Nijmegen School of Management
Department of Economics and Business Economics
Master's Thesis in Economics (MAN-MTHEC)

Independent but Not Completely Unbiased: How the Fed's Monetary Policy Reacts to Political Budget Cycles

By Marlon Wijnen (s1004646)

Nijmegen, 30 June 2023

Programme: Master's Programme in Economics
Specialisation: Financial Economics
Supervisor: Dr. Frank Bohn

Radboud Universiteit

Abstract

In this paper, it is investigated how the Federal Reserve's monetary policy reacts to opportunistic political budget cycles caused by both gubernatorial and presidential elections in the United States between 1960 and 2008. The effect of a similar or different political affiliation of the incumbent and the Fed chairman on the Federal Funds Rate was analysed. It was found that the Federal Reserve reacts independently to gubernatorial elections but is not politically unbiased. The Federal Funds Rate was increased in the case of a different political affiliation and not in the case of a similar political affiliation, meaning that the re-election chances of incumbent state governors with a different political affiliation were decreased and those of incumbent state governors with a similar political affiliation were not. This effect was mainly driven by states with the largest population. Moreover, there was weak evidence that the Fed decreases the Federal Funds Rate before presidential elections, independent of the political affiliation of the incumbent president, increasing his/her re-election chances. However, this result was too weak and too close to the Taylor rule to conclude that the Fed reacts non-independently to presidential elections.

Table of Contents

1 Introduction

Motivated by the importance of an independent central bank, this paper investigates how the Federal Reserve's (Fed) monetary policy reacts to opportunistic political budget cycles (PBC) caused by gubernatorial and presidential elections.

An opportunistic PBC means that a government increases its fiscal spending before an election in order to make voters believe that the economy is doing well (Philips, 2016). The purpose of this is to get re-elected. There is evidence that opportunistic PBCs are present when there are presidential elections (Chang, Kim, & Ying, 2009; Grier, 1987; Milani, 2010; Philips, 2016; Shi & Svensson, 2006) and when there are gubernatorial elections (Berry & Berry, 1994; Besley & Case, 1995; Boylan, 2008; Chang et al., 2009) in the United States (U.S.).

An effect of an opportunistic PBC is that inflation increases (Alesina & Roubini, 1992). The central bank should in this case adjust its monetary policy by increasing the interest rate to offset the effect of the increased fiscal spending. An independent central bank would do so without allowing influence of incumbents (Calomiris, 2019). However, when a central bank is non-independent, it may be prone to short-term political pressure. It can be beneficial for the re-election chances of an incumbent to prevent an interest rate increase so that the expansionary effect of the opportunistic PBC is not offset by the central bank.

There is indeed evidence against completely independent monetary policy by the Fed (Smith & Boettke, 2015). The Fed is influenced by short-term political pressure in its monetary policy decisions instead of only focusing on what is best for the long term. For instance, a central banker from the Fed may want to support the president and therefore monetary policy in the U.S. can become the weighted average of the Fed's and the government's preferences (Clark & Arel-Bundock, 2013). Since opportunistic PBCs are also present on an individual state level, it is possible that the Fed does not show completely independent monetary policy behaviour around gubernatorial elections either. All this begs the question: how does the Federal Reserve's monetary policy react to opportunistic PBCs caused by gubernatorial and presidential elections?

This paper investigates how the Fed adapts its monetary policy to opportunistic PBCs caused by gubernatorial and presidential elections. It is analysed whether this monetary policy adaptation is different in a situation where the Fed chairman and the incumbent state governor or president have a similar political affiliation than in the situation where they have a different political affiliation.

This analysis is performed using weighted least squares regressions of time series with yearly data from 1960 to 2008. Data for all 50 individual states and the U.S. are retrieved from the Federal Reserve Economic Database. The Fed's monetary policy reaction is represented by the Federal Funds Rate. To examine the impact of gubernatorial elections on the Federal Funds Rate, the measures $ESameParty_t$ and $EDiffParty_t$ are created, representing the weighted share of incumbent state governors with an election in the following year with a similar or different political affiliation than the Fed chairman.

Findings indicate that the Fed reacts independent to gubernatorial elections but not politically unbiased. The Federal Funds Rate was increased in the case of a different political affiliation of the weighted share of incumbent state governors and the Fed chairman and not in the case of a similar political affiliation. This means that the re-election chances of incumbent state governors with a different political affiliation were decreased and those of incumbent state governors with a similar political affiliation were not. This effect was mainly driven by large states in terms of population. Moreover, there was weak evidence that the Fed decreases the Federal Funds Rate before presidential elections, independent of the political affiliation of the incumbent president, increasing his/her re-election chances. However, this result was too weak and too close to the Taylor rule to conclude that the Fed reacts non-independently to presidential elections.

This paper contributes to the literature that the Fed's monetary policy reaction to opportunistic PBCs caused by gubernatorial elections is investigated, which is a not yet extensively investigated topic. There is literature about the Fed's monetary policy reaction to presidential elections, for instance by Dentler (2019), but there are not yet a lot of papers about the Fed's monetary policy reaction to gubernatorial elections. Moreover, this topic is relevant because central bank independence is important for a well-functioning economy.

The remainder of this paper is organised as follows. Section 2 reviews the literature as well as the hypotheses. Section 3 explains the data and methodology. Section 4 shows the empirical results. Section 5 offers the discussion. Lastly, section 6 gives the concluding remarks.

2 Literature Review

2.1 PBCs

There are opportunistic and partisan PBCs. An opportunistic PBC means that a government increases its fiscal spending before an election in order to make voters believe that the economy is doing well (Philips, 2016). The purpose of this is to get re-elected. On the other hand, a partisan PBC means that fiscal policy is influenced by the political ideology of the incumbent. The partisan PBC is also observable after the elections, whereas an opportunistic PBC is observable before the elections. For partisan PBCs, see Hibbs (1977). This paper focuses on the opportunistic PBC.

An important distinction to make is the distinction between political business cycles and opportunistic political budget cycles (PBC). The political business cycle is about stimulation of the economy and monetary policy is used for this purpose. This macro-economic purpose coincides with the electoral cycle and uses the Philips curve, meaning that the economy is stimulated via inflation and unemployment around an election. By increasing the money supply before an election, for instance, the incumbent can boost the economy by decreasing unemployment. Important models of the political business cycle are created by Nordhaus (1975) and MacRae (1977).

On the other hand, an opportunistic PBC focuses on fiscal stimulation of the economy. An opportunistic PBC does not only have the purpose of stimulating the economy, but it can also have the purpose of creating higher re-election chances for the incumbent. Important models of the opportunistic PBC are created by Rogoff (1987) and Rogoff (1990).

According to the PBC model by Rogoff (1990), the decisions that voters make for an election candidate should only be based on which incumbent they expect to give them the highest welfare after the election. In this model, incumbents have a certain competence level, which reflects their ability to provide more public goods for a given level of taxes. The incumbent has an incentive to increase fiscal spending before an election for re-election purposes and not to invest this money in public goods. This leads to information asymmetry because the voters do not know the incumbent's competence, whereas the incumbent does know whether he/she uses the public money wisely (for re-election purposes or investment for public goods). It is this information asymmetry that leads to an opportunistic PBC because the incumbent can increase public spending before an election for re-election purposes without the voters knowing that this money is not invested in public goods. This makes voters believe the economy is doing well, not knowing yet that the post-election welfare, which would be increased by investment in public goods before the election, will not be increased by the incumbent's behaviour. As will be discussed in the next sections, evidence that opportunistic PBCs occur in the U.S. is present.

2.1.1 Opportunistic PBCs before presidential elections

Several papers find evidence in favour of the existence of opportunistic PBCs around presidential elections in the U.S. Shi and Svensson (2006), for instance, found evidence in favour of opportunistic PBCs around presidential elections. They analysed a panel dataset in which the U.S. was included and found that in election years, the government deficit increases by almost 1% of GDP. However, by making a distinction between developing and developed countries, they found that the results were more robust for developing countries than for developed countries. Therefore, the results for the U.S. may be less strong than the 1% of GDP government deficit increase. In addition, Chang, Kim, and Ying (2009) and Milani (2010) found evidence that fiscal policy is more expansionary before presidential elections in the U.S. Furthermore, by performing a meta-analysis of 88 studies that were published between 2000 and 2015, Philips (2016) finds evidence in favour of the existence of PBCs as well. However, it is important to note that the evidence was small. Moreover, the study also considered both partisan and opportunistic PBCs instead of only opportunistic ones and it did not only focus on the U.S. but also on other countries. In addition, as indicated by Alesina et al. (1993), incumbents at least attempt to avoid tight fiscal policy in election years and sometimes they even implement expansionary fiscal policy.

However, Golden and Poterba (1980) found no significant effects of elections on fiscal spending. They found that the president has to fiscally spend a substantial amount in order to get a relatively small number of extra votes, implying that increased fiscal spending would not incentivise voters heavily to vote for the incumbent.

2.1.2 Opportunistic PBCs before gubernatorial elections

There is also evidence that opportunistic PBCs are present on a state level. This means that incumbent governors of individual states increase their fiscal spending in order to have a higher re-election chance during the upcoming gubernatorial elections. For instance, budget deficits in individual states are $27 per capita higher in a gubernatorial election year. These budget deficits are then paid for by fiscal contraction after the election (Boylan, 2008). Moreover, by investigating tax changes before gubernatorial elections in the U.S., Besley and Case (1995) show that re-election of governors is more likely if they increase their taxes less than their neighbouring states. In addition, states in the U.S. are most likely to increase their taxes when the next election is as far away as possible (Berry & Berry, 1994). Moreover, Chang et al. (2009) also found evidence for the existence of expansionary fiscal policy in election years in states in the U.S., in addition to their similar finding for presidential elections. Focusing on research outside the U.S., Portuguese municipalities receive more subsidies from the national government in years when there are local elections (Veiga, 2012). Moreover, in Portuguese municipalities, opportunistic PBCs increase the re-election probability of the incumbent (Aidt, Veiga, & Veiga, 2011; Veiga & Veiga, 2007). When the incumbents' winning margin is then expected to be higher or when more voters are uninformed, the amount of extra fiscal spending decreases (Bohn & Veiga, 2021). Furthermore, in Colombian municipalities, fiscal spending specifically focused on increasing support for the incumbent is increased before local elections (Drazen & Eslava, 2010). In addition, as found by Jones, Sanguinetti, and Tommasi (2000), in Argentinian provinces, the incumbent governors increase fiscal spending before a gubernatorial election. Moreover, when the incumbent governor has the same political affiliation as the Argentinian president, the governor generally spends less fiscally than provinces that have an incumbent governor with a different political affiliation than the Argentinian president. This indicates that the opportunistic PBC may be supported by the president or central bank (on which the president may have influence).

However, by analysing U.S. gubernatorial elections, Kim and Kwon (2015) show that opportunistic PBCs are not successful. The increased fiscal spending does not affect the re-election chances of the incumbent state governor. Moreover, Bee and Moulton (2015) investigated U.S. municipalities and found no significant change in spending or taxes around elections. However, they did find that there was some, but not significant, increase in spending on municipal affairs such as municipal employment and education.

2.2 Monetary policy response to opportunistic PBCs

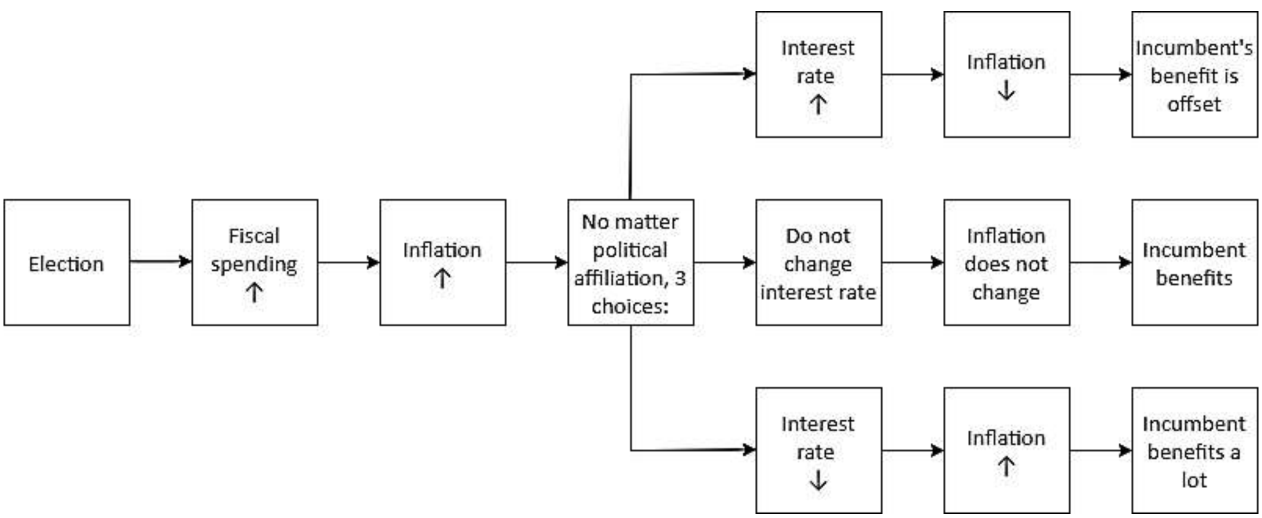
As discussed in Section 2.1, there is evidence in favour of the existence of increased fiscal spending before elections. In this section, it is discussed how the Fed can respond to this. The Fed can react independently of political influence or non-independent of political influence. If the Fed is independent, it can choose to support the incumbent or not. If the Fed is non-independent, it is influenced by the incumbent government and it will always support the incumbent.

Fed independence is needed because it restricts the impact that a president or governor can have on monetary policy. According to Clark and Arel-Bundock (2013), central bank independence diminishes the effect that elections have on interest rates. As was found by Haga (2015), PBCs are smaller when the central banks are de facto independent. So central bank independence generally discourages elected officials to create a PBC.

However, as explained by Calomiris (2019), presidents, governors, or other elected officials show two types of behaviour that can be harmful to economic policy. The first type of behaviour is myopia, which means that they focus on the short-term. They want to get re-elected and therefore they give up their long-term objectives. The second type of behaviour is logrolling, which means that politicians support each other by exchanging favours. The consequence of this is that the incumbent does not prioritize its citizens so choices that benefit everyone will not be made. It is therefore the task of the Fed to create independent monetary policy as a reaction to this myopic behaviour and logrolling by incumbents.

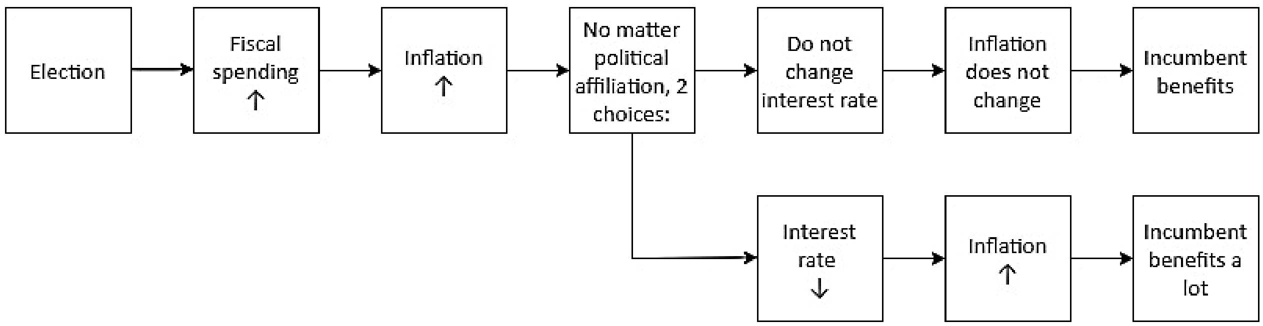
An effect of an opportunistic PBC is that inflation increases (Alesina & Roubini, 1992). In the short run, this increased fiscal spending boosts the economy, which is beneficial for the re-election chances of the incumbent party or politician. However, to meet the inflation and unemployment target, the Fed needs to reduce the inflation caused by opportunistic PBCs. The Fed should in this case adjust its monetary policy by increasing the interest rate to decrease inflation. If they do so, the benefit of increased fiscal spending of the incumbent is offset, which reduces their re-election chances. An independent central bank makes its own choices, meaning that it can choose to support the incumbent or not. Therefore, when there is an election that causes an opportunistic PBC, the Fed has three choices. It can increase the interest rate to offset increased fiscal spending and decrease the re-election chances of the incumbent. It can also be passive, meaning that it does not change the interest rate. In this case, the increased fiscal spending is not offset, with the consequence that the incumbent benefits from the economic boost which increases his/her re-election chances. Lastly, it can choose to decrease the interest rate. In this case, the opportunistic PBC is actively supported, increasing the re-election chances of the incumbent even more than when the central bank is passive. This mechanism of an independent central bank is shown in Figure 1.

Figure 1: Mechanism with independent central bank



However, if the central bank is non-independent, it is controlled by the government, meaning that it will support the incumbent. This means that if there is an election which causes an opportunistic PBC, the government has two choices now. It can choose to be passive, meaning it does not change the interest rate. In this case the incumbent benefits from the increased fiscal spending which increases his/her re-election chances. The other choice is to decrease the interest rate. In this case the opportunistic PBC is actively supported, increasing the re-election chances of the incumbent even more than when the government is passive. The option that an independent central bank has to increase the interest rate to offset the benefit of the incumbent, as shown in Figure 1, is not available anymore since the incumbent controls the central bank's choices. This mechanism of a non-independent central bank is shown in Figure 2.

Figure 2: Mechanism with non-independent central bank



2.3 Does the Fed prevent the opportunistic PBC?

In 1951, the Fed officially became independent. The U.S. Treasury Department and the Fed reached the Treasury-Fed Accord, which meant that the U.S. Treasury was no longer in control of the interest rates. It was now the Fed that was in charge of monetary policy. Because of this agreement, the Fed and its monetary policy became less politically influenced de jure. However, de jure independence does not mean that the Fed is also independent de facto. The literature in this section discusses whether the Fed reacts according to Figure 1 (independent) or Figure 2 (non-independent). The literature also discusses political business cycles. Since the Fed's monetary policy reaction is investigated in this paper and the political business cycles are about monetary policy in the context of elections, these papers are also applicable in this section.

Several papers investigated the Fed's monetary policy reaction to opportunistic PBCs and found that the Fed does not support any opportunistic PBCs, meaning that the Fed reacts independently. For instance, Beck (1984) did not find evidence in favour of the opportunistic PBC affecting the Fed's monetary policy. Between 1955 and 1982, incumbent presidents were not supported by the Fed to increase their chances of re-election. In addition, Maier (2002) also indicates that the Fed is an independent central bank. By analysing the Fed's monetary policy before elections, no evidence of support for opportunistic PBCs was found because the interest rate was generally increased. Important to note is that it is not specified which elections were analysed (for instance, presidential or gubernatorial). Besides, Canzoneri, Cumbi, and Diba (2002) found that the Fed's monetary policy response to government spending shocks, which also occur before elections, is consistent with the Taylor rule, which could imply that it is not influenced by politics. Another paper that found that the Fed reacted independently is Kuper (2018), who investigated the period in which Greenspan was the chairman of the Fed (1987-2006). There were no election-driven cycles that were supported by the Fed in that period. Moreover, Alesina and Roubini (1992) empirically tested the political business cycle model created by Nordhaus (1975) and found no evidence that this model applies to the U.S. However, their results from data on 18 OECD economies do show that inflation increases right after an election, which is a result of expansionary fiscal and monetary policy before the election caused by the other economies in the dataset. As indicated by Alesina et al. (1993), there is no strong evidence of the existence of opportunistic PBCs in OECD economies, but the not completely robust evidence in their research does indicate that opportunistic PBCs should at least be considered in explaining politicians' behaviour.

However, some papers investigated the Fed's monetary policy reaction to opportunistic PBCs and found that the Fed supports some opportunistic PBCs. This does not necessarily mean that the Fed is non-independent, but it does mean that the Fed is at least not politically unbiased in its decisions either. For instance, Dentler (2019) found that the Federal Funds Rate increased before elections when the incumbent president and the Fed chairman have a different political affiliation, while there was weak evidence that the Federal Funds Rate decreased when the incumbent president and the Fed chairman have the same political affiliation. This means that the benefit of increased fiscal spending for the incumbent president was offset when their political affiliation differed, decreasing the incumbent president's re-election chances, while the benefit of increased fiscal spending was not offset when their political affiliation was the same, increasing the incumbent president's re-election chances. Moreover, Abrams and Iossifov (2006) found that when the incumbent president is from the party that nominated the Fed chairman, the Fed's monetary policy is expansionary before the election. This means that the Federal Funds Rate decreases and the consequence of this is that the economy gets a boost, which increases the re-election chances of the incumbent president. In addition, Clark and Arel-

Bundock (2013) tested the effect of partisan PBCs caused by presidential elections on the Federal Funds Rate. Even though their analysis is about partisan PBCs and this paper focuses on opportunistic PBCs, by some reasoning, it becomes clear that their analysis also has similarities with the opportunistic PBC. Their reasoning starts with Rogoff (1985), who indicates that central banks are usually run by central bankers with more conservative ideas, meaning that they keep inflation at a low rate. Clark and Arel-Bundock (2013) then argue that these central bankers' preferences for low inflation may translate into them having preferences for a Republican president. They indeed find that the Federal Funds Rate decreases before presidential elections when the incumbent president is Republican and that the Federal Funds Rate increases before presidential elections when the incumbent president is Democratic. In this case the incumbent president's benefit of increased fiscal spending before an election is offset when the incumbent president is Democratic, which is not the preference of the Fed. At the same time, the incumbent president's benefit of increased fiscal spending before an election is not offset when the incumbent president is Republican, which is the preference of the Fed. This can therefore also be interpreted as evidence in favour of the Fed's support for the opportunistic PBC. However, it is important to keep in mind that conservative ideas about monetary policy do not always translate into a preference for a Republican president over a Democratic president, which would mean that the just discussed reasoning does not apply to every situation. Besides, Milani (2010) indicates that the Fed is independent because the Fed's monetary policy only changes after presidential elections and not before, meaning that they do not want to interfere with the presidential elections. However, the explanation provided for this result could also indicate that the Fed is non-independent because not increasing the interest rate before an election could mean that the Fed does not want to offset the benefit of increased fiscal spending for the incumbent president, increasing his/her re-election chances. Only after the elections monetary policy is adapted, when the incumbent has had the chance to benefit from the fiscal expansion. Therefore, this behaviour by the Fed could mean that it is non-independent because it always supports the incumbent which reflects that it is controlled by the government. Furthermore, Grier (1987) argues that in the year after an election money growth is reduced, whereas in the three years thereafter money growth is increasing. This indicates that after an election, the interest rate is increased and before the election, the interest rate is reduced. This may mean that the Fed supports the opportunistic PBC. Moreover, Funashima (2016) investigated political business cycles as explained by Nordhaus (1975) and found that the Fed generally decreases the interest rate before the presidential elections, with the only exception being the 1990s. This implies that the incumbent generally receives support from the Fed. However, it is also stated by Funashima (2016) that the Fed's independence relatively improved in the last 3 decades.

Focusing more specifically on macroeconomic expectations around presidential elections in the U.S., Richards (1986) did not find support in favour of the political business cycle by taking into consideration the money growth expectations of voters in the analysis of monetary policy by the Fed. However, by splitting the results into two periods, the results for the period before 1975 indicate that there may have been Fed support for the incumbent and that it disappeared thereafter. It was indicated that, to support the incumbent before an election, the Fed had to increase the money supply by more than voters expected. According to Richards (1986), voters did not consider political influences in their macro-economic expectations before 1975, whereas after 1975 voters became aware of political influences because economists started investigating this topic. The process of considering political influences is confirmed by Suzuki (1992), who shows that before a presidential election, the share of voters that expects a boost of the economy increases. A possible explanation is therefore that after 1975 the Fed may have withdrawn from supporting the incumbent because the monetary policy would have to be too expansionary to be more than what voters expected. What complements this interpretation is the finding by Milani (2010), who found that before 1985 monetary policy was more expansionary than after 1985. This is consistent with the idea that after political influences became part of macroeconomic expectations, the Fed started to implement less expansionary monetary policy.

2.4 Hypotheses

As discussed in the literature in section 2, it is a common finding that governments increase fiscal spending before an election to make voters believe that the economy is doing well

(Philips, 2016). Focusing specifically on the U.S., there is evidence that PBCs are also present on a state level (Berry & Berry, 1994; Besley & Case, 1995; Boylan, 2008). This behaviour increases inflation (Alesina & Roubini, 1992), which has to be offset by the Fed by increasing the interest rates. However, when the Fed does not act completely independent, the interest rate may never be increased in this situation. It is also possible that it is independent, but not completely politically unbiased. In the case of presidential elections, the Federal Funds Rate increased before elections when the incumbent president and the Fed chairman have a different political affiliation, while there was weak evidence that the Federal Funds Rate decreased when the incumbent president and the Fed chairman have the same political affiliation (Dentler, 2019). This leads to a higher re-election chance for an incumbent president with the same political affiliation as the Fed chairman and a lower re-election chance of an incumbent president with a different political affiliation. Because increased fiscal spending before gubernatorial elections is also observed by Berry and Berry (1994), Besley and Case (1995), and Boylan (2008), for the analysis in this paper it is expected that the Fed also has a preference for state governors with the same political affiliation as their chairman. This leads to the following hypotheses:

Hypothesis 1: When the weighted share of incumbent governors with a gubernatorial election next year with the same political affiliation as the Fed chairman is higher, the Federal Funds Rate is expected to stay constant or decrease.

Hypothesis 2: When the weighted share of incumbent governors with a gubernatorial election next year with a different political affiliation than the Fed chairman is higher, the Federal Funds Rate is expected to increase.

However, it is also likely that the Fed does not react completely politically unbiased to presidential elections since there is also literature that found this result (Abrams & Iossifov, 2006; Dentler, 2019; Funashima, 2016). When the incumbent president and the Fed chairman have the same political affiliation it is expected that the re-election chances of the incumbent president are increased by not offsetting or even increasing the benefit of increased fiscal spending for the incumbent president. On the contrary, when the incumbent president and the Fed chairman have a different political affiliation it is expected that the re-election chances of the incumbent president are decreased by offsetting the benefit of increased fiscal spending. This leads to the following hypothesis:

Hypothesis 3: When there is a presidential election in the next year and the incumbent president and the Fed chairman have the same political affiliation, the Federal Funds Rate is expected to be significantly lower than when they have a different political affiliation.

The reason that Hypothesis 1 and 2 are formulated as "the Federal Funds Rate is expected to stay constant or decrease" and "the Federal Funds Rate is expected to increase" and Hypothesis 3 is formulated as "the Federal Funds rate is expected to be significantly lower" is because of the difference in variables that analyse the gubernatorial and presidential elections. For the gubernatorial elections, two measures are created as variables to be able to weigh the different states to account for the difference in impact that a large and a small state have on the Federal Funds Rate. On the other hand, for the presidential election, a dummy variable is used to analyse the effect on the Federal Funds Rate since there is no weighting involved. As a result, it is only possible to conclude that the effect of the dummy is higher or lower in the case of value 1 or 0, whereas the variables for the gubernatorial elections each have a positive or negative impact on the Federal Funds Rate. The measures for gubernatorial and presidential elections will be presented in Section 3.

3 Methodology and data

3.1 Methodology

To perform the analysis in this paper, time series data is used. Yearly data is retrieved from 1960 until 2008.

This paper investigates both the gubernatorial elections and the presidential elections, meaning that it is about the elections in which state governors are elected and elections in which U.S. presidents are elected. Moreover, following Shi and Svensson (2006), the election data will only be about predetermined elections. With predetermined is meant that the election is held on a fixed day that is specified by the constitution. Only predetermined elections are included in the dataset because the purpose of this paper is to find the effect of opportunistic PBCs on monetary policy adaptation around elections. If an election comes unexpectedly, there will likely not be additional fiscal spending beforehand.

The following regressions are performed. They are the same, except for the independent variables $ESameParty_t$ and $EDiffParty_t$:

(1) $\Delta FFR_t = \alpha + \beta_1 \Delta ESameParty_t + \beta_2 PresElection_{t+1} + \beta_3 \Delta ESameParty_t * PresElection_{t+1} + \beta_4 PresFed_t + \beta_5 PresElection_{t+1} * PresFed_t + \beta_6 \Delta FFR_{t-1} + \beta_7 \Delta Inflation_t + \beta_8 \Delta Unemployment_t + \epsilon_t$

(2) $\Delta FFR_t = \alpha + \beta_1 \Delta EDiffParty_t + \beta_2 PresElection_{t+1} + \beta_3 \Delta EDiffParty_t * PresElection_{t+1} + \beta_4 PresFed_t + \beta_5 PresElection_{t+1} * PresFed_t + \beta_6 \Delta FFR_{t-1} + \beta_7 \Delta Inflation_t + \beta_8 \Delta Unemployment_t + \epsilon_t$

The delta sign Δ indicates that the first difference of that particular variable is taken. This is done because these variables were non-stationary, as will also be explained in section 3.3.

FFR_t is the dependent variable. It is the Federal Funds Rate in year t and it reflects the monetary policy of the Fed. The Fed has to increase the Federal Funds Rate before the election to offset the effect of the opportunistic PBC. It is assumed that the Fed sets the Federal Funds Rate one year before a gubernatorial election.

3.1.1 Independent variable $\boldsymbol{ESameParty_t}$

$ESameParty_t$ is the independent variable in Equation 1. It is used to analyse the gubernatorial elections. It captures the effect of states with a gubernatorial election in time $t+1$ that have an incumbent state governor with the same political affiliation as the Fed chairman in time t. The reason that the Fed chairman's political affiliation is analysed is because the Fed chairman's views are highly influential in the monetary policy decisions of the Fed (Beck, 1984). The variable $SameParty_t$ is calculated as follows:

$$(3)\quad ESameParty_{t,chair=R} = \frac{\sum Population\ of\ Republican\ governor\ states\ in\ t\ with\ election\ in\ t{+}1}{Total\ population\ U.S.\ in\ t}$$

$$(4)\quad ESameParty_{t,chair=D} = \frac{\sum Population\ of\ Democratic\ governor\ states\ in\ t\ with\ election\ in\ t{+}1}{Total\ population\ U.S.\ in\ t}$$

First, the states with a gubernatorial election in time $t+1$ are weighted. This is done according to the population of that particular state since a state with a larger population is likely to influence the Fed more than a state with a smaller population.

Second, there are two possibilities for an incumbent state governor and the Fed chairman to have the same political affiliation: either the incumbent state governor is Republican and the Fed chairman is also Republican, or the incumbent state governor is Democratic and the Fed chairman is also Democratic. Assuming that for the investigated effect on the Federal Funds Rate it makes no difference whether the first or the second situation is present, for the variable $SameParty_t$ there are two possible measurements, shown in Equations 3 and 4. Equation 3 is used when the Fed chairman is Republican and Equation 4 is used when the Fed chairman is Democratic. The idea of both Equations 3 and 4 is to find the effect on the Federal Funds Rate of the states with a gubernatorial election next year that have an incumbent governor with the same political affiliation as the Fed chairman.

Third, to also be able to capture the difference in impact on the Federal Funds Rate between years where there are 36 states with a gubernatorial election and years where there are fewer states with a gubernatorial election, the sum of the population of these states is divided by the total population of the U.S. This way, it is captured how influential the elections in time $t+1$ are in the whole U.S., and therefore there is also a proportional effect on the Federal Funds Rate.

Fourth, when focusing on the difference between the two equations, Equation 3 shows the measurement for when the Fed chairman is Republican and Equation 4 shows the measurement for when the Fed chairman is Democratic. The difference between both equations is in the numerator. In Equation 3 the sum of the population of all states with a gubernatorial election in year $t+1$ with a Republican incumbent state governor in year t is divided by the total population of the U.S. in year t. In Equation 4 the sum of the population of all states with a gubernatorial election in year $t+1$ with a Democratic incumbent state governor in year t is divided by the total population of the U.S. in year t. When the Fed chairman or state governor changed in year t, the political affiliation of the Fed chairman or state governor with the longest term in that year is included in the data.

According to this method, the variable $SameParty_t$ can take any value between 0 and 1. A value closer to 0 indicates that a relatively smaller part of the U.S. has a gubernatorial election next year and at the same time has an incumbent state governor with the same political affiliation as the Fed chairman. A value closer to 1 indicates that a relatively larger part of the U.S. has a gubernatorial election next year and at the same time has an incumbent state governor with the same political affiliation as the Fed chairman.

So again, it is assumed that it does not matter for the measured effect of $SameParty_t$ on the Federal Funds Rate whether the Fed chairman is Republican and the incumbent state governor is Republican, or whether the Fed chairman is Democratic and the incumbent state governor is Democratic. The outcomes of the measures in Equations 3 and 4 are therefore values for the same variable. The weighted share of Republican states with an election in year $t+1$ is calculated when the Fed chairman is Republican, and the weighted share of Democratic states with an election in year $t+1$ is calculated when the Fed chairman is Democratic.

3.1.2 Independent variable $\boldsymbol{EDiffParty_t}$

$EDiffParty_t$ is the independent variable in Equation 2. It is used to analysed the gubernatorial elections. It captures the effect of states with a gubernatorial election in time $t+1$ that have an incumbent state governor with another political affiliation than the Fed chairman in time t. The variable $EDiffParty_t$ is calculated in a similar way as the variable $ESameParty_t$. $EDiffParty_t$ is calculated as follows:

(5) $$EDiffParty_{t,chair=R} = \frac{\sum Population\ of\ Democratic\ governor\ states\ in\ t\ with\ election\ in\ t{+}1}{Total\ U.S.\ population\ in\ t}$$

(6) $$EDiffParty_{t,chair=D} = \frac{\sum Population\ of\ Republican\ governor\ states\ in\ t\ with\ election\ in\ t{+}1}{Total\ U.S.\ population\ in\ t}$$

Again, the states with a gubernatorial election in time $t+1$ are weighted according to the population of that particular state. However, there are two other possibilities now for the two equations (5 and 6). For an incumbent state governor and the Fed chairman to have a different political affiliation, either the incumbent state governor is Republican and the Fed chairman is Democratic, or the incumbent state governor is Democratic and the Fed chairman is Republican. The two possibilities are the only difference between the measurements for $ESameParty_t$ in Equations 3 and 4 and the measurements for $EDiffParty_t$ in Equations 5 and 6. Again, it is assumed that for the investigated effect on the Federal Funds Rate it makes no difference whether the first or the second situation is present, so for the variable $EDiffParty_t$ there are two possible measurements. Equation 5 is used when the Fed chairman is Republican and Equation 6 is used when the Fed chairman is Democratic. In Equation 5 the sum of the population of all states with a gubernatorial election in year $t+1$ with a Democratic incumbent state governor in year t is divided by the total population of the U.S. in year t. In Equation 6 the sum of the population of all states with a gubernatorial election in year $t+1$ with a Republican incumbent state governor in year t is divided by the total population of the U.S. in year t. For these data, again the political affiliation of the Fed chairman or state governor with the longest term in year t is included if the Fed chairman or state governor changed in that particular year.

According to this method, the variable $EDiffParty_t$ can take any value between 0 and 1. A value closer to 0 indicates that a relatively smaller part of the U.S. has a gubernatorial election next year and at the same time has an incumbent governor with a different political affiliation than the Fed chairman. A value closer to 1 indicates that a relatively larger part of the U.S. has a gubernatorial election next year and at the same time has an incumbent governor with a different political affiliation than the Fed chairman.

3.1.3 How $ESameParty_t$ and $EDiffParty_t$ complement each other

The reason that both variables are not included as independent variables in the same regression equation is that they are correlated. Therefore, two separate regressions are needed.

