ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Master Thesis Economics and Business

Track: Policy Economics

Quantifying the Plenary Debate: A New Approach to Detect Political Business Cycles?

Name student: Myrthe Manders

Student ID number: 456189

Supervisor: prof. dr. O.H. Swank

Second assessor: dr. J. Delfgaauw

Final version date: 1st of July 2022

The goal of this paper is to explore a new research method for the detection of political business cycles, as previous research shows ambiguous results and the main models used come with many limitations. A unique hand-collected data sample is used that includes transcriptions of plenary debates in the House of Representatives in the Netherlands. The first method used is dictionary-based content analysis, to explore the discussion of expansionary or contractionary policy. It appears that expansionary and contractionary policy words are used more when elections are upcoming, however, mainly contractionary policy words are used more. The second method used is dictionary-based emotion and sentiment analysis. The results show that the proportion of emotion words used increases when elections are upcoming. Also, it appears that the average level of sentiment does not differ in pre-election year debates and regular debates. However, the composition of the sentiment words changes, as the pre-election year debates seem to be more negative. Finally, the coalition-opposition analysis shows that the proportion of emotion words and sentiment words are both higher for the opposition than for the coalition. However, the research method used here still comes with multiple limitations that should be addressed in future research.

Keywords:
Political business cycles, dictionary-based text analysis, content analysis, emotion and sentiment analysis, elections, coalition and opposition, political economics

Table of content

1. Introduction

Only one year ago, in the Netherlands elections were held for the House of Representatives (Tweede Kamer). In addition, the elections for the Municipal Council only took place one month ago. As in every election, politicians strive to obtain as many votes as they can. This can be done through different channels, such as social media campaigns or addressing socially relevant matters in particular. Many Dutch citizens only decide shortly before the election for which political party they are going to vote. ProDemos (2021) shows that for the last elections for the House of Representatives in the Netherlands, 7.8 Million Dutch citizens used the StemWijzer, which is a Dutch online questionnaire that shows, based on twenty theses, which party fits best with an individual's interests. This suggests that the interest in elections and politics is high shortly before elections, indicating that the behaviour of politicians and political parties is magnified as well in times before elections.

One of the channels political parties might use to win votes is by advocating for expansionary fiscal policies. Through expansionary fiscal policies, governments usually strive to obtain falling unemployment levels or increased economic growth in the short run. Nordhaus (1975) is one of the founders of this theory, commonly referred to as *political business cycles*. A political business cycle captures the fluctuation of economic activity that results from an external intervention of politicians and is regularly used to describe the stimulation of the economy in a country short before elections, in order to improve the prospects of the current government getting reelected. However, even though several attempts have been made to prove the existence of political business cycles, empirical evidence of these political business cycles remains ambiguous. One of the reasons for this is probably that the political business cycle models are based on numerous assumptions that are unlikely to hold in practice. For instance, are politicians truly able to influence the inflation rate and make sure it is a certain level just before the elections take place? To analyze whether political business cycles exist in practice, it might be more helpful to focus on the intention of politicians to advocate for expansionary policy, instead of the outcome variables. To do this, a new approach would be needed. In the Netherlands, a place where politicians get to speak and advocate for a certain policy, is in the plenary debates in the House of Representatives. Analyses of the political debates might be a way to prove the existence of political business cycles, or at least the attempts of politicians to introduce expansionary fiscal policies shortly before elections. This leads to the research question:

Can dictionary-based quantitative text analysis be used to detect political business cycles in the House of Representatives in the Netherlands?

The methods that will be used in the attempt to detect political business cycles in the House of Representatives in the Netherlands are dictionary-based content analysis, and dictionary-based emotion and sentiment analysis. Both are types of quantitative text analysis methods that use dictionaries to count words in specific texts. The words in the dictionaries are matched to the transcriptions of the first two

or three plenary debates after Prince's Day every year in the House of Representatives in the Netherlands, over the years 2013 until 2021.

With the dictionary-based content analysis, two word lists are used that contain words that are classified as words that indicate expansionary policy is discussed, and words that are classified as contractionary policy. The results show that, when including three debates per year, expansionary and contractionary policy words are used more in the plenary debates when elections are upcoming compared to the other years. What is surprising, however, is that the average proportion of expansionary policy words is a lot lower in pre-election year debates than in regular years. This suggests that expansionary policy is discussed more when elections are *not* taking place in the next 12 months. This finding is not in line with the political business cycle theory of Nordhaus (1975).

For the dictionary-based emotion and sentiment analysis, an existing dictionary is used that is previously applied in research in political science: the NRC Emotion Lexicon. This dictionary consists of eight categories of emotion words, and two categories of sentiment words. When including two debates per year, the results show that the proportion of emotion words is statistically higher in pre-election year debates than in the regular debates, on average. The proportion of sentiment words per debate per party, minister, or state secretary is not statistically different in pre-election year debates and in regular debates. The composition of the sentiment words, however, does differ. In the pre-election year debates, on average the sentiment is more negative than in the regular years. This is in line with the expectation that the opposition's tone towards the coalition becomes more negative when elections are approaching. The sub-sample analysