Vacancies on Fed Board," New York Times, Accessed 24 April, 2019.

If neither of these approaches worked, I checked OpenSecrets, a website that contains information about campaign contributions made by individuals, to determine whether or not the member had made any political donations. If they had, I assigned them the party affiliation that matched the leaning of their donations. Thus, if the bank president had mostly donated to Republicans in the past, they were assigned to the Republican category. The criteria for determining the leaning of donations is described below.

If a FOMC member did not fit into the Democrat, Republican, or Independent categories, the were placed in the unidentifiable category. Note that because of my criteria for identifying party affiliation, all members of the Board of Governors would be either Republicans or Democrats. Thus, all FOMC members in the unidentifiable category are bank presidents, though not all bank presidents are classified as unidentifiable.

My information on the donor status of FOMC members came from OpenSecrets. I only took into account donations made to candidates running for state or federal office and to state or national political parties. If two thirds or more of a member's donations were made to Democrats, then the member was classified as a Democratic donor. Similarly, if two thirds or more of a member's donations were made to Republicans, then the member was classified as a Republican donor. If less than two thirds of a member's donations were made to either party, then the member was classified as a mixed donor. In the case that the member had only one donation on record, then the member was classified as a donor of the party the donation was made to.

I did not record any information about the number of donations made, or about the magnitude of the donations. When doing a search in OpenSecrets, the user is provided with the

type of donation (money to candidates, money to parties, unknown), the name of the person making the donation, their city, state, zip code, and occupation at the time of the donation, the recipient of the donation (candidate, party, or organization), the date the donation was made, and the amount of the donation. Because OpenSecrets does not allow the user to narrow down the search results, I had to go through every donation made by someone having the same name as the FOMC member, and verify through occupation and location whether or not each search result was the FOMC member I was looking for. Once I had decided which donations matched the FOMC member, I used the criteria described in the previous paragraph to assign them to a donorship category.

I used this data on campaign contributions in two ways: to augment my party identifications and to test whether donations were a stronger measure of political affiliation than party identification. As Bordo and Istrefi did in their paper, each Board member was assigned the party of the president who appointed them. Bank presidents, however, were much more difficult to classify (Bordo and Istrefi did not assign bank presidents party identifications), so I used the data from OpenSecrets to assign party identification to bank presidents whose party I was not able to identify by other means. Secondly, I chose to collect data on campaign contributions because I thought it would be a stronger measure of political leanings, with the logic being that people who feel more strongly about politics are more likely to donate to campaigns.

I also collected the year each FOMC member was born, and which year the member had attained their most recent advanced degree. I used the degree year variable to make a series of dummy variables that indicated whether or not the member had received their degree in a particular decade, from the 1930s up to the 2000s.

Additionally, I collected information on the party of the president at the time of each FOMC meeting. I had two dummy variables, one indicating that the sitting president was a Democrat, and one indicating that the president was a Republican.

The information about the the Fed's setting for the federal funds rate came from the Open Market Operations webpage of the Federal Reserve's website and also from thebalance.com. For each meeting, I recorded the target rate decided upon for that meeting, and the target rate from the prior meeting. I recorded the target rate because sometimes the actual federal funds rate deviates a little from the target that the Fed has set for it.

For every quarter of every year in my dataset, I collected the federal funds rate prescribed by the standard Taylor Rule and the Yellen rule. These rules provide a useful framework for thinking about the Fed's setting of the federal funds rate. Actual decisions about rates are made by a vote by the FOMC and not by a specific rule. That being said, these rules have become a standard shorthand or metric among economists for understanding how economic conditions may affect Fed decisions about interest rates, and over some periods these types of rules do a good job of describing Federal Reserve behavior. Some economists, most notably the developer of these types of rules, John Taylor, have made the normative argument that Federal Reserve *should* follow a rule but that remains a controversial position. In any case, these rules provide a useful metric for assessing whether interest rates are above or below the level prescribed by a well-known and widely used benchmark; that is, whether, according to these rules, interest rates should be increased, decreased, or left unchanged.

The prescriptions for the federal funds rate from these Rules came from a tool on the Atlanta Fed's website. On page 21 is the equation for the Standard Rule, where i_t is the federal

funds rate prescribed by the rule, 2 is the neutral real rate of interest, (π_t - π^*) is the gap between current inflation and the Fed's target for inflation, and (Y_t - Y^*) is the output gap (the difference between actual real GDP and potential or trend GDP expressed in percent terms). The coefficients of 0.5 on the inflation gap and output gap reflect weights identified by John Taylor to indicate the importance of each of those factors on the Fed's setting of interest rates. The only difference for the Yellen Rule is that the weight on the GDP gap is 1 instead of 0.5; that is, the Yellen Rule puts more weight on deviations of real GDP from its trend than does the Standard Rule indicating that, for example, the Fed would lower interest rates more aggressively in response to a recession.

For my inflation measure, I chose Core PCE inflation, which is a measure of inflation that excludes inflation in food and energy. For my output gap measure, I chose a measure of the GDP gap calculated by the Congressional Budget Office (CBO). In a perfect world, I would have used "real-time" data both for the inflation measure and for the GDP gap, where real-time data reflect values of variables as they were published and would have been seen by decision makers at the time of each FOMC meeting. Because economic data can be revised substantially over time, real-time data can be quite different than currently published values of variables like GDP. However, I did not use real time data because it was only available for 1990 and after, meaning that I would not be able to use the data I collected for the 1970s and 1980s. It would be interesting to explore whether the use of real-time data would make a difference to results over the period for which it is available.

The formula for the standard Taylor Rule and Yellen Rule are, respectively:

$$i_t = 2 + \pi_t + 0.5(\pi_t - \pi^*) + 0.5(Y_t - Y^*)$$

$$i_t = 2 + \pi_t + 0.5(\pi_t - \pi^*) + (Y_t - Y^*)$$

3.2 Summary Statistics

The summary statistics for the variables are displayed in Table 1 of Section 8. For each variable, we have the number of observations for which we have information about, the mean, standard deviation, and maximum and minimum values. We can see from the table that about 6.6 percent of the observations were dissent votes. 1.9 percent of the observations are dissents for looser monetary policy, and 4.1 percent are dissents for tighter monetary policy. 0.6 percent of the total observations are dissents made for other reasons, such as disagreement about the wording of the statement released with the FOMC policy decision. However, these dissents are not included in my analysis.

Recall that each observation is a member vote at a particular meeting. Pertaining to membership status, 9.1 percent of the observations are votes by chairs, 44.8 percent are bank presidents, 45.7 percent are board members, and 0.6 percent are alternate members. For the gender categories, 88.5 percent of the observations are male, and 11.5 percent are female. 95.5 percent of the observations are white, 4.1 percent are black, 0.2 percent are Asian, and 0.3 percent mixed race.[20] Clearly, the Federal Reserve has a diversity problem to fix.

Regarding career background, 38.2 percent of the observations have experience in finance or banking, 42.7 percent in government, 7.5 percent in law firms, 6.2 percent in consulting, 50.9 percent in academia and research, and 3.0 percent in non-financial business. In

[20] These percentages do not add up to 100.0% due to rounding.

the educational attainment category, 58.3 percent have a PhD in economics or some related field, 16.4 percent have a MBA, 11.8 percent have a law degree, and 18.3 percent have other advanced degrees.

In the political affiliation category, 46.0 percent of the observations are Republican, 33.8 percent are Democrat, 1.2 percent are Independent, and 19.0 percent are unidentifiable. For campaign contributions, 47.8 percent of the observations made a donation to a political party or campaign. 22.2 percent of the observations were Republican donors, 24.7 percent were Democratic donors, and 0.8 percent were mixed donors, meaning they made donations to both Republicans and Democrats, but did not lean toward either party.

For birth year, the minimum value was 1904 and the maximum value was 1973. The mean value was 1934.3. (Remember, my dataset begins in 1970.) For degree year, the minimum value was 1929 and the maximum value was 2002. The mean value was 1962.5.

4. Empirical Strategies

4.1 Strategy #1: Regressions on Dissent Variables

I have two main empirical strategies for this project. The first is a linear probability model that regresses whether or not an FOMC member cast a dissent vote on the member's background characteristics. These characteristics include their membership status, work experience, educational attainment, race, gender, political affiliation, donorship status, the decade in which they received their most recent degree, and the party of the President in office at the time. I ran each regression three times for each of my three dependent variables: whether or not an FOMC member cast a dissent vote (Dissent) coded 1 for a dissent vote and 0 otherwise, a dissent vote for tighter monetary policy (TighterDissent), or a dissent vote for looser monetary policy (LooserDissent). Another important note is that I ran regressions with political affiliation and donorship status separately due to high correlation between the two variables. I also included a time fixed effect to control for variation explained by variation in time.

Below is a description of the regression. All of the categories below represent each dummy variable falling under it, with one omitted to avoid collinearity issues. For example, $B_2 Careers$ represents all the career categories, banking and finance, law, consulting, academia and research, and non-financial business (i.e. all the variables in that category, except the one that is omitted). The government category is omitted for careers. The i.Year term represents the time fixed effect.

$$Dissent = B_0 + B_1 BankPresident + B_2 Careers + B_3 Education + B_4 Gender + B_5 Race + B_6 PartyAffiliation + B_7 PresidentParty + B_8 DegreeDecade + B_9 i.Year + \varepsilon_i$$

One important note about this strategy is that the coefficients represent correlations between FOMC member background characteristics and the probability of casting a dissent vote. These estimates are not causal. One of the reasons why this estimate is not causal is because in this strategy, I have neglected to control for the state of the economy.

4.2 Strategy #2: Regressions on Vote Direction Variables, Controlling for State of Economy

In my second empirical strategy, I control for the state of the economy and its possible effect on interest rate decisions using estimates of the standard Taylor Rule and the Yellen Rule. As noted, a Taylor Rule is a formula that generates a prescription for how the FOMC should set interest rates given measures of GDP and inflation. Then I create a new variable (called RuleMinusRate and YellenRuleMinusRate, respectively) in which I subtract the target federal funds rate chosen at the previous FOMC meeting from the prescription given by both Taylor Rules. This way, I can benchmark for policy prescribed by the Taylor Rule as above or below the federal funds rate that prevailed since the previous meeting. If the Taylor Rule prescription is above the federal funds rate prevailing before the meeting, then policy should be tighter (according to the Taylor Rule). Conversely, if the Taylor Rule prescription is below the prevailing federal funds rate, then policy should be looser.

I also created two dummy variables to identify differential effects of the rules in different time periods. To do this, I created a dummy variable that was coded 1 for observations in the time period 1980 - 2008 and 0 otherwise, and another variable coded 1 for 2008 - 2018 and 0 otherwise. My first time period for the 1970s (which will now be captured by the RuleMinusRate variable) included all FOMC meetings taking place between the first quarter of 1971 and the

fourth quarter of 1979. My second time period from 1980 to 2008 included all FOMC meetings between the first quarter of 1980 and the second quarter of 2008. The third period from 2008 to 2018 included all meetings between the third quarter of 2008 and the fourth quarter of 2018. The resulting variables, in addition to the RuleMinusRate variables, are called Std1980t2008 and Std2008t2018 for the Standard Taylor Rule. For the Yellen rule, they are Yellen1980t2008, and Yellen2008t2018.

My reasoning for splitting up the time periods this way is as follows. John Taylor, who developed the Taylor Rule, has argued that the Fed was not behaving in line with the Rule until the mid 1980s.[21] In addition, monetary policy underwent a significant change in 1979 under Chair Paul Volcker. Accordingly, I decided to end this period in the second quarter of 1980. For the next period, I decided to end in the second quarter of 2008 just ahead of the most intense part of the financial crisis. This is because once the economy started to go downhill, the prescriptions that the Taylor and Yellen Rules gave were negative. The federal funds rate did not, in fact, go negative, and it was no longer an effective policy tool once it was at zero. As a result, the Federal Reserve was forced to enact unconventional monetary policy, such as quantitative easing, during the 2008 financial crisis, and was not using the Taylor Rule as a gauge of how the economy was doing and what that would imply for the setting of interest rates. More recently, the federal funds rate has consistently been below the standard Taylor Rule prescription.

As a result of splitting the Taylor Rule prescriptions up into three time periods, I am able to examine whether the rules had different effects in different time periods. I expect that the

[21] Richard Clarida, Jordi Galí, and Mark Gertler, "The Science of Monetary Policy: A New Keynesian Perspective," Journal of Economic Literature, 37, 2, 1999.

effect of the Taylor Rule variables in the first period mostly covering the 1970s (captured by my un-interacted RuleMinusRate variables) will be insignificant since the Fed was not particularly paying attention to the Taylor Rule during this period. I expect that the variables for the 1980 to 2008 time period will be significant because we know during this period that the Federal Reserve was paying attention to the Taylor Rule. In Figure 1, we can see that the federal funds rate predicted by the Taylor and Yellen Rules, and the actual federal funds have similar trends. I expect that the variables for the 2008 to 2018 time period will not be significant because during the 2008 financial crisis, the Federal Reserve was not able to use conventional monetary policy. Therefore, the federal funds rate, which did not go below zero, was not following the trend of the rate predicted by the rule, which were negative. In years after the crisis, during the recovery, the federal funds rate has been consistently below the rate predicted by the standard Taylor Rule.

In the second empirical strategy, I use different dependent variables than the ones in my first empirical strategy. My dependent variable now takes on three values captured by an index variable with values 1, 2, and 3 capturing VoteUnchanged, VoteIncrease, and VoteDecrease. The index got a 1 (VoteUnchanged) if the FOMC member voted to leave the rate unchanged at a particular meeting and a zero otherwise. The index got a 2 (VoteIncrease) if the FOMC member voted to increase the target rate, and a zero otherwise. Finally, the index got a 3 (VoteDecrease) if the FOMC member voted to decrease the rate and a zero otherwise.

The thought process for the assignment of values to the index is shown in Table 2. For example, if the FFRTargetChange[22] was equal to 1, and the FOMC member cast a dissent for looser policy, then the index was assigned 1. The reasoning here is that if FFRTargetChange is 1,

[22] A value of one for FFRTargetChange indicates that the FOMC voted to increase the rate, relative to the previous meeting. A zero indicates that the FOMC voted to keep the rate the same, relative to the previous meeting. A negative one indicates that the FOMC voted to decrease the rate, relative to the previous meeting.

the rate at the current FOMC meeting proposed by the majority is higher than the target rate at the previous meeting. In this situation, if a member dissented in favor of looser policy, they want the rate to be lower, indicating their preference to not change the target rate from the previous meeting. Thus the index would be get a one, because the FOMC member effectively voted not to change the rate through their dissent for looser policy.

Having defined these variables, I regress my dependent variable on the difference between the Taylor Rule and the previously set federal funds rate, the Taylor Rule variables for the 1980 to 2008 and 2008 to 2018 time periods, and the rest of my independent variables (background characteristics and political variables). This framework allows me to investigate how background characteristics and political leanings of FOMC members impact their voting behavior while controlling for the state of the economy. Because I have a dependent variable with three possible choices, I use a multinomial logit to estimate my results. Multinomial logit takes one of the categories, VoteUnchanged (index value of 1), and makes it the 'reference category.' It then effectively calculates separate regressions for VoteIncrease and VoteDecrease, relative to the reference category while making sure that the implied probabilities of choosing each of the three choices sum to one. Therefore, I only examine the signs and statistical significance of the coefficients for choices to increase or decrease rates relative to the reference category of leaving rates unchanged.