A significantly positive effect of $ESameParty_t$ on FFR_t would capture that the Fed offsets the benefits of the incumbent by increasing the Federal Funds Rate, even if they have the same political affiliation. However, when the variable $SameParty_t$ shows an insignificant or negative effect, it would capture that the Fed supports the benefits of the incumbent by keeping the Federal Funds Rate stable or by decreasing it. When analysing the second independent variable $EDiffParty_t$, a significantly positive effect of $EDiffParty_t$ would capture that the Fed offsets the benefits of the incumbent by increasing the Federal Funds Rate. However when the variable $EDiffParty_t$ shows an insignificant or negative effect, it would capture that the Fed supports the benefits of the incumbent by keeping the Federal Funds Rate stable or by decreasing it, even if they have a different political affiliation.

The reason that $ESameParty_t$ and $EDiffParty_t$ are both chosen as independent variables in two separate regressions can be explained as follows. From only one of the variables it is not possible to draw conclusions. For the Fed to be non-independent, it needs to support the incumbent in both cases. And even then it is still possible that it is independent because the support can be their own choice. For the Fed to be independent, it has to be non-supportive (reflected by a Federal Funds Rate increase) in at least one of the cases of $ESameParty_t$ and $EDiffParty_t$. So analysing both independent variables without analysing the other one would give inconclusive results.

There are nine scenarios for outcomes of $ESameParty_t$ and $EDiffParty_t$, which are depicted in Table 1. Each variable can be significantly positive, significantly negative, or insignificant. In scenario 1, both variables are significantly positive. This means that the Fed does not support the incumbent, independent of whether he/she has a similar or a different political affiliation. In this case, the Fed is independent. In scenario 2 $ESameParty_t$ is significantly positive and $EDiffParty_t$ is significantly negative. This means that the Fed does not support an incumbent with a similar political affiliation, while it does support an incumbent with a different political affiliation. This indicates that the Fed is independent. Scenario 3 means that $ESameParty_t$ shows a significantly positive result and $EDiffParty_t$ shows an insignificant result. This again means that the Fed does not support an incumbent with a similar political affiliation, while it does somewhat support an incumbent with a different political affiliation, indicating an independent Fed. Scenario 4 indicates that $ESameParty_t$ is significantly negative and $EDiffParty_t$ is significantly positive. This means that the Fed supports an incumbent with the same political affiliation and that it does not support an incumbent with a different political affiliation. This would mean that the Fed is independent. When both $ESameParty_t$ and $EDiffParty_t$ are significantly negative, like in scenario 5, the Fed supports incumbents with both a similar or a different political affiliation. This means that the Fed could be non-independent since it always supports the government. However, supporting the government could also be an independent choice, meaning that from this analysis it cannot be concluded that the Fed is independent. In scenario 6, $ESameParty_t$ is significantly negative and $EDiffParty_t$ is insignificant. This again means that the Fed supports all incumbents, even though the ones with a different political affiliation receive less support than those with a similar affiliation. This could indicate that the Fed is non-independent but again this cannot be concluded. Scenario 7 shows that $ESameParty_t$ is insignificant and $EDiffParty_t$ is significantly positive. This means that the Fed somewhat supports an incumbent with a similar political affiliation and that it does not support an incumbent with a different political affiliation. This would mean that the Fed is independent. Scenario 8 indicates that $ESameParty_t$ is insignificant and $EDiffParty_t$ is significantly negative. This means that the Fed supports all incumbents, even though incumbents with a similar political affiliation receive less support than those with a different political affiliation. This could mean that the Fed is non-independent but again this cannot be concluded. Lastly, scenario 9 means that both $ESameParty_t$ and

$EDiffParty_t$ show an insignificant result. According to the model presented in Figures 1 and 2, this means that the Fed somewhat supports all incumbents, whether or not they have a similar or different political affiliation. This would indicate that the Fed could be non-independent. Another, and probably more plausible interpretation of scenario 9 would be that the Fed is independent because it reacts more or less according to the Taylor rule. This is more plausible because it cannot be concluded from two insignificant effects that the Fed is non-independent. Because in the regression equation the variables $Inflation_t$ and $Unemployment_t$ are included, $ESameParty_t$ and $EDiffParty_t$ both being insignificant would mean that the Federal Funds Rate is determined by $Inflation$ and $Unemployment$, which shows similarities with the Taylor rule. The Taylor rule would imply that the Fed tries to stabilize the economy and that it is not necessarily influenced by politics. In the cases that scenario 9 is found in the analysis of this paper, it will be interpreted as the Fed using the Taylor rule.

Table 1: Different scenarios for $ESameParty_t$ and $EDiffParty_t$

$EDiffParty_t$ $ESameParty_t$	Significant, positive	Significant, negative	Insignificant
Significant, positive	*Scenario 1*	*Scenario 2*	*Scenario 3*
	No support own party	No support own party	No support own party
	No support other party	Support other party	Support other party
	Fed is independent	Fed is independent	Fed is independent
Significant, negative	*Scenario 4*	*Scenario 5*	*Scenario 6*
	Support own party	Support own party	Support own party
	No support other party	Support other party	Support other party
	Fed is independent	Fed could be non-independent	Fed could be non-independent
Insignificant	*Scenario 7*	*Scenario 8*	*Scenario 9*
	Support own party	Support own party	Support own party
	No support other party	Support other party	Support other party
	Fed is independent	Fed could be non-independent	Taylor rule

3.2 Independent variable $PresFed_t * PresElection_{t+1}$

The independent variable $PresFed_t * PresElection_{t+1}$ is an interaction term that is used to analyse the effect on the Federal Funds Rate of a similar or different political affiliation of the incumbent president and the Fed chairman around presidential elections. $PresElection_{t+1}$ is a dummy that takes value 1 if there is a presidential election in the U.S. in year $t+1$ and 0 if there is not. $PresFed_t$ is a dummy variable that takes value 1 if the incumbent U.S. president and the Fed chairman have a similar political affiliation in time t and it takes value 0 if they have a different political affiliation in time t. A similar political affiliation can either mean that they are both Republican or both Democratic. A different political affiliation can mean that the incumbent president is Republican and the Fed chairman is Democratic or that the incumbent president is Democratic and the Fed chairman is Republican. The interaction term $PresFed_t * PresElection_{t+1}$ captures a similar effect for presidential elections as $ESameParty_t$ and $EDiffParty_t$ for gubernatorial elections. It shows how the Fed reacts to an opportunistic PBC caused by presidential elections held in time $t+1$.

3.3 Control variables

When there are presidential and gubernatorial elections at the same time, it may be the case that the effect of the presidential election suppresses the effect of the gubernatorial election because the presidential elections may then considered to be more important. It is therefore important to control for the effect of presidential elections by including the variable $PresElection_{t+1}$ in the regression. Moreover, both $ESameParty_t$ and $EDiffParty_t$ are interacted with $PresElection_{t+1}$. The purpose of these interaction terms is to analyse whether the effects of $ESameParty_t$ and $EDiffParty_t$ change when there is a presidential election in the same year as a gubernatorial election.

FFR_{t-1} is the Federal Funds rate in year $t-1$. A lagged dependent variable is included to control for the effect of the Federal Funds Rate in year $t-1$ on the Federal Funds Rate in year t.

Following Clark and Arel-Bundock (2013), an objection can be that the Fed also responds to underlying macroeconomic conditions and therefore the change in the Federal Funds Rate does not only capture the Fed's response to opportunistic PBCs. Therefore, it is necessary to control for these conditions. $Unemployment_t$ and $Inflation_t$ are included in the regression because these variables reflect the Fed's dual mandate. $Unemployment_t$ shows the unemployment rate in the U.S. in year t. $Inflation_t$ shows the inflation rate in the U.S. in year t.

3.4 Data

For the time series analysis, yearly data is analysed. The data are from the years 1960 to 2008. In 1951, the Fed became officially independent. The U.S. Treasury Department and the Fed reached the Treasury-Fed Accord, which meant that the U.S. Treasury was no longer in control of the interest rates. It was now the Fed who was in charge of the interest rates and monetary policy. Because of this agreement, the Fed and its monetary policy became less politically influenced. Therefore, the most recent data that is available after 1951 will be retrieved.

Following Clark and Arel-Bundock (2013), the Federal Reserve Economic Database (FRED) from the St. Louis Fed is used as data source. The FRED has annual data available for the Federal Funds Rate, population per state, total population of the U.S., the unemployment rate and the inflation rate. Data for the population per state are collected for all 50 states.

For inflation data, the first year of data available starts later compared to the first year of data available for the other variables. The data for inflation start in 1960, so therefore 1960 is chosen as the first year of the time series. The reason that data until 2008 is used is that the Federal Funds Rate became nearly zero after that year.

The summary statistics of the data are presented in Table 2.

Table 2: Summary statistics without first differences

Variable	N	Mean	St. Dev.	Min	Max
FFR_t	47	6.133	3.192	1.130	16.390
$SameParty_t$	47	0.154	0.194	0.000	0.618
$DiffParty_t$	47	0.109	0.133	0.000	0.536
FFR_{t-1}	47	6.095	3.216	1.130	16.390
$Inflation_t$	47	4.268	2.859	1.071	13.549
$Unemployment_t$	47	5.853	1.438	3.492	9.708
$PresElection_{t+1}$	47	0.255	0.441	0	1
$PresFed_t$	47	0.511	0.505	0	1

3.5 Statistical assumptions checks

The data were checked on statistical assumptions. First, the data were tested for homoscedasticity. Based on a Breusch-Pagan test, there is no reason to believe the data are not homoscedastic. Second, the data were tested for autocorrelation. Based on the Durbin-Watson test, the evidence was inconclusive (without the variable FFR_{t-1} there was autocorrelation). This is solved in a later stage of the statistical assumption checks. Third, the data were tested for stationarity. By performing an augmented Dickey-Fuller test, it was found that the model is non-stationary. Therefore it was tested which individual variables are non-stationary. The variables that are non-stationary are FFR_t, $ESameParty_t$, $EDiffParty_t$, FFR_{t-1}, $Inflation_t$ and $Unemployment_t$. Fourth, the data were tested for multicollinearity. Based on multiple Variance Inflation Factor (VIF) tests, there is no multicollinearity found.

Because the data were non-stationary, first differences of the variables FFR_t, $ESameParty_t$, $EDiffParty_t$, FFR_{t-1}, $Inflation_t$ and $Unemployment_t$ are taken. The summary statistics for the variables with first differences are shown in Table 3. Because taking first differences changes the data, the tests for homoscedasticity, autocorrelation and multicollinearity were performed again. Moreover, the test for stationarity was performed again to test whether taking first differences of the non-stationary variables made the model stationary. The augmented Dickey-Fuller test shows the model is stationary after taking first differences. The Durbin-Watson test gives clearer results after taking first differences. It now shows that there is no evidence of autocorrelation. VIF tests indicate that there is still no multicollinearity in the data. However, the Breusch-Pagan test now indicates that the data became heteroscedastic after taking first differences.

To solve for the heteroscedasticity of the model with first differences, weighted least squares regressions are performed instead of ordinary least squares regressions. In the weighted least squares regression, values with smaller variance are given a heavier weight than values with greater variance.

Table 3: Summary statistics with first differences

Variable	N	Mean	St. Dev.	Min	Max
ΔFFR_t	47	0.039	1.916	-4.690	4.300
$\Delta SameParty_t$	47	-0.00005	0.327	-0.592	0.563
$\Delta DiffParty_t$	47	0.001	0.228	-0.520	0.536
ΔFFR_{t-1}	47	0.035	1.917	-4.690	4.300
$\Delta Inflation_t$	47	0.030	1.690	-4.203	4.877
$\Delta Unemployment_t$	47	-0.020	0.893	-2.092	2.833
$PresElection_{t+1}$	47	0.255	0.441	0	1
$PresFed_t$	47	0.511	0.505	0	1

4 Results

4.1 Gubernatorial elections

The results of the weighted least squares regressions are presented in Table 4. Column 1 shows the results of the weighted least squares regression with $\Delta ESameParty_t$ as independent variable. Column 2 shows the results of the weighted least squares regression with $\Delta EDiffParty_t$ as independent variable. As depicted in column 1 of Table 4, the variable $\Delta ESameParty_t$ shows a coefficient of 0.455. This coefficient shows the first difference between time $t-1$ and time t, so it means that the Federal Funds Rate increases with 0.455 when the variable $\Delta ESameParty_t$ increases with 1. The coefficient of 0.445 shows a positive but insignificant effect on the Federal Funds Rate. This means that when the weighted average of incumbent governors with the same political affiliation as the Fed chairman is higher, the benefit of increased fiscal spending is not offset by the Fed, increasing the incumbent governors' re-election chances.