I also clustered the standard errors by FOMC member because I expected that the error terms would be correlated for each member. The reasoning here is that each member brings their own philosophy about voting in FOMC meetings. In particular, I noticed when I was making my dataset that there were people who cast dissent votes often, and always in the same direction. For

example, Martha Seger, a member of the Board of Governors from 1984 to 1991, dissented for looser monetary policy 18 times out of the 55 total FOMC meetings that she attended. Thus, Seger cast a dissent vote for about a third of the total meetings she attended. Susan Phillips, a member of the Board of Governors from 1991 to 1998, attended 52 FOMC meetings, and cast 0 dissent votes. To put these numbers into context, dissent votes are only six percent of the observations of my dataset. Thus, it appears that each FOMC member may have a consistent pattern in their voting that could cause the standard errors to be correlated for each member.

The description of my regressions for this strategy is below. I included my RuleMinusRate, and time period Taylor Rules, and political party variables (Republican, Democrat, and neither) in each regression. I omitted the 1970s Taylor Rule variable, and my Democrat variable. I also included some interaction terms. First, I included an interaction term between the RuleMinusRate variable and Republican party identification to see if Republicans respond to the state of the economy as expressed by the Taylor Rule differently than do Democrats or those without a party identification. Second, I included an interaction term between the RuleMinusRate variable and the party of the President. The idea here is to see if FOMC members respond differently to the signal from the Taylor Rule depending on the party of the President. Third, I included interaction terms between the party of each FOMC member and the party of the President. The question here is whether any partisanship appears in terms of how FOMC members vote depending on whether the President is or is not from their party. Thus, I include dummy variables for Republican FOMC members when the President is a Democrat, for Democratic members when the President is a Republican, and for when the member is neither a Democrat or Republican when the President is a Republican.

I ran a separate regression for each set of background characteristics that I wanted to test: gender, race, career background, educational attainment, and the decade in which each FOMC member received their most recent degree. (I report some but not all of these results below.)

Additionally, I ran some regressions with my political donor variables, omitting DemocratDonor. I also included interactive variables in these regressions parallel to those described above for party affiliation. My political party variables were not included in these regressions due to high correlation between these variables.

Note that in the multinomial logit setup, the coefficients on each independent variable can differ for each value of the dependent variable. All told, my specification is:

$$VoteUnchanged,\ VoteIncrease,\ VoteDecrease = B_0 + B_1 RuleMinusRate + B_2 Std1980t2008_i + B_3 Std2008t2018 + B_4 RuleMinusRate*PartyAffiliation + B_5 RuleMinusRate*PartyOfPresident + B_6(PartyAffiliation\ and\ Interactive\ Variables) + B_7 Background\ Characteristics + e$$

5. Analysis and Results

5.1 Basic Dissent Regressions: Correlation Between Background Characteristics and the Probability of Dissent Voting (Table 3)

Using a linear probability model, I investigate the impact of all my background characteristics (career, educational attainment, gender, race, political affiliation, partisan leaning of donations, the party of the sitting president, membership status (Board member or Bank President), and the decade in which most recent degree was attained) on my dissent dependent variables (Dissent, LooserDissent, and TighterDissent). Thus, I estimate three regressions, one for each of the dissent variables, with each regression including time fixed effects. However, in this set of regressions, I do not control for the state of the economy. These estimates are correlations between certain background characteristics and the probability of casting a dissent vote; they are not causal. My omitted categories (to avoid perfect collinearity) for these variables are government, all other degrees, female, white, Democratic party affiliation, Democratic donor, Democratic President, Board member, and final degree received in 1990s or 2000s.

The variable identifying Bank presidents is significant at the 5 percent level in all three linear probability models. In the Dissent regression, the coefficient of BankPresident is 0.057, which means that bank presidents are 5.7 percentage points more likely to cast a dissent vote, relative to Board members. For LooserDissent, the coefficient on BankPresident is -0.014. This means that Bank presidents are 1.4 percentage points less likely to cast a dissent for looser policy, relative to Board members. The coefficient for BankPresident in the TighterDissent regression is 0.061, which means that bank presidents are 6.1 percentage points more likely to

dissent for tighter policy, relative to Board members. Taken together, these results indicate that bank presidents are hawkish, a result consistent with prior literature.

The variable identifying members as Republicans is significant at the 5 percent level in all three linear probability models. In the Dissent regression, the coefficient of Republican is 0.032, which means that Republicans are 3.2 percentage points more likely to cast a dissent vote than Democrats. For LooserDissent, the coefficient of Republican is 0.014, which means that Republicans are 1.4 percentage points more likely to cast a dissent for looser policy, compared to Democrats. This is not what we would expect, given that the prior literature tells us that Republicans are hawkish. One possible reason for this unexpected result is that I did not control for the state of the economy in this regression. The coefficient of Republican in the TighterDissent regression is 0.027, which means that Republicans are 2.7 percentage points more likely to cast a dissent for tighter policy, compared to Democrats. Taken together, these results are mixed as they tell us that Republicans are more likely than Democrats to dissent for looser and for tighter policy.

I find that members classified as Independents are hawkish compared to Democrats. In the Dissent regression, the coefficient for Independent is 0.192, which means that Independents are 19.2 percentage points more likely to cast a dissent vote than Democrats. For TighterDissent, the coefficient for Independent is 0.184, which means that Independents are 18.4 percentage points more likely to cast a dissent vote for tighter policy than Democrats. Only one FOMC member (Thomas Hoenig) is classified as an Independent, and he attended a total of 61 FOMC meetings. Accordingly, these results are picking up on his voting behavior in particular as there is no member fixed effect in this regression. (The member fixed effect includes a fixed effect for

each FOMC member.) The Independent variable is essentially a dummy variable for Hoenig, and the results indicate that he is hawkish.

I find that FOMC members classified as unidentifiable are dovish compared to Democrats. In the LooserDissent regression, the coefficient of Unidentifiable is 0.015, which means that FOMC members classified as Unidentifiable are 1.5 percentage points more likely to dissent for looser policy. This is a surprising result given that nearly all the Unidentifiable observations are Bank presidents. No board members are classified as Unidentifiable because each board member was assigned the political affiliation of the President who appointed them. The prior literature tells us that bank presidents are hawkish, so we would expect FOMC members classified as Unidentifiable to be hawkish. These results suggest that they are dovish. More work will be needed to sort out exactly what is going on with FOMC members with no identifiable party affiliation.

For our Male variable, in the Dissent regression, the coefficient of Male is -0.046, which means that men are 4.6 percentage points less likely to cast a dissent vote, relative to women. For LooserDissent, the coefficient of Male is -0.046, which means that men are 4.6 percentage points less likely to cast a dissent vote for looser policy, relative to women. The coefficient on Male in the TighterDissent regression is insignificant. Taken together, these results indicate that male FOMC members are more hawkish than female FOMC members.

5.2 Impact of Political Affiliation on FOMC Voting Behavior After Controlling for the State of the Economy (Yellen Rule): Tables 4a and 4b

In this section, I use the multinomial logit model to investigate the impact of political affiliation on FOMC voting behavior while controlling for the state of the economy via the Yellen Rule mechanism. I cluster standard errors by member.

For the multinomial logit estimates that compare VoteIncrease to VoteUnchanged, the coefficient on my YellenRuleMinusRate variable is positive and significant at the 5 percent level. (See the first column of table 4a for parameter estimates.) This means that the FOMC member is more likely to vote to increase the federal funds rate when the Yellen Rule indicates that they should. (Because I also interact this variable with dummy variables specifically identifying later time spans of the sample, these results indicate the effect for the period from 1971 to 1979.) The coefficient on the Yellen1980t2008 variable is positive and significant at the 5 percent level. This means that during the 1980 to 2008 time period, FOMC members were more likely to vote to increase the rate when the Yellen Rule indicated that they should than they were during the earlier period. These results make sense because the Federal Reserve was, according to the literature, not particularly following the behavior prescribed by Taylor-like rules in that earlier period. The sign on the Yellen2008t2018 variable also is positive and significant, indicating that economic conditions were even more important for rate-setting decisions during this period during and after the financial crisis than they were in the earlier periods.

The coefficient on the variable interacting the Yellen Rule with Republican party affiliation (YellenRebublican) is insignificant, while the variable interacting the Yellen Rule with the a variable indicating that the President is a Republican is negative and significant. This

result indicates that, during Republican Administrations, FOMC members paid less attention to economic conditions as captured by the Yellen Rule when considering rate increases than they did during Democratic Administrations.

The coefficient on BankPresident is positive but insignificant, and is relative to BoardMember, which is omitted from this regression. This is an interesting find because in the regressions from the first empirical strategy, BankPresident was one of the few variables that was consistently statistically significant. Prior literature also finds that bank presidents are more likely to be hawkish, so it is surprising that this coefficient is not significant. Apparently, once the analysis controls for the effects of the economy, Bank Presidents are no more hawkish (likely to vote to increase rates) than are Board members.

For my political affiliation variables, I have omitted the Democrat category, so all the results are relative to Democrats. The coefficient on my Republican variable is positive and significant at the 10 percent level, implying that FOMC members who are Republican are more likely to vote to increase the rate, and therefore are more hawkish than Democrats. Perhaps surprisingly, this result does not hold during Democratic Administrations. (As noted below, however, the magnitudes of these effects on the probability of Republicans voting for rate increases are quite small.) Results for Democrats are more interesting. During Republican Administrations, Democratic FOMC members are more likely to vote for rate increases than they are during Democratic Administrations. (Coefficient on Democrat w/Republican President is positive and significant at the 5 percent level.) For FOMC members whom I could identify neither as a Democrat or a Republican, coefficients are insignificant, both during Democratic and Republican Administrations.

I also obtained estimates for a linearized version of my model to gauge the effect of a unit change in each independent variable on voting probabilities. Doing this is necessary because the multinomial logit model is highly nonlinear so the coefficient estimates associated with each variable do not indicate the marginal effect of that variable on voting probabilities as would be the case in a linear probability model. (I did this with the margins command and dy/dx option in Stata.) These results are reported in the dy/dx columns of the tables. The coefficient for YellenRuleMinusRate is 0.014, which means that when the Yellen Rule indicates that the federal funds rate should be raised by 1 percentage point, FOMC members were about 1.4 percentage points more likely to vote to increase the rate than would be the case if the Yellen Rule prescribed no change in the federal funds rate. This coefficient was significant at the 5 percent level. The coefficient for Yellen1980t2008 is 0.058 and significant at the 5 percent level. Thus, during meetings occurring from 1980 to 2008, FOMC members were 7.2 percentage points more likely to raise the rate when the Yellen Rule indicated that they should rates by 1 percentage point. (This is the sum of the marginal effects from the YellenRuleMinusRate coefficient and the Yellen1980t2008 coefficient). The coefficient for Yellen2008t2018 also was positive and significant. Thus, during this period, FOMC members were 13.8 percentage points more likely to raise rates when the Yellen Rule said they should raise rates 1 percentage point than when the Yellen Rule called for no change in rates.

For the terms interacting the Yellen Rule with Republican party identification of FOMC members and Republican Administrations, Republican party identification has virtually no effect on voting probabilities, while the Republican Administration interaction coefficient indicates that FOMC members downweight the signal from the Yellen Rule by an amount generating a 2.3

percentage point reduction in the likelihood of raising rates when a Republican in President and the Yellen Rule says raise rates by 1 percentage point. Apparently, economic conditions play a larger role for FOMC members during Democratic Administrations. Digging deeper into the source of this result is a top priority for future research.

Of the remaining variables, the only coefficient that was significant in the multinomial logit and that has a decent-sized marginal effect is for the variable identifying Democratic FOMC members during Republican Administrations (Democrat w/Republican Pres). The marginal effect indicates a 5.3 percentage point higher probability of voting for a rate increase during Republican Administrations than during Democratic Administrations. Perhaps Democrats are more hawkish during Republican Administrations. It is important to point out, however, that the marginal effect in the linearized model is not significant, even though the corresponding coefficient in the multinomial logit is significant. Both the multinomial logit coefficient and the calculation of marginal effects are calculated with non-linear optimization routines and, interestingly, one delivers a significant result while the other does not.

For the multinomial logit estimates that compare VoteDecrease to VoteUnchanged (table 4b), the coefficient on my YellenRuleMinusRate variable is not significant, indicating that in the earlier time period from 1971 to 1979, economic conditions as captured by the Yellen Rule did not appear to have an effect on monetary policy. The coefficient on the Yellen1980t2008 variable is negative and significant at the 5 percent level. This means that during the 1980 to 2008 time period, FOMC members were more likely to vote to decrease the rate when the Yellen Rule indicated that they should, relative to the earlier time period. (A negative coefficient estimate implies a higher probability because the YellenRuleMinusRate variable is negative

when the rule prescribes a decrease in the federal funds rate.) The coefficient on the Yellen2008t2018 variable is negative and significant at the five percent level. This means that during the 2008 to 2018 time period, FOMC members were more likely to vote to decrease the rate when the Yellen Rule indicated that they should than they were during the 1970s. This result is capturing the persistent decreases in the federal funds rate (as would have been prescribed by the Yellen Rule) during this time period.

The coefficient on the term interacting the Yellen Rule with Republican party identification is insignificant, while the coefficient on the term interacting the Yellen Rule with a Republican Administration is positive and significant. This estimate indicates that during Republican Administrations, FOMC members place less weight on a signal from the Yellen Rule to reduce rates than they do during Democratic Administrations. (The value of the Yellen Rule variable (RuleMinusRate) is negative when it is calling for a decrease in rates. This negative value multiplied by the positive coefficient implies a smaller probability of decreasing rates.)

Here too, the coefficient on BankPresident was insignificant, in contrast to prior literature indicating that Bank Presidents tend to be more hawkish (less likely to vote to decrease rates). The coefficient for Republican is positive and significant, while the coefficient on the variable identifying Republicans during Democratic Administrations (Republican w/Democratic Pres) is negative and significant. Coefficients on the other interactive variables between party identification of each FOMC member and the party of the President at the time indicate a greater likelihood that Democrats vote for rate decreases during Republican Administrations than during Democratic Administrations. As well, those FOMC members whose party was not identified also are more likely to vote to decrease rates during Republican Administrations than during

Democratic Administrations. Taken together, these results could reflect some complicated pattern of partisanship in FOMC voting patterns or, alternatively, it could reflect some other difference between Republican and Democratic Administrations that is not captured by any other variable in the model.

As above, I also obtained linearized estimates to gauge the effect of a unit increase in each of the independent variables on the probabilities of the dependent variables. The coefficient for YellenRuleMinusRate is insignificant. For Yellen1980t2008, the coefficient is -0.075 and is significant at the 5 percent level. This means that during the 1980 to 2008 period, FOMC members were 6.7 percentage points more likely to vote to decrease the rate when the Yellen Rule indicated they should lower rates by 1 percentage point (.067 = -.075 + .008) than was the case during the 1970s. The coefficient on Yellen2008t2018 is -0.083 and is significant at the 5 percent level. This means that during the 2008 to 2018 period, FOMC members were 7.5 percentage points more likely to vote to decrease the rate when the Yellen Rule indicated they should drop the rate by 1 percentage point (-.075= -.083 +. 008). For the terms interacting the Yellen Rule with party variables, we see that during Republican Administrations, FOMC members are 2.8 (=.020+.008) less likely to decrease rates when the Yellen Rule says they should reduce rates by 1 percentage point than if the Rule suggested no change in rates.

The coefficient on BankPresident is insignificant at the 5 percent level; again, no effect of being a Bank President as compared to a Board Member in contradiction to the prior literature. For political affiliation, the coefficient on Republican is positive and insignificant, indicating that Republicans are 21.9 percentage points more likely to vote for a rate decrease than are Democrats. However, this effect disappears when the President is a Democrat. Similarly,

Democrats are 20.4 percentage points more likely to vote for a decrease in rates when the President is a Republican, while FOMC members that were identified as neither Democrat nor Republicans also are more likely to vote a rate decrease when the President is a Republican. These results mirror those described above where the consequential partisan difference seems to depend more on the party of the President than the party of FOMC members. As noted, this warrants further investigation to sort out if it reflects a particular pattern of partisan behavior or some other factor not captured in the model.