As also discussed in section 2.4, hypothesis 1 was the following:

Hypothesis 1: When the weighted share of incumbent governors with an election next year with the same political affiliation as the Fed chairman is higher, the Federal Funds Rate is expected to stay constant or decrease.

The insignificant result is consistent with the first hypothesis. The Federal Funds Rate is not significantly affected by a change in $\Delta ESameParty_t$. This means that the benefit of increased fiscal spending for the incumbent state governors is not offset by the Fed. However, the result would be stronger if it would significantly decrease because this would mean that the Fed even increases the benefit of increased fiscal spending. With the insignificant result, it does neither offset nor increase the benefit of increased fiscal spending, so there is still some benefit for the incumbent state governor.

Moreover, as depicted in column 2 of Table 4, the variable $\Delta EDiffParty_t$ shows a coefficient of 1.406. This coefficient also indicates the first difference between time $t-1$ and time t. The coefficient of 1.406 shows a positive and significant effect on the Federal Funds Rate, but only at the 10% significance level. This means that when the weighted average of incumbent governors with a different political affiliation than the Fed chairman is higher, there is some evidence that the benefit of increased fiscal spending is offset by the Fed, decreasing the incumbent governors' re-election chances.

As also discussed in section 2.4, hypothesis 2 was the following:

Hypothesis 2: When the weighted share of incumbent governors with an election next year with a different political affiliation than the Fed chairman is higher, the Federal Funds Rate is expected to increase.

The significantly positive result is consistent with the second hypothesis, even though the evidence is not overly strong. The Federal Funds Rate is significantly affected by a change in $\Delta EDiffParty_t$ at the 10% level. This means that the benefit of increased fiscal spending for the incumbent state governors is offset by the Fed.

These results are consistent with scenario 7 in Table 1, indicating that the Fed is independent because it does not support the incumbent government in all cases. Nevertheless, it is not completely politically unbiased. The Fed does not offset the benefit of increased fiscal spending (by increasing the Federal Funds Rate) for the incumbent governors with an upcoming election with the same political affiliation as the Fed chairman. However, the Fed does offset the benefit of increased fiscal spending (by increasing the Federal Funds Rate) for the incumbent governors with an upcoming election with a different political affiliation than the Fed chairman. This results in a higher re-election chance for incumbent governors with a similar political affiliation as the Fed chairman than for incumbent governors with a different political affiliation than the Fed chairman. Even though this effect is weakly significant (at the 10% level), it does indicate that the Federal Funds Rate increases at a higher rate when the incumbent governors and the Fed chairman have a different political affiliation than when they have the same political affiliation.

The interaction terms of the two independent variables $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ with $PresElection_{t+1}$, that show whether the results of the two independent variables are different when there are presidential elections in the same year as gubernatorial elections, are not significant. This means that the effects of $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ are not affected by a presidential election in the same year as a gubernatorial election.

4.2 Presidential elections

As depicted in Table 4, the coefficient of $PresElection_{t+1}$ is negative and significant at the 10% level for the regression with $\Delta ESameParty_t$ (-0.950) and is also negative but insignificant for the regression with $\Delta EDiffParty_t$ (-0.517). This means that in general when there is a presidential election, the Federal Funds Rate slightly decreases, meaning that there could be some support for the incumbent president by the Fed.

As also depicted in Table 4, the interaction terms of $PresElection_{t+1}$ and $PresFed_t$, which are 0.784 for the regression with $\Delta ESameParty_t$ and 0.690 for the regression with $\Delta EDiffParty_t$, are insignificant. This means that the effect of a presidential election on the Federal Funds Rate does not differ in the situations when the political affiliation of the incumbent president and the Fed chairman is similar or different. This means that overall, the effect of a presidential election on the Federal Funds Rate is negative with some weak significance. This indicates that the Fed somewhat supports the incumbent government with any political affiliation, possibly showing their non-independence. However, it cannot be concluded from a weak effect like this that the Fed is non-independent around presidential elections.

As also discussed in section 2.4, hypothesis 3 was the following:

Hypothesis 3: When there is a presidential election in the next year and the incumbent president and the Fed chairman have the same political affiliation, the Federal Funds Rate is expected to be significantly lower than when they have a different political affiliation.

The insignificant result of the interaction term of $PresElection_{t+1}$ and $PresFed_t$ is not consistent with the third hypothesis. The Federal Funds Rate is not affected by a similar or a different political affiliation of the incumbent president and the Fed chairman.

Table 4: Weighted Least Squares Regression Results

	Dependent variable:	
	FFR_t	
	(1)	(2)
$\Delta ESameParty_t$	0.455	
	(0.549)	
$\Delta EDiffParty_t$		1.406^{*}
		(0.764)
$PresElection_{t+1}$	-0.950^{*}	-0.517
	(0.534)	(1.133)
$PresFed_t$	-0.179	-0.239
	(0.428)	(0.401)
ΔFFR_{t-1}	0.297^{***}	0.301^{***}
	(0.106)	(0.103)
$\Delta Unemployment_t$	-1.284^{***}	-1.202^{***}
	(0.226)	(0.226)
$\Delta Inflation_t$	0.399^{***}	0.413^{***}
	(0.130)	(0.123)
$\Delta ESameParty * PresElection_{t+1}$	0.031	
	(3.559)	
$\Delta EDiffParty * PresElection_{t+1}$		-7.208
		(11.977)
$PresElection_{t+1} * PresFed_t$	0.784	0.690
	(0.746)	(0.807)
Constant	0.227	0.283
	(0.307)	(0.290)
Observations	47	47
R^2	0.792	0.783
Adjusted R^2	0.749	0.737
Residual Std. Error (df = 38)	1.535	1.504
F Statistic (df = 8; 38)	18.120^{***}	17.134^{***}
Note:		$^{*}p^{**}p^{***}p<0.01$

The two weighted least squares regressions include data from all 50 U.S. states and national level variables from 1960 to 2008 to analyse time series data. Moreover, time series data from 1960 to 2008 are collected for the U.S. for the control variables ($\Delta Unemployment_t$, $\Delta Inflation_t$, and $PresElection_{t+1}$). The independent variable analysing gubernatorial elections in regression (1) is $\Delta ESameParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with the same political affiliation as the Fed chairman. The independent variable in regression (2) analysing gubernatorial elections is $\Delta EDiffParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with a different political affiliation than the Fed chairman. The independent variable analysing presidential elections is $PresElection_{t+1} * PresFed_t$, with $PresFed_t$ being a dummy taking value 1 if the incumbent president and the Fed chairman have the same political affiliation and taking value 0 if their political affiliation is different. The dependent variable is the Federal Funds Rate. The table shows regression coefficients and the corresponding standard deviations between brackets. ***, **, * show statistical significance at the levels of 1%, 5%, and 10%, respectively.

4.3 Robustness checks

4.3.1 Pre-1985 and post-1985

The dataset is split into a period before 1985 and a period after 1985 because of the findings by Milani (2010) that show that before 1985 monetary policy was more expansionary than after 1985. Because the split-up data were not heteroscedastic anymore, two time series regressions have been performed instead of two weighted least squares regressions. The results are depicted in Table 5.

Table 5: Time series regression before and after 1985 Results

	Dependent variable:			
	FFR_t			
	(1) Before 1985	(2) After 1985	(3) Before 1985	(4) After 1985
$\Delta ESameParty_t$	1.750*	-0.528		
	(0.922)	(0.563)		
$\Delta EDiffParty_t$			2.662**	-0.796
			(0.984)	(0.902)
$PresElection_{t+1}$	-1.036	-0.196	-0.527	2.538*
	(1.166)	(0.696)	(2.056)	(1.390)
$PresFed_t$	-0.573	0.842	-0.600	0.884*
	(0.612)	(0.533)	(0.557)	(0.500)
ΔFFR_{t-1}	0.517**	0.063	0.411*	0.024
	(0.239)	(0.145)	(0.215)	(0.138)
$\Delta Unemployment_t$	-1.536***	-2.126***	-1.203**	-2.150***
	(0.493)	(0.513)	(0.454)	(0.480)
$\Delta Inflation_t$	0.300*	0.565	0.353**	0.596*
	(0.171)	(0.335)	(0.155)	(0.311)
$\Delta ESameParty_t * PresElection_{t+1}$	-2.960	35.746		
	(6.151)	(22.554)		
$\Delta EDiffParty_t * PresElection_{t+1}$			-14.407	-37.615*
			(21.032)	(17.938)
$PresElection_{t+1} * PresFed_t$	0.892	-0.699	0.938	-0.418
	(1.705)	(1.146)	(1.428)	(0.930)
Constant	0.797*	-0.874*	0.831**	-0.913**
	(0.424)	(0.427)	(0.387)	(0.400)
Observations	24	23	24	23
R^2	0.805	0.750	0.839	0.777
Adjusted R^2	0.701	0.607	0.753	0.650
Residual Std. Error	1.257 (df = 15)	0.887 (df = 14)	1.144 (df = 15)	0.838 (df = 14)
F Statistic	7.756*** (df = 8; 15)	5.254*** (df = 8; 14)	9.752*** (df = 8; 15)	6.098*** (df = 8; 14)
Note:				*p**p***p<0.01

The two weighted least squares regressions include data from all 50 U.S. states and national level variables from 1960 to 2008 to analyse time series data. Moreover, time series data from 1960 to 2008

are collected for the U.S. for the control variables ($\Delta Unemployment_t$, $\Delta Inflation_t$, and $PresElection_{t+1}$). The independent variable analysing gubernatorial elections in regression (1) and (2) is $\Delta ESameParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with the same political affiliation as the Fed chairman. The independent variable in regression (3) and (4) analysing gubernatorial elections is $\Delta EDiffParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with a different political affiliation than the Fed chairman. The independent variable analysing presidential elections is $PresElection_{t+1} * PresFed_t$, with $PresFed_t$ being a dummy taking value 1 if the incumbent president and the Fed chairman have the same political affiliation and taking value 0 if their political affiliation is different. The dependent variable is the Federal Funds Rate. In the table, a robustness check is shown which split the data into a period before 1985 ((1) and (3)) and after 1985 ((2) and (4)). The table shows regression coefficients and the corresponding standard deviations between brackets. ***, **, * show statistical significance at the levels of 1%, 5%, and 10%, respectively.

4.3.1.1 Gubernatorial elections

As depicted in Table 5, before 1985 (column 1 and 3) the coefficients for $\Delta ESameParty_t$ (1.750) and $\Delta EDiffParty_t$ (2.662) were significantly positive at the 10% and 5% level, respectively. This means that before 1985, opportunistic PBCs were offset by increasing the Federal Funds Rate, which decreases the re-election chances of the incumbent governors. However, the re-election chances of incumbent state governors with a different political affiliation than the Fed chairman were decreased more than for governors with a similar political affiliation. After 1985 (column 2 and 4), the coefficients for $\Delta ESameParty_t$ (-0.528) and $\Delta EDiffParty_t$ (-0.796) were insignificant.

Before 1985, the Fed acted according to scenario 1 from Table 1, meaning that there is no support for any party which makes the Fed independent. However, after 1985, the Fed acted according to scenario 9 from Table 1. When an insignificant result is interpreted as support from the Fed for the incumbent (because the increased fiscal spending benefit is not offset) like in Figures 1 and 2, scenario 9 means that the Fed supports the incumbent in any case. This indicates that it might be non-independent. However, the regressions in Equations 1 and 2 also contain the variables $Inflation$ and $Unemployment$, which shows similarities with the Taylor rule. Therefore, a insignificant effect of the $\Delta ESameParty_t$ $\Delta EDiffParty_t$ could also mean that the Fed reacts according to the Taylor rule, which would be independent of political influence. Therefore it is not possible to conclude that the Fed is non-independent.