5.3 Impact of Gender and Educational Background on FOMC Voting Behavior After Controlling for the State of the Economy (Yellen Rule): Tables 5a, 5b, 6a, and 6b

Prior literature has considered the role of other demographic variables. In tables 5a and 5b I repeat the above specifications with a dummy variable for male added, while in tables 6a and 6b I add variables for educational background (whether an FOMC member received a PhD, an MBA, a law degree, or any other degree (omitted category)). Somewhat to my surprise, none of these variables are significant in any of the specifications, and the pattern of other coefficients is relatively little affected. Thus, I do not describe these results in detail, though I note that the insignificance of the coefficient on male in these specifications contrasts with what I found in my first empirical strategy. Apparently, once the state of the economy and the various identifications of political party, the voting pattern of FOMC members does not vary systematically based on their gender or educational background.

5.4 Impact of Donor Partisanship on FOMC Voting Behavior While Controlling for the State of the Economy (Yellen Rule): Tables 7a and 7b

As noted, one of my motivations at the beginning of this project was to investigate whether the intensity of partisanship matters for FOMC voting behavior. To recap, my conjecture is that FOMC member who have made political donations will be more intensely partisan than those from the same party who did not make donations. To roughly gauge whether there is anything to this idea, I reran the multinomial logit models described in tables 4a and 4b but with the variable identifying donor status rather than party identification. These results are reported in tables 7a and 7b.

For the most part, these results with donor status are not substantially different than those reported in tables 4a and 4b with party identification. In a handful of cases, the marginal effects are a bit larger with the donor variables than with party identification variables but the differences are not great. For example, Democratic donors with a Republican President are 7.8 percentage points more likely to vote for a rate increase than they are with a Democratic President, and the result is statistically significant. Similarly, the mixed donor marginal effect is positive, large (15.1 percentage points), and significant. Because there are no mixed donors who are FOMC members when a Democrat is President, this effect identifies the impact on voting behavior of an FOMC member being a mixed donor when a Republican is President. The comparable coefficient with the party identification for Republican FOMC members when a Republican is President is smaller and insignificant. Interestingly, this provides further evidence that the key difference in behavior seems to occur when Republicans are President compared with when Democrats are President. More generally, the outcome that there is not so much

difference between the results using party identification and those using donor status is not so surprising given the partial overlap between my party identification and donor status variables (as discussed in more detail below in the section on limitations).

5.5 Impact of Political Affiliation on FOMC Voting Behavior Using the Standard Taylor Rule to Control for the State of the Economy: Tables 4a through 7b

Economists have considered many versions of Taylor-like Rules that provide prescriptions for the federal funds rate based on variables capturing the state of the economy. Based on my read of the literature, I believe that the Yellen Rule is more appropriate in my setup. That being said, I also re-estimated all of the multinomial logit models using prescriptions for the federal funds rate using the Standard Taylor Rule, which puts less weight on economic activity (whether GDP is above or below its trend) than does the Yellen Rule. Just as for the models using the Yellen Rule, I cluster standard errors by member. Results for these regressions are reported in columns 3 and 4 (labeled with the column head "standard" for standard Taylor Rule) in tables 4a through 7b.

Focusing on marginal effects of independent variables, in the multinomial logit results comparing an VoteIncrease to VoteUnchanged, the pattern of coefficient on the RuleMinusRate variables are quite different than when the Yellen Rule is used. For the coefficient describing the 1970s, the marginal effect implies that when the Standard Taylor Rule prescribes a 1 percentage point increase in rates, FOMC members are 2.3 percentage point *less* likely to increase rates than if the Taylor Rule had called for no change in rates (and the estimate is significant). This is a strange result and likely highlights the degree to which FOMC members were not following the

Taylor Rule in this period. In the period from 1980 to 2008, the coefficient switches to the "correct" positive sign and is significant. Then in the period from 2008 to 2018 during the financial crisis, the coefficient switches back to being negative and significant, suggesting that policymakers were not following the standard Taylor Rule in this period either. Indeed, my results for the Yellen Rule suggest that policy decisions came closer to those called for by the Yellen Rule, which puts more weight on the deviation of real GDP from its trend. For the variables capturing partisanship, the signs and patterns of significance are fairly similar across the specifications using the Yellen and Standard Taylor Rules to control for economic conditions.

For the multinomial logit results comparing VoteIncrease to VoteUnchanged, the pattern of coefficients and significance is very similar whether the Yellen or Standard versions of the Taylor Rule are used to control for the effects of economic conditions. (For example, compare columns 2 and 4 in table 4b.) This similarity extends both to the coefficients on the RuleMinusRate variables and those on the partisanship variables.

5.6 Description of Other Regressions Tried

I also considered the impact of race, career, and the decade in which the FOMC member received their most recent degree on FOMC voting behavior. I did these earlier on in my research in a different specification than those reported here. In those regressions, I did not find much of interest. For my race variable, there are very few observations for non-white FOMC members and also race is not always observable, making it difficult to compile accurate data. The results from my career regressions were difficult to interpret, which could possibly be due to

definition issues. I split career into six broad categories (banking/finance, government, law, consulting, academia/research, and non-financial business) that may not have been narrow enough to provide accurate results. I intend to experiment further with these variables to verify that there are no differences in FOMC voting behavior across the different groups identified by these variables.

VI. Limitations of My Results and Directions for Future Work

The first limitation of my results is that my political affiliation and partisan donor variables are highly correlated due to the way that I defined them. On the hand, this outcome is not surprising. On the other hand, it indicates that my political affiliation variables and partisan donor variables may not be providing so much independent information. I had said that if a FOMC had not run for office in the past or had a job indicating political leanings, my third strategy for identifying political affiliation was to check if they had made any donations to partisan campaigns. If they leaned Democrat with their donations, then I assigned them as a Democrat for their party affiliation. I did not keep track of how often this was the case, but it did happen frequently. I had chosen to collect information on donations because I thought it would be a stronger measure of political leanings, owing to the fact that people who donate to campaigns probably feel more strongly about politics than those who do not.

I also had used the information on campaign contributions as a way to increase the number of FOMC members whom I could assign a party identification to. Bordo and Istrefi used the same strategy that I did with Board members, by assigning them the same party identification as the President who appointed them. However, Bordo and Istrefi did not assign party identification to bank presidents. Using the campaign contribution data was a way for me to determine the political orientation of many bank presidents. However, this means that there is a lot of overlap between my party and donor variables. In the future, I would dig more deeply into this problem to see if donations do say anything about the intensity of partisanship by running two regressions (one with party variables and one with donor variables) restricted to just Board

members (whose party identification was independent of the donor data). Then I would be able to see which set of variables matters more for intensity of partisanship.

My variables for career were also loosely defined. The six categories were banking/finance, government, law, consulting, academia/research, and non-financial business. Government was probably the most broad category. I assigned anyone to it who had any involvement in politics or government. If a FOMC member run for state legislature, did political advising for the White House, worked for a legislator, was a member of the Council of Economic Advisors, or did any other related job, he or she was placed in the Government category. Given the general insignificance of the coefficients on these variables, those categories are, apparently, not narrow enough to give interesting, accurate results.

There are also many interesting directions for future work. One direction for future work would be to repeat some of the regressions I did in my second empirical strategy with different versions of the Taylor Rule. Another interesting direction would be to get real time data for the Taylor Rule prescriptions. Real-time data refers to the vintage of data that policymakers would have seen at the time they were making decisions. Because real GDP data are revised, today's estimates for real GDP in, say, 1982, could be quite different from the estimates that would have been available in 1982. Using real-time data would give more accurate results because we would be looking at the same data as the FOMC members were when they were making their decisions about the federal funds rate. However, I did not use real time data because it was only available after 1990, and did not cover my entire dataset. I intend to try this in future research. I also could have tried multinomial probit rather than multinomial logit to see if my results are sensitive to differences in functional form.

VII. Conclusion

The most interesting and clearest conclusion that FOMC voting behavior is different when a Republican is President than when a Democrat is President. These differences across Administrations are particularly pronounced for decisions to decrease rates though they also seem to play a role in decisions to increase rates (though not as strongly). I had expected to find that Republican FOMC members are more hawkish than Democratic FOMC members, but I did not find that as a consistent pattern.

I also found that once I controlled for the state of the economy via my Taylor Rule mechanism, the effect of the BankPresident was insignificant, compared to my first empirical strategy (in which I did not control for the state of the economy) where BankPresident was one of the few variables that was consistently significant. I had found in my first set of regressions in Table 3 that bank presidents were more likely to cast a dissent vote for tighter monetary policy, and less likely to cast a dissent for looser policy, than Board members. I had modeled my regression on the prior literature, using dissent votes as my dependent variable. This literature consistently found that bank presidents were more hawkish than Board members. I found that once I controlled for the state of the economy, it was Republicans, not bank presidents, who were hawkish.

More generally, I found that controlling for the state of the economy was very important. Before doing this, as in my first empirical strategy, I had results that were often not significant and difficult to interpret. Controlling for the effect of economic conditions on interest rate decisions also undid the significance of some results (like the difference for Bank Presidents) that have appeared in prior research.

The political independence of the Federal Reserve is back in the news with President Trump's attacks on the Fed. I did not find direct evidence of partisanship in the sense of Republicans and Democrats voting differently, but I did find evidence that FOMC voting patterns are different depending on the party of the President. These results call for further digging to identify exactly what it is about the time periods of Republican Administrations that generate these differences in FOMC voting behavior.

8. Tables and Figures

Figure 1: Federal Funds Rate, Taylor Rule, and Yellen Rule Graph (1970 - 2018)

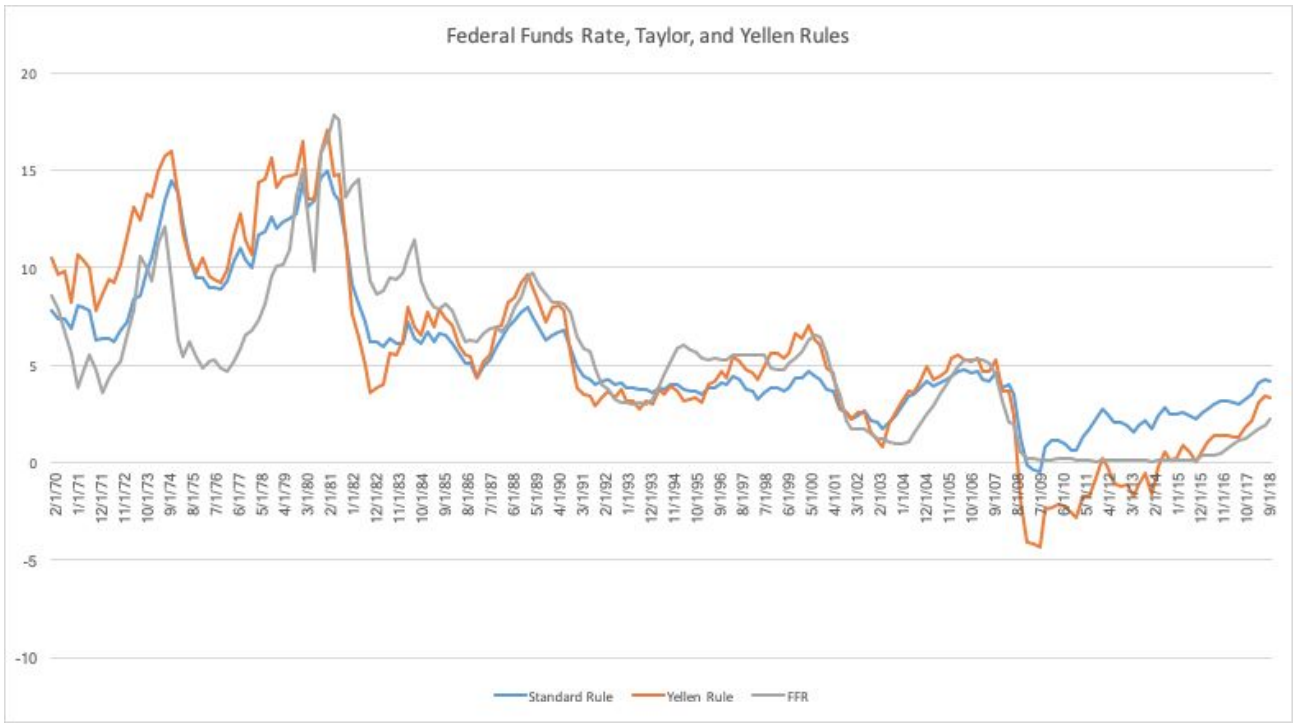

Table 1: Summary Statistics

Variable Name	Obs	Mean	Std. Dev	Min	Max
Dissent	5077	0.066	0.249	0	1
LooserDissent	5077	0.019	0.138	0	1
TighterDissent	5077	0.041	0.198	0	1
OtherDissent	5077	0.006	0.078	0	1
Chair	5077	0.091	0.288	0	1
BankPresident	5077	0 .448	0.497	0	1
BoardMember	5077	0.455	0.498	0	1
AlternateMember	5077	0.006	0.075	0	1
Male	5077	0.885	0.319	0	1
Female	5077	0.115	0.319	0	1
White	5077	0.955	0.208	0	1
Black	5077	0.041	0.198	0	1
Asian	5077	0.002	0.040	0	1
Other	5077	0.003	0.056	0	1
BankingFinance	5077	0.382	0.486	0	1
Government	5077	0.427	0.495	0	1
Law	5077	0.075	0.263	0	1
Consulting	5077	0.062	0.241	0	1
AcademiaResearch	5077	0.509	0.500	0	1
NonFinancialBusiness	5077	0.030	0.170	0	1
PhD	5077	0.583	0.493	0	1
MBA	5077	0.164	0.370	0	1

LawEd	5077	0.118	0.322	0	1
OtherDegrees	5077	0.183	0.387	0	1
Republican	5077	0.460	0.498	0	1
Democrat	5077	0.338	0.473	0	1
Independent	5077	0.012	0.109	0	1
Unidentifiable	5077	0.190	0.392	0	1
Donation	5077	0.478	0.500	0	1
NoDonation	5077	0.522	0.500	0	1
RepublicanDonor	5077	0.222	0.416	0	1
DemocratDonor	5077	0.247	0.432	0	1
MixedDonor	5077	0.008	0.091	0	1
RepublicanPresident	5077	0.593	0.491	0	1
DemocratPresident	5077	0.407	0.491	0	1
DegreeYear	4906	1962.496	15.698	1929	2002
BirthYear	5077	1934.370	15.368	1904	1973

Table 2: Transformation of Existing Data into Vote Unchanged, Vote Increase, Vote Decrease Index

FFRTargetChange[23]	TighterDissent	LooserDissent	Index = 1	Index = 2	Index = 3
1	no	no		✔	
1	yes	no		✔	
1	no	yes	✔		
0	no	no	✔		
0	yes	no		✔	
0	no	yes			✔
-1	no	no			✔
-1	yes	no	✔		
-1	no	yes			✔

[23] A one in this column indicates that the FOMC voted to increase the rate, relative to the previous meeting. A zero indicates that the FOMC voted to keep the rate the same, relative to the previous meeting. A negative one indicates that the FOMC voted to decrease the rate, relative to the previous meeting.