Three out of four interaction terms of the two independent variables $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ with $PresElection_{t+1}$, that show whether the results of the two independent variables are different when there are presidential elections in the same year as gubernatorial elections, are insignificant. In the case of the regression with $\Delta EDiffParty_t$ as independent variable after 1985, the interaction term is negative and significant at the 10% level. This indicates that when there is also a presidential election, after 1985 the effect of $\Delta EDiffParty_t$ is decreased, meaning that the presidential election has a weak influence on the effect of $\Delta EDiffParty_t$ on the Federal Funds Rate ΔFFR_t. However, taking into consideration the other three coefficients of the interaction terms of $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ with $PresElecion_{t+1}$ in column 1, 2, and 3, generally the effects of $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ are not strongly affected by a presidential election in the same year as a gubernatorial election.

4.3.1.2 Presidential elections

As depicted in Table 5, the coefficients of $PresElection_{t+1}$ are insignificant before 1985 (-1.036 and -0.527) and insignificant and significantly positive at the 10% level after 1985 (-0.196 and 2.538). This means that before 1985 the benefit of increased fiscal spending for the incumbent president was generally not offset, whereas there is some weak evidence that after 1985 this benefit was offset.

As also depicted in Table 5, the interaction term of $PresElection_{t+1}$ and $PresFed_t$ is insignificant in both regressions before 1985 (0.892 and 0.938) and also insignificant in both regressions after 1985 (-0.699 and -0.418). This indicates that the effect of a presidential election on the Federal Funds Rate is not different when the political affiliation of the incumbent president and the Fed chairman is similar or different, both before and after 1985. This means that overall, the effect of a presidential election on the Federal Funds Rate is insignificant before 1985 and slightly positive after 1985 and this does not differ for presidents with similar or different political affiliations than the Fed chairman. So before 1985, the Fed did not offset the benefit of the incumbent president with any political affiliation, and after 1985 it did offset this benefit weakly. This could indicate that before 1985 the Fed was non-independent. However, it could also indicate that it reacted according to the Taylor rule. After

1985, it reacted independently. In any case, it cannot be concluded that the Fed reacts non-independent before 1985.

4.3.2 Only small states

It seems likely that the results as presented in Table 4 are mainly driven by large states because these are more influential than small states. To find out whether the effect corresponding to scenario 7 from Table 1 still holds for only small states, the analysis is repeated but then with a dataset of only small states. The decision whether a state is a small or large state is based on population. The 40 states with the smallest population according to the FRED database in the middle of the time series (in 1984) are included in the dataset. This corresponds to a population of roughly less than 6,000,000 people. This means that all states are included except California, New York, Texas, Pennsylvania, Illinois, Florida, Ohio, Michigan, New Jersey, and North Carolina. Because the data were heteroscedastic, weighted least squares regressions were performed. The results of the analysis are presented in Table 6.

Table 6: Weighted Least Squares Regression Small States

	Dependent variable:	
	FFR_t	
	(1)	(2)
$\Delta ESameParty_t$	1.635	
	(1.425)	
$\Delta EDiffParty_t$		3.274
		(2.086)
$PresElection_{t+1}$	-0.997**	0.191
	(0.491)	(1.246)
$PresFed_t$	-0.185	-0.229
	(0.425)	(0.408)
ΔFFR_{t-1}	0.281***	0.292***
	(0.102)	(0.101)
$\Delta Unemployment_t$	-1.256***	-1.222***
	(0.222)	(0.219)
$\Delta Inflation_t$	0.413***	0.415***
	(0.127)	(0.123)
$\Delta ESameParty_t$ * $PresElection_{t+1}$	1.366	
	(7.124)	
$\Delta EDiffParty_t$ * $PresElection_{t+1}$		-22.744
		(18.541)
$PresElection_{t+1}$ * $PresFed_t$	0.695	0.352
	(0.754)	(0.842)
Constant	0.243	0.293
	(0.306)	(0.298)
Observations	47	47
R^2	0.818	0.807
Adjusted R^2	0.779	0.767
Residual Std. Error (df = 38)	1.552	1.561
F Statistic (df = 8; 38)	21.327***	19.894***
Note:		*p**p***p<0.01

The two weighted least squares regressions include data from all 50 U.S. states and national level variables from 1960 to 2008 to analyse time series data. Moreover, time series data from 1960 to 2008

are collected for the U.S. for the control variables ($\Delta Unemployment_t$, $\Delta Inflation_t$, and $PresElection_{t+1}$). The independent variable analysing gubernatorial elections in regression (1) is $\Delta ESameParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with the same political affiliation as the Fed chairman. The independent variable in regression (2) analysing gubernatorial elections is $\Delta EDiffParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with a different political affiliation than the Fed chairman. The independent variable analysing presidential elections is $PresElection_{t+1} * PresFed_t$, with $PresFed_t$ being a dummy taking value 1 if the incumbent president and the Fed chairman have the same political affiliation and taking value 0 if their political affiliation is different. The dependent variable is the Federal Funds Rate. In the table, a robustness check is shown which only includes data from small states in terms of population. The table shows regression coefficients and the corresponding standard deviations between brackets. ***, **, * show statistical significance at the levels of 1%, 5%, and 10%, respectively.

As depicted in Table 6, the coefficients for $\Delta ESameParty_t$ (1.635) and $\Delta EDiffParty_t$ (3.274) were insignificant. This means that the increased fiscal spending was not offset nor supported by the Fed when only considering small states. This result is consistent with scenario 9 from Table 1. When an insignificant result is interpreted as support from the Fed for the incumbent (because the benefit of increased fiscal spending is not offset), scenario 9 means that the Fed supports the incumbent in any case. This indicates that it might be non-independent. However, the regressions in Equations 1 and 2 also contain the variables $Inflation_t$ and $Unemployment_t$, which shows similarities with the Taylor rule. Therefore, a insignificant effect of the $\Delta ESameParty_t$ $\Delta EDiffParty_t$ could also mean that the Fed reacts according to the Taylor rule, which would be independent of political influence. Therefore it is not possible to conclude that the Fed is non-independent when only considering small states. When comparing these results to the results of the main analysis presented in Table 4, it becomes clear that the effect found in Table 4, which showed that the benefit of increased fiscal spending is offset more when political affiliations are different than when they are similar, disappears for only small states

The interaction terms of the two independent variables $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ with $PresElection_{t+1}$, that show whether the results of the two independent variables are different when there are presidential elections in the same year as gubernatorial elections, are also insignificant. This means that the effects of $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ are not affected by a presidential election in the same year as a gubernatorial election in small states.

4.3.3 Only large states

It seems likely that the results as presented in Table 4 are mainly driven by large states. To find out whether the effect corresponding to scenario 7 from Table 1 still holds for only small states, the analysis is repeated but then with a dataset consisting of only large states. The decision whether a state is small or large is based on population. The 10 states with the largest population according to the FRED database in the middle of the time series (in 1984) are included in the dataset. This corresponds to a population of roughly more than 6,000,000 people. This means that the states that are included in the dataset are California, New York, Texas, Pennsylvania, Illinois, Florida, Ohio, Michigan, New Jersey, and North Carolina. Because the data were heteroscedastic, weighted least squares regressions were performed. The results of the analysis are presented in Table 7.

Table 7: Weighted Least Squares Regression Large States

	Dependent variable:	
	FFR_t	
	(1)	(2)
$\Delta ESameParty_t$	0.561	
	(0.869)	
$\Delta EDiffParty_t$		2.302^{**}
		(1.135)
$PresElection_{t+1}$	-0.884	-1.305^{**}
	(0.565)	(0.576)
$PresFed_t$	-0.178	-0.255
	(0.428)	(0.400)
ΔFFR_{t-1}	0.305^{***}	0.274^{***}
	(0.107)	(0.095)
$\Delta Unemployment_t$	-1.289^{***}	-1.225^{***}
	(0.229)	(0.205)
$\Delta Inflation_t$	0.393^{***}	0.409^{***}
	(0.131)	(0.116)
$\Delta ESameParty_t$ * $PresElection_{t+1}$	-1.280	
	(6.509)	
$\Delta EDiffParty_t$ * $PresElection_{t+1}$		7.310
		(14.486)
$PresElection_{t+1}$ * $PresFed_t$	0.821	1.033
	(0.737)	(0.669)
Constant	0.219	0.287
	(0.307)	(0.290)
Observations	47	47
R^2	0.781	0.838
Adjusted R^2	0.735	0.803
Residual Std. Error (df = 38)	1.528	1.514
F Statistic (df = 8; 38)	16.961^{***}	24.502^{***}
Note:		$^{*}p^{**}p^{***}p<0.01$

The two weighted least squares regressions include data from all 50 U.S. states and national level variables from 1960 to 2008 to analyse time series data. Moreover, time series data from 1960 to 2008

are collected for the U.S. for the control variables ($\Delta Unemployment_t$, $\Delta Inflation_t$, and $PresElection_{t+1}$). The independent variable analysing gubernatorial elections in regression (1) is $\Delta ESameParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with the same political affiliation as the Fed chairman. The independent variable in regression (2) analysing gubernatorial elections is $\Delta EDiffParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with a different political affiliation than the Fed chairman. The independent variable analysing presidential elections is $PresElection_{t+1} * PresFed_t$, with $PresFed_t$ being a dummy taking value 1 if the incumbent president and the Fed chairman have the same political affiliation and taking value 0 if their political affiliation is different. The dependent variable is the Federal Funds Rate. In the table, a robustness check is shown which only includes data of large states in terms of population. The table shows regression coefficients and the corresponding standard deviations between brackets. ***, **, * show statistical significance at the levels of 1%, 5%, and 10%, respectively.

As presented in Table 7, the coefficient for $\Delta ESameParty_t$ (0.561) was insignificant and the coefficient for $\Delta EDiffParty_t$ (2.302) was positively significant at the 5% level. This result corresponds to the results as depicted in Table 4, but the effect is stronger. In Table 4, the coefficient for $\Delta ESameParty_t$ was insignificant as well but the coefficient for $\Delta EDiffParty_t$ was only significant at the 10% level. These results mean that when the incumbent governors and the Fed chairman have the same political affiliation, the Federal Funds Rate is increased less than when they have a different political affiliation. This means that the benefit of increased fiscal spending is offset in the case that their political affiliations are different, whereas the benefit of increased fiscal spending is not offset when their political affiliations are the same. This results in a higher re-election chance for incumbent state governors with the same political affiliation than for those with a different political affiliation. And for large states (Table 7), this effect is stronger than when both small and large states (Table 4) are included in the dataset. Therefore, the results of the main analysis (Table 4) are mainly driven by large states. These results still mean that the Fed is independent because it does not support the incumbent government in all cases. Nevertheless, it is not completely politically unbiased.

The interaction terms of the two independent variables $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ with $PresElection_{t+1}$, that show whether the results of the two independent variables are different when there are presidential elections in the same year as gubernatorial elections, are insignificant. This means that the effects of $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ are not affected by a presidential election held in the same year as a gubernatorial election in large states.

4.3.4 Number of states (no weighting)

For this robustness check, $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ have not been weighted according to population like in Equations 3, 4, 5, and 6. Instead, they simply represent the number of states with an election next period with a similar or a different incumbent state governor than the Fed chairman. Therefore, in this robustness check, all states have equal weight. Because the data were heteroscedastic, weighted least squares regressions were performed. The results are presented in Table 8.