Table 3: Basic Dissent Regressions: Correlation Between Background Characteristics and the Probability of Dissent Voting

Variable	Coefficient for Dissent Regression	Coefficient for LooserDissent Regression	Coefficient for TighterDissent Regression
Bank President	0.057** (5.63)	-0.014** (-2.48)	0.061** (7.79)
BankingFinance	-0.006 (-0.65)	0.005 (0.89)	-0.013* (-1.78)
Law	-0.017 (-0.70)	-0.011 (-0.86)	-0.003 (-0.18)
Consulting	0.007 (0.40)	-0.003 (-0.31)	0.013 (0.93)
AcademiaResearch	0.036** (3.68)	0.004 (0.66)	0.026** (3.42)
NonFinancialBusiness	-0.008 (-0.33)	0.002 (0.15)	-0.013 (-0.66)
PhD	-0.001 (-0.05)	-0.009 (-1.26)	0.010 (0.95)
MBA	0.006 (0.48)	-0.009 (-1.23)	0.002 (0.23)
LawEd	0.005 (0.23)	-0.007 (-0.64)	0.012 (0.75)
Male	-0.046** (-3.53)	-0.045** (-6.27)	-0.004 (-0.41)
Black	0.012 (0.50)	0.021 (1.60)	-0.009 (-0.51)
Asian	0.365** (3.91)	0.383** (7.32)	-0.017 (-0.23)
MixedRace	0.187** (2.85)	0.113** (3.07)	0.059 (1.15)

RepublicanPresident	0.034 (0.62)	-0.013 (-0.42)	0.045 (1.07)
Republican	0.032** (3.02)	0.014** (2.42)	0.027** (3.25)
Independent	0.192** (5.44)	0.026 (1.33)	0.184** (6.63)
Unidentifiable	0.009 (0.71)	0.015** (1.98)	0.001 (0.13)
ThirtiesDegree	0.036 (1.46)	-0.022 (-1.59)	0.047** (2.45)
FortiesDegree	0.041 (1.71)	-0.020 (-1.49)	0.054 (2.87)
FiftiesDegree	0.031 (1.56)	0.000 (0.02)	0.024 (1.55)
SixtiesDegree	0.055** (2.78)	0.017 (1.58)	0.031** (2.01)
SeventiesDegree	0.003 (0.17)	0.005 (0.45)	-0.011 (-0.81)
EightiesDegree	0.029 (1.47)	0.019* (1.72)	0.004 (0.25)

Table 4a: Impact of Political Affiliation on FOMC Voting Behavior After Controlling for the State of the Economy (VoteIncrease)

Variable	Yellen Coefficient	Yellen dy/dx	Standard Coefficient	Standard dy/dx
RuleMinusRate	.103** (2.91)	.014** (2.40)	-.110** (-2.50)	-.023** (-3.19)
Rule1980t2008	.231** (5.41)	.058** (7.26)	.360** (7.91)	.085** (10.43)
Rule2008t2018	.637** (2.68)	.124** (3.17)	-.695** (4.02)	-.082** (-2.59)
YellenRepublican	.007 (.17)	.001 (0.09)	-.025 (-.62)	-.004 (-.58)
YellenRepublicanPres	-.109** (-2.81)	-.023** (-3.36)	.014 (.35)	-.004 (-.056)
BankPresident	.143 (1.16)	.027 (1.31)	.154 (1.17)	.029 (1.31)
Republican	.386* (1.92)	.000 (.00)	.221 (1.13)	-.033 (-.97)
Republican w/Democratic Pres	-.425** (2.54)	.007 (.24)	-.191 (-1.02)	.046 (1.43)
Democrat w/Republican Pres	.693** (3.27)	.053 (1.50)	.497** (2.14)	.014 (.34)
Not Democrat or Republican	.281 (1.10)	.046 (1.04)	.279 (1.02)	.046 (.93)
Not Democrat or Republican w/Republican Pres	.162 (.72)	-.039 (-.96)	-.050 (-.23)	-.081** (-1.96)

Note: t-stats in parentheses. All specifications include a constant, a time trend, the time trend squared, and the time trend cubed.

Table 4b: Impact of Political Affiliation on FOMC Voting Behavior After Controlling for the State of the Economy (VoteDecrease)

Variable	Yellen Coefficient	Yellen dy/dx	Standard Coefficient	Standard dy/dx
RuleMinusRate	.092 (1.16)	.008 (.81)	.130** (2.40)	.019** (3.07)
Rule1980t2008	-.554** (-4.86)	-.075** (-5.94)	-.684** (-7.49)	-.095** (-9.45)
Rule2008t2018	-.505** (-3.50)	-.083** (4.78)	-1.060** (-2.22)	-.104* (-1.84)
YellenRepublican	.014 (.54)	.002 (.39)	-.005 (-.19)	.000 (.05)
YellenRepublicanPres	.137** (2.98)	.020** (3.54)	.175** (4.68)	.021** (4.82)
BankPresident	-.089 (-.77)	-.016 (1.11)	-.087 (-.88)	-.016 (-1.29)
Republican	1.917** (7.33)	.219** (7.39)	2.076** (7.99)	.243** (7.77)
Republican w/Democratic Pres	-2.320** (-8.69)	-.266** (-8.77)	-2.292** (-9.69)	-.270** (-9.58)
Democrat w/Republican Pres	1.884** (6.70)	.204** (6.41)	2.073** (7.59)	.233** (7.24)
Not Democrat or Republican	.364 (0.10)	-.005 (-.11)	.050 (.14)	-.004 (-.08)
Not Democrat or Republican w/Republican Pres	1.945** (6.16)	.230** (5.99)	2.105** (6.54)	.256** (6.58)

Note: t-stats in parentheses. All specifications include a constant, a time trend, the time trend squared, and the time trend cubed.

Table 5a: Impact of Gender on FOMC Voting Behavior After Controlling for the State of the Economy (VoteIncrease)

Variable	Yellen Coefficient	Yellen dy/dx	Standard Coefficient	Standard dy/dx
RuleMinusRate	.103** (2.91)	.014** (2.40)	-.110 (-2.50)	-.023** (-3.21)
Rule1980t2008	.231** (5.41)	.058** (7.26)	.360** (7.92)	.085** (10.44)
Rule2008t2018	.637** (2.68)	.124** (3.17)	-.695** (-4.03)	-.082** (-2.58)
YellenRepublican	.006 (.17)	.001 (.09)	-.025 (-.63)	-.004 (-.58)
YellenRepublicanPres	-.109** (-2.82)	-.023** (-3.37)	.014 (.35)	-.004 (-.56)
BankPresident	.144 (1.18)	.027 (1.33)	.151 (1.15)	.029 (1.30)
Republican	.387* (1.90)	-.000 (-.01)	.215 (1.06)	-.035 (-.98)
Republican w/Democratic Pres	-.425** (-2.54)	.007 (.25)	-.191 (-1.02)	.046 (1.43)
Democrat w/Republican Pres	.694** (3.27)	.053 (1.49)	.494** (2.12)	.013 (.32)
Not Democrat or Republican	.282 (1.06)	.045 (1.00)	.273 (.95)	.044 (.85)
Not Democrat or Republican w/Republican Pres	.162 (.72)	-.038 (-.96)	-.049 (-.22)	-.080 (-1.95)
Male	-.008 (-.04)	.001 (.04)	.038 (.18)	.011 (.30)

Note: t-stats in parentheses. All specifications include a constant, a time trend, the time trend squared, and the time trend cubed.

Table 5b: Impact of Gender on FOMC Voting Behavior After Controlling for the State of the Economy (VoteDecrease)

Variable	Yellen Coefficient	Yellen dy/dx	Standard Coefficient	Standard dy/dx
RuleMinusRate	.093 (1.17)	.008 (.83)	.132** (2.43)	.020** (3.10)
Rule1980t2008	-.555** (-4.87)	-.075** (-5.95)	-.686** (-7.51)	-.095** (-9.44)
Rule2008t2018	-.505** (-3.50)	-.083** (-4.78)	-1.066** (-2.22)	-.105* (-1.85)
YellenRepublican	.014 (.53)	.002 (.38)	-.006 (-.22)	.000 (.03)
YellenRepublicanPres	.137** (2.96)	.020** (3.52)	.175** (4.68)	.021** (4.82)
BankPresident	-.086 (-.75)	-.015 (-1.10)	-.085 (-.87)	-.015 (-1.29)
Republican	1.929** (7.36)	.220** (7.32)	2.097** (8.09)	.245** (7.77)
Republican w/Democratic Pres	-2.322** (-8.60)	-.266** -8.67)	-2.295** (-9.56)	-.270 (-9.47)
Democrat w/Republican Pres	1.891** (6.78)	.205** (6.46)	2.082** (7.72)	.234** (7.35)
Not Democrat or Republican	.056 (.15)	-.003 (-.06)	0.84 (.23)	.001 (.002)
Not Democrat or Republican w/Republican Pres	1.941** (6.15)	.229** (5.98)	2.102** (6.53)	.255 (6.57)
Male	-.077 (-.30)	-.009 (-.28)	-.143 (-.62)	-.018 (-.62)

Note: t-stats in parentheses. All specifications include a constant, a time trend, the time trend squared, and the time trend cubed.