Table 8: Weighted Least Squares Regression no Weighting of States

	Dependent variable:	
	FFR_t	
	(1)	(2)
$\Delta ESameParty_t$	0.011	
	(0.012)	
$\Delta EDiffParty_t$		0.027*
		(0.016)
$PresElelection_{t+1}$	-1.073*	0.055
	(0.635)	(1.349)
$PresFed_t$	-0.182	-0.204
	(0.427)	(0.401)
ΔFFR_{t-1}	0.289***	0.315***
	(0.104)	(0.105)
$\Delta Unemployment_t$	-1.281***	-1.283***
	(0.223)	(0.228)
$\Delta Inflation_t$	0.405***	0.396***
	(0.128)	(0.123)
$\Delta ESameParty_t$ * $PresElection_{t+1}$	0.014	
	(0.080)	
$\Delta EDiffParty_t$ * $PresElection_{t+1}$		-0.189
		(0.191)
$PresElection_{t+1}$ * $PresFed_t$	0.744	0.566
	(0.750)	(0.779)
Constant	0.243	0.276
	(0.308)	(0.291)
Observations	47	47
R^2	0.800	0.785
Adjusted R^2	0.757	0.739
Residual Std. Error (df = 38)	1.553	1.522
F Statistic (df = 8; 38)	18.946***	17.322***
Note:		*p**p***p<0.01

The two weighted least squares regressions include data from all 50 U.S. states and national level variables from 1960 to 2008 to analyse time series data. Moreover, time series data from 1960 to 2008 are collected for the U.S. for the control variables ($\Delta Unemployment_t$, $\Delta Inflation_t$, and $PresElection_{t+1}$). The independent variable analysing gubernatorial elections in regression (1) is $\Delta ESameParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with the same political affiliation as the Fed chairman. The independent variable in regression (2) analysing gubernatorial elections is $\Delta EDiffParty_t$, indicating a weighted share of states with a gubernatorial election in the next year that has an incumbent state governor with a different political affiliation than the Fed chairman. The independent variable analysing presidential elections is $PresElection_{t+1} * PresFed_t$, with $PresFed_t$ being a dummy taking value 1 if the incumbent president and the Fed chairman have the same political affiliation and taking value 0 if their political affiliation is different. The dependent variable is the Federal Funds Rate. In the table, a robustness check is shown which does not weigh the states according to population so every state has equal weight. The table shows regression coefficients and the corresponding standard deviations between brackets. ***, **, * show statistical significance at the levels of 1%, 5%, and 10%, respectively.

As presented in Table 8, the coefficient for $\Delta ESameParty_t$ (0.011) was insignificant and the coefficient for $\Delta EDiffParty_t$ (0.027) was positively significant at the 10% level. This result is consistent with the results depicted in Table 4. In Table 4, the coefficient for $\Delta SameParty_t$ was insignificant and the coefficient for $\Delta EDiffParty_t$ was only significant at the 10% level as well. These results mean that when the incumbent governors and the Fed chairman have the same political affiliation, the Federal Funds Rate is increased less than when they have a different political affiliation, both with and without weighting of the states according to population. This indicates that the benefit of increased fiscal spending is offset in the case that their political affiliations are different, whereas the benefit of increased fiscal spending is not offset when their political affiliations are the same. This results in a higher re-election chance for incumbent state governors with the same political affiliation than for those with a different political affiliation. These results correspond with scenario 7 in Table 1, indicating that the Fed is independent because it does not support the incumbent government in all cases. Nevertheless, it is not completely politically unbiased.

The interaction terms of the two independent variables $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ with $PresElection_{t+1}$, that show whether the results of the two independent variables are different when there are presidential elections in the same year as gubernatorial elections, are insignificant. This means that the effects of $\Delta ESameParty_t$ and $\Delta EDiffParty_t$ are not affected by a presidential election held in the same year as a gubernatorial election..

5 Discussion

5.1 Gubernatorial elections

For the discussion of the results of the gubernatorial elections, it is important to keep in mind that some papers may not be fully comparable to the results of the gubernatorial elections in this paper. This is the case because presidential elections may be considered to be more important by voters and by the Fed because they are more central and therefore have a stronger effect on the Federal Funds Rate. Still, the insights of those papers are useful to explain the results of the gubernatorial elections of this paper.

In this paper it was found that when the weighted share of governors with the same political affiliation as the Fed chairman is higher, the Fed does not change the Federal Funds Rate, meaning that the re-election chances of the incumbent state governors are not reduced because the effect of increased fiscal spending is not offset. On the contrary, it was found that when the weighted share of governors with a different political affiliation than the Fed chairman is higher, there is some weak evidence that the Fed increases the Federal Funds Rate, which decreases the re-election chances of the incumbent state governors because the effect of increased fiscal spending is offset. These results are consistent with Dentler (2019) and Abrams and Iossifov (2006), although in those papers the effects were stronger. A reason that the results in this paper are weaker could be that voters for gubernatorial elections dislike fiscal spending increases. As was found by Kim and Kwon (2015), increased welfare spending in U.S. states, which is part of fiscal spending, decreases the re-election chances of the incumbent governor. This reflects that voters care about the debt increase caused by increased fiscal spending in U.S. states. A similar result was found by Peltzman (1992). A result of this could be that incumbent state governors have become more reluctant to spend a lot. This smaller increase in fiscal spending before elections would then lead to a smaller opportunistic PBC and therefore less additional fiscal spending to offset by the Fed, which in turn could lead to weaker results in the analysis of this paper.

However, the results are not consistent with Maier (2002) who found that before elections in the U.S., the increased fiscal spending was generally offset by increasing the Federal Funds Rate, whereas this paper only found this offsetting in case of a different political affiliation of the incumbent state governors and the Fed chairman. Apart from the fact that Maier (2002) did not distinguish between political affiliations in the analysis and that the difference in results may be driven by this, another reason for this difference may be the time periods analysed, which were 1960 to 1993 in Maier (2002) and 1960 to 2008 in this paper. In the robustness check of this paper that split the results into a period before and after 1985 (Table 5), it was found that the Fed offset the increased fiscal spending before 1985 by increasing the Federal Funds Rate, and after 1985 it did not. The largest part of Maier (2002) was before 1985, so these similar findings could indicate that in the period before 1985, the Fed generally increased the Federal Funds Rate. Moreover, it implies that the part of the results of this paper that was not consistent with Maier (2002) (that indicated that there is no offsetting of increased fiscal spending) were mainly driven by the period after 1993. The reason for the insignificant reaction by the Fed after 1985, as opposed to a significant Federal Funds Rate increase before 1985, could be that the Fed started following the Taylor rule more.

At the same time, the findings of the robustness check in Table 5 are not consistent with Milani (2010). The robustness check in Table 5 found that the Fed offset the increased fiscal spending before 1985 by increasing the Federal Funds Rate and after 1985 they did not. On the contrary, Milani (2010) found that the Fed's monetary policy became less expansionary after 1985 than before 1985. As will be discussed in Section 5.2, the Fed indeed weakly shows this result around presidential elections. However, the reason why the effect around gubernatorial elections is the opposite remains puzzling. It could be the case that gubernatorial elections became more important over time or that governors gained more power over time, which makes it worthwhile for the Fed to not offset the increased fiscal spending anymore. However, this is just speculation and further research would be needed to explain this effect.

What was also found is that the results for the gubernatorial elections are mainly driven by the 10 largest states according to population and not by the 40 smallest states. This is consistent with Crombach, Bohn, and Sturm (2023), who found that the European Central Bank's (ECB) monetary policy reaction is less strong for fiscal shocks in small member countries than in large member countries.

5.2 Presidential elections

This paper found that when there is a presidential election in the same year as a gubernatorial election, this does not change the effect of the gubernatorial election. However, it may seem logical that there is a stronger effect of a presidential election on the Federal Funds Rate than for gubernatorial elections because presidential elections are more central and could be considered to be more important by voters. It would then also be expected that when there is a presidential election, the gubernatorial election matters less, decreasing the effect of the gubernatorial election. Still, the effect that was found is not surprising considering the findings of Chang et al. (2009). They investigated opportunistic PBCs on both a state and national level as well and found that a presidential election in the same year as a gubernatorial election does not have an additional effect on fiscal spending of the state government. Therefore, the result in this paper that a presidential election and a gubernatorial election in the same year do not have an additional effect on the Federal Funds Rate is not surprising because there is no additional fiscal spending in the states to offset by monetary policy. This is logically followed by an absence of a change in the Federal Funds Rate.

When investigating the presidential elections, it was found that there is a weak indication that the Fed supports the incumbent president by not increasing or even slightly decreasing the Federal Funds Rate when there is a presidential election in the next year. This effect was not driven by political affiliation. This result possibly indicates that the Fed is non-independent because the incumbent president is supported in any case. However, the effect of support was only weak and it cannot be concluded from this weak evidence that the Fed is non-independent, especially because it could have been an independent choice by the Fed to support all incumbents. Moreover, this result is close to the Taylor rule. This finding is consistent with Kuper (2018), who also found that from 1987 to 2006, the Fed did not actively support incumbent presidents by decreasing the Federal Funds Rate. However, it was also not the case that the Fed reacted exactly according to the Taylor rule, as was also the case in this paper.

By splitting the results of this paper into periods before and after 1985, it was found that after 1985 there was some weak evidence that the Federal Funds Rate increased before presidential elections, and before 1985 this evidence was not present. This is consistent with but weaker than the findings by Milani (2010), who found that the Fed created less expansionary monetary policy after 1985 than before 1985. These results could be explained by Richards (1986), who indicated that before 1975 voters did not consider political influences in their macro-economic expectations in that period, whereas after 1975 voters became aware of political influences because economists started investigating this topic. To support the incumbent before an election, the Fed had to increase the money supply by more than the voters expected. A possible explanation for the findings by this paper and Milani (2010) is therefore that after 1985 the Fed may have withdrawn from supporting the incumbent because monetary policy would have to be too expansionary to be more than what voters expected.

On the contrary, these results are not consistent with Dentler (2019), who found a preference of the Fed to support an incumbent president with a similar political affiliation over an incumbent president with a different political affiliation. What may explain the difference in results is the time period investigated. Dentler (2019) analysed the period from 1963 to 2017 whereas this paper analysed the period from 1960 to 2008. This means that Dentler (2019) also included the financial crisis in the data. As explained by Blinder (2013), in a financial crisis it is a natural process that the central bank and the government work more closely together. This is the case because it has to save the country from a recession, meaning that reducing inflation is not its only job anymore and its time horizon also gets shorter. This results in the central bank's and the incumbent's time horizons being more alike. This may lead to the Fed being more willing to support an incumbent president, especially if he/she has the same political affiliation as was found in Dentler (2019). After the crisis, the central bank should slowly go back to independence or at least to less political bias but this is a gradual process. So these crisis years and the few years thereafter in the data in Dentler (2019) could have contributed to the difference in treatment of incumbent presidents with similar and different political affiliations in Dentler (2019) and this paper.

Moreover, the effect is not consistent with Abrams and Iossifov, (2006). A reason for this may be that the political affiliation of the president that appointed the Fed chairman matters more than the political affiliation of the Fed chairmen themselves. As was also discussed in Milani (2010), Chappell, McGregor, and Vermilyea (2005) investigated the Federal Open Market

Committee (FOMC) members, who make monetary policy decisions for the Fed. What was stated is that when an incumbent president has the same political affiliation as the president who appointed the FOMC member, this member receives more support from the FOMC member than when the incumbent president has a different political affiliation. Abrams and Iossifov (2006) investigated this relation instead of the political affiliation of the president and the Fed chairman and found that when the incumbent president is from the party of the president that appointed the Fed chairman, the Fed's monetary policy is expansionary before the election. This means that the Federal Funds Rate decreases and the consequence of this is that the economy gets a boost, which increases the re-election chances of the incumbent president. In this paper, however, the political affiliation of the incumbent president and the Fed chairman were compared, and not the political affiliation of the incumbent president and the president that appointed the FOMC members or the Fed chairman, which could be another explanation for the weaker results.