Table 6a: Impact of Educational Attainment on FOMC Voting Behavior After Controlling for the State of the Economy (VoteIncrease)

Variable	Yellen Coefficient	Yellen dy/dx	Standard Coefficient	Standard dy/dx
RuleMinusRate	.103** (2.90)	.014** (2.37)	-.110** (-2.49)	-.023** (-3.18)
Rule1980t2008	.232** (5.38)	.058** (7.21)	.360** (7.89)	.085** (10.40)
Rule2008t2018	.634** (2.68)	.123** (3.18)	-.695** (-4.00)	-.082** (-2.59)
YellenRepublican	.008 (.20)	.001 (.12)	-.024 (-.61)	-.004 (-.56)
YellenRepublicanPres	-.110** (-2.80)	-.023** (-3.35)	.013 (.34)	-.004 (-.57)
BankPresident	.164 (1.24)	.030 (1.36)	.176 (1.25)	.032 (1.38)
Republican	.394* (1.92)	.001 (.04)	.229 (1.15)	-.032 (-.92)
Republican w/Democratic Pres	-.414** (-2.43)	.009 (.31)	-.177 (-.94)	.049 (1.48)
Democrat w/Republican Pres	.703 (3.32)	.054 (1.55)	.506** (2.17)	.015 (.38)
Not Democrat or Republican	.271 (.97)	.044 (.93)	.263 (.87)	.043 (.81)
Not Dem or Republican w/Republican Pres	.156 (.69)	-.039 (-.98)	-.057 (-.26)	-.082** (-1.99)
PhD	.036 (.29)	.006 (.28)	.050 (.37)	.009 (.37)
MBA	-.050 (-.34)	-.010 (.43)	-.067 (-.47)	-.013 (-.55)
LawEd	.095 (.70)	.013 (.63)	.083 (.48)	.013 (.450

Note: t-stats in parentheses. All specifications include a constant, a time trend, the time trend squared, and the time trend cubed.

Table 6b: Impact of Educational Attainment on FOMC Voting Behavior After Controlling for the State of the Economy (VoteDecrease)

Variable	Yellen Coefficient	Yellen dy/dx	Standard Coefficient	Standard dy/dx
RuleMinusRate	.094 (1.17)	.008 (.84)	.132** (2.42)	.019** (3.08)
Rule1980t2008	-.557** (-4.86)	-.075** (-5.94)	-.685** (-7.49)	-.095 (-9.45)
Rule2008t2018	-.505** (-3.50)	-.082** (-4.78)	-1.062** (-2.22)	-.104* (-1.84)
YellenRepublican	.014 (.50)	.001 (.34)	-.006 (-.20)	.000 (.03)
YellenRepublicanPres	.134** (3.01)	.020** (3.57)	.174** (4.68)	.021** (4.81)
BankPresident	-.084 (-.71)	-.016 (-1.07)	-.088 (-.85)	-.107 (-1.28)
Republican	1.919** (7.18)	.219 (7.22)	2.075** (7.83)	.242** (7.61)
Republican w/Democratic Pres	-2.324** (-8.66)	-.267** (-8.71)	-2.297** (-9.57)	-.271** (-9.42)
Democrat w/Republican Pres	1.887** (6.72)	.204** (6.43)	2.071** (7.61)	.232** (7.25)
Not Democrat or Republican	.033 (.09)	-.005 (-.11)	.046 (.12)	-.003 (-.07)
Not Dem or Republican w/Republican Pres	1.942** (6.20)	.229** (6.03)	2.109 (6.59)	.256** (6.64)
PhD	.004 (.04)	-.001 (-.05)	-.005 (-.05)	-.002 (-.16)
MBA	.055 (.35)	.008 (.46)	.055 (.37)	.009 (.50)
LawEd	.088 (.55)	.007 (.43)	.038 (.23)	.002 (.09)

Note: t-stats in parentheses. All specifications include a constant, a time trend, the time trend squared, and the time trend cubed.

*Table 7a: **Impact of Donor Partisanship on FOMC Voting Behavior While Controlling for the State of the Economy (VoteIncrease)***

Variable	Yellen Coefficient	Yellen dy/dx	Standard Coefficient	Standard dy/dx
RuleMinusRate	.081** (2.17)	.011* (1.76)	-.147** (-3.42)	-.029** (-4.05)
Rule1980t2008	.237** (5.43)	.058** (7.50)	.377** (8.43)	.087** (11.18)
Rule2008t2018	.640** (2.68)	.123** (3.16)	-.619** (-3.60)	-.069** (-2.25)
YellenRepublicanDonor	.049 (1.10)	.008 (1.07)	.052 (1.09)	.008 (1.14)
YellenRepublicanPres	-.096** (-2.35)	-.021** (2.97)	.015 (.38)	-.004 (-.54)
BankPresident	.196** (2.07)	.035** (2.21)	.209** (2.13)	.037 (2.25)
RepublicanDonor	.343 (1.60)	-.008 (-.23)	.191 (.85)	-.040 (-1.02)
Republican Donor w/Democratic Pres	-.524** (-2.12)	.002 (.06)	-.422 (-1.60)	.013 (.30)
Democrat Donor w/Republican President	.859** (3.83)	.078** (2.16)	.660** (2.52)	.041 (.94)
Mixed Donor	1.016** (5.53)	.151** (4.95)	1.064** (4.61)	.157** (4.13)
No Donations	.276 (1.35)	.044 (1.31)	.321 (1.40)	.054 (1.35)
Non Donor w/Republican President	.203 (1.28)	-.033 (-1.19)	-.019 (-.12)	-.076** (-2.67)

Note: t-stats in parentheses. All specifications include a constant, a time trend, the time trend squared, and the time trend cubed.

Table 7b: Impact of Donor Partisanship on FOMC Voting Behavior While Controlling for the State of the Economy (VoteDecrease)

Variable	Yellen Coefficient	Yellen dy/dx	Standard Coefficient	Standard dy/dx
RuleMinusRate	.086 (1.13)	.007 (.87)	.119** (2.30)	.019** (3.17)
Rule1980t2008	-.556** (-5.00)	-.075** (-6.23)	-.679** (-7.65)	-.094** (-9.90)
Rule2008t2018	-.493** (-3.44)	-.081** (-4.73)	-1.057** (-2.26)	-.106* (-1.93)
YellenRepublicanDonor	-.001 (-.04)	-.002 (-.40)	-.005 (-.14)	-.002 (-.56)
YellenRepublicanPres	.152** (3.26)	.022** (3.67)	.180** (4.81)	.021** (4.94)
BankPresident	-.061 (-.66)	-.014 (-1.25)	-.061 (-.70)	-.014 (-1.36)
RepublicanDonor	1.967** (6.90)	.225** (7.04)	2.138** (7.72)	.250** (7.60)
Republican Donor w/Democratic Pres	-2.692** (-7.13)	-.307** (-6.80)	-2.51** (-8.00)	-.287** (-7.66)
Democrat Donor w/Republican President	1.965** (6.55)	.208** (6.20)	2.097** (7.19)	.230** (6.83)
Mixed Donor	.576** (2.34)	.035 (1.21)	.683** (2.86)	.046 (1.58)
Non Donation	.051 (.17)	-.003 (-.09)	.020 (.08)	-.008 (-.27)
Non Donor w/Republican President	1.997** (8.52)	.234** (8.90)	2.146** (9.19)	.258** (9.61)

Note: t-stats in parentheses. All specifications include a constant, a time trend, the time trend squared, and the time trend cubed.

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