5.3 Limitations

A limitation of this paper is that it is somewhat assumed that there is always increased fiscal spending in the U.S. before gubernatorial and presidential elections. This assumption is partly based on papers that also investigate opportunistic PBCs in other countries than the U.S., where opportunistic PBCs may be stronger. The U.S. is a developed country and an established democracy. The evidence in favour of the existence of the opportunistic PBC is more robust for developing countries than for developed countries (Shi & Svensson, 2006), leading to a lower increase in fiscal spending in developed countries than in developing countries before an election. Moreover, Brender and Drazen (2004) show that there is only a PBC in new democracies and not in established democracies because voters eventually learn from electoral cycles. Similar findings were found by Klomp and De Haan (2013) and Philips (2016). It may therefore be the case that voters know fiscal spending will increase before an election and they do not believe the incumbent to be more capable of running the state or the country because of this anymore. As a consequence, governors and presidents may not increase fiscal spending as much anymore because this is wasteful, decreasing the opportunistic PBC. With this, the need for the Fed to increase the Federal Funds Rate before an election also decreases. This would lead to the absence of a strong effect in this paper.

Another limitation of the analysis in this paper is that the coefficients of the regressions cannot change over the time period from 1960 to 2008. There is a distinction between before and after 1985 made in this paper, but it may be desirable to make more distinctions in the time period. As indicated by Richards (1986), policymakers' decisions may not have been the same in every period. For instance, in the time period studied in this paper, there were supply shocks and the dollar went from fixed to flexible. Policy reactions may change because of this and therefore the coefficients should also change. It would be an idea for future research to make more distinctions in time periods than only the separation of before and after 1985, to make the analysis more accurate.

5.4 Implications

An important finding in this paper is that the Fed is likely to be independent but not politically unbiased to political affiliations in gubernatorial elections. The result of the gubernatorial elections was driven by large states in terms of population. In Crombach et al. (2023), the ECB's monetary policy reaction is less strong for fiscal shocks in small member countries than in large member countries. This implies that these small member countries can spend fiscally more than other non-member countries around elections without their increased fiscal spending being offset by the ECB. This can also be applied to states in the U.S. When only a few small states have a gubernatorial election in a certain year, they can increase their fiscal spending without it being offset by the Fed. This is the case because it is a too small increase in inflation on a country level for the Fed to increase the Federal Funds Rate. However, in that particular state, the increased fiscal spending certainly is beneficial for the incumbent. Large states cannot take advantage of this because their increased fiscal spending would have an influence on the inflation on a country level, leading to the Fed increasing the Federal Funds rate to decrease inflation.

A solution to this problem given by Crombach et al. (2023) is to make sure that member countries have their election dates close to each other. 36 out of 50 gubernatorial elections are already on the same date. However, the remaining 14 are not all in the same year meaning that some small states can benefit from not having elections with a lot of other (large) states. Therefore, it may help to have all 50 gubernatorial elections at the same time to solve this problem. By doing this, the Fed can offset all additional fiscal spending instead of only the fiscal spending of the large states.

6 Conclusion

In this paper, it is investigated how the Fed reacts to opportunistic PBCs in the U.S. caused by both gubernatorial and presidential elections between 1960 and 2008. Time series data were analysed by weighted least squares regressions, which investigated the effect on the Federal Funds Rate of a similar or different political affiliation of the incumbent and the Fed chairman. It was found that the Fed reacts independently to opportunistic PBCs, but that it is not always politically unbiased.

For the gubernatorial elections, there was weak evidence that the Fed increases the Federal Funds Rate when incumbents and the Fed chairman have a different political affiliation, whereas the Federal Funds Rate was neither decreased nor increased when they had the same political affiliation. As a consequence, a state governor with a similar political affiliation as the Fed chairman has a higher re-election chance than a state governor with a different political affiliation. This effect was mainly driven by the 10 states with the largest population and not by the 40 states with the smallest population.

For the presidential elections, there is weak evidence that the Fed decreases the Federal Funds Rate before a presidential election, independent of the political affiliation of the incumbent president, increasing his/her re-election chances. However, this result was too weak and too close to the Taylor rule to conclude that the Fed reacts non-independently.

This paper contributes to the literature that a not yet extensively studied topic is analysed, namely the Fed's monetary policy reaction to opportunistic PBCs caused by gubernatorial elections in the U.S. Although the evidence is only weak, this paper does indicate that it should at least be considered and further investigated that the Fed may react politically biased to gubernatorial elections in the U.S.

7 References

Abrams, B., & Iossifov, P. (2006). Does the Fed Contribute to a Political Business Cycle? *Public Choice*, *129*(3/4), 249-262. https://doi.org/10.1007/s11127-006-9017-0

Aidt, T. S., Veiga, F. J., & Veiga, L. G. (2011). Election results and opportunistic policies: A new test of the rational political business cycle model. *Public Choice*, *148*(1/2), 21-44.

Alesina, A., Cohen, G. D., & Roubini, N. (1993). Electoral business cycle in industrial democracies. *European Journal of Political Economy*, *9*(1), 1-23. https://doi.org/10.1016/0176-2680(93)90027-R

Alesina, A., & Roubini, N. (1992). Political Cycles in OECD Economies. *The Review of Economic Studies*, *59*(4), 663-688. https://doi.org/10.2307/2297992

Beck, N. (1984). Domestic Political Sources of American Monetary Policy: 1955-82. *The Journal of Politics*, *46*(3), 786-817. https://doi.org/10.2307/2130856

Bee, C., & Moulton, S. (2015). Political budget cycles in U.S. municipalities. *Economics of Governance*, *16*(4), 379-403. https://doi.org/10.1007/s10101-015-0171-z

Berry, F. S., & Berry, W. D. (1994). The Politics of Tax Increases in the States. *American Journal of Political Science*, *38*(3), 855-859. https://doi.org/10.2307/2111610

Besley, T., & Case, A. (1995). Incumbent Behavior: Vote-Seeking, Tax-Setting, and Yardstick Competition. *The American Economic Review*, *85*(1), 25-45.

Blinder, A. S. (2013). Financial Crises and Central Bank Independence. *Business Economics*, *48*(3), 163-165.

Bohn, F., & Veiga, F. J. (2021). Political forecast cycles. *European Journal of Political Economy*, *66*, 101934. https://doi.org/10.1016/j.ejpoleco.2020.101934

Boylan, R. T. (2008). Political Distortions in State Forecasts. *Public Choice*, *136*(3/4), 411-427.

Brender, A., & Drazen, A. (2004). *Political Budget Cycles in New versus Established Democracies* (Working Paper Nr. 10539). National Bureau of Economic Research. https://doi.org/10.3386/w10539

Calomiris, C. W. (2019). How to Promote Fed Independence: Perspectives from Political Economy and History. *Journal of Applied Corporate Finance*, *31*(4), 21-42. https://doi.org/10.1111/jacf.12373

Canzoneri, M. B., Cumby, R. E., & Diba, B. T. (2002). *Should the European Central Bank and the Federal Reserve Be Concerned about Fiscal Policy?*

Chang, C., Kim, Y., & Ying, Y. (2009). Economics and politics in the United States: A state-level investigation. *Journal of Economic Policy Reform*, *12*(4), 343-354. https://doi.org/10.1080/17487870903314633

Chappell, J., McGregor, R. R., & Vermilyea, T. A. (2005). Committee Decisions on Monetary Policy: Evidence from Historical Records of the Federal Open Market Committee. *MIT Press Books*, *1*. https://ideas.repec.org//b/mtp/titles/0262033305.html

Clark, W. R., & Arel-Bundock, V. (2013). Independent but Not Indifferent: Partisan Bias in Monetary Policy at the Fed. *Economics & Politics*, *25*(1), 1-26. https://doi.org/10.1111/ecpo.12006

Crombach, L., Bohn, F., & Sturm, J.-E. (2023). *The 'Benefits' of Being Small. Loose Fiscal Policy in the European Monetary Union*.

Dentler, A. (2019). Did the fed raise interest rates before elections? *Public Choice*, *181*(3/4), 239-273. https://doi.org/10.1007/s11127-019-00653-z

Drazen, A., & Eslava, M. (2010). Electoral manipulation via voter-friendly spending: Theory and evidence. *Journal of Development Economics*, *92*(1), 39-52.

Funashima, Y. (2016). The Fed-induced political business cycle: Empirical evidence from a time–frequency view. *Economic Modelling*, *54*, 402-411. https://doi.org/10.1016/j.econmod.2016.01.011

Golden, D. G., & Poterba, J. M. (1980). The Price of Popularity: The Political Business Cycle Reexamined. *American Journal of Political Science*, *24*(4), 696-714. https://doi.org/10.2307/2110954

Grier, K. B. (1987). Presidential Elections and Federal Reserve Policy: An Empirical Test. *Southern Economic Journal*, *54*(2), 475-486. https://doi.org/10.2307/1059330

Haga, M. (2015). On Central Bank Independence and Political Cycles. *Journal of Applied Economics*, *18*(2), 267-295. https://doi.org/10.1016/S1514-0326(15)30012-X

Jones, M., Sanguinetti, P., & Tommasi, M. (2000). Politics, Institutions, and Fiscal Performance in a Federal System: An Analysis of the Argentine Provinces. *Journal of Development Economics*, *61*, 305-333. https://doi.org/10.1016/S0304-3878(00)00059-6

Kim, H., & Kwon, C. (2015). The Effects of Fiscal Consolidation and Welfare Composition of Spending on Electoral Outcomes: Evidence from US Gubernatorial Elections between 1978 and 2006. *New Political Economy*, *20*(2), 228-253. https://doi.org/10.1080/13563467.2014.923822

Klomp, J., & De Haan, J. (2013). Do political budget cycles really exist? *Applied Economics*, *45*(3), 329-341. https://doi.org/10.1080/00036846.2011.599787

Kuper, G. H. (2018). The powers that are: Central bank independence in the Greenspan era. *Empirical Economics*, *54*(2), 485-499. https://doi.org/10.1007/s00181-016-1225-y

MacRae, C. D. (1977). A Political Model of the Business Cycle. *Journal of Political Economy*, *85*(2), 239-263.

Maier, P. (2002). Rhetoric and Action: What are central banks before elections. *Public Choice*, *112*(3/4), 235. https://doi.org/10.1023/A:1019997222044

Milani, F. (2010). Political Business Cycles in the New Keynesian Model. *Economic Inquiry*, *48*(4), 896-915. https://doi.org/10.1111/j.1465-7295.2009.00212.x

Nordhaus, W. D. (1975). The Political Business Cycle. *The Review of Economic Studies*, *42*(2), 169-190. https://doi.org/10.2307/2296528

Peltzman, S. (1992). Voters as Fiscal Conservatives*. *The Quarterly Journal of Economics*, *107*(2), 327-361. https://doi.org/10.2307/2118475

Philips, A. (2016). Seeing the forest through the trees: A meta-analysis of political budget cycles. *Public Choice*, *168*(3/4), 313-341. https://doi.org/10.1007/s11127-016-0364-1

Richards, D. J. (1986). Unanticipated Money and the Political Business Cycle. *Journal of Money, Credit and Banking*, *18*(4), 447-457. https://doi.org/10.2307/1992464

Rogoff, K. (1985). The Optimal Degree of Commitment to an Intermediate Monetary Target. *The Quarterly Journal of Economics*, *100*(4), 1169-1189.

Rogoff, K. (1987). *Equilibrium Political Budget Cycles* (SSRN Scholarly Paper Nr. 977824). https://papers.ssrn.com/abstract=977824

Rogoff, K. (1990). Equilibrium Political Budget Cycles. *American Economic Review*, *80*, 21-36.

Shi, M., & Svensson, J. (2006). Political budget cycles: Do they differ across countries and why? *Journal of Public Economics*, *90*(8-9), 1367-1389. https://doi.org/10.1016/j.jpubeco.2005.09.009

Smith, D. J., & Boettke, P. J. (2015). An Episodic History of Modern Fed Independence. *Independent Review*, *20*(1), 99-120.

Suzuki, M. (1992). Political Business Cycles in the Public Mind. *The American Political Science Review*, *86*(4), 989-996. https://doi.org/10.2307/1964350

Veiga, L. G. (2012). Determinants of the assignment of EU funds to Portuguese municipalities. *Public Choice*, *153*(1), 215-233. https://doi.org/10.1007/s11127-011-9786-y

Veiga, L. G., & Veiga, F. J. (2007). Political Business Cycles at the Municipal Level. *Public Choice*, *131*(1/2), 45-64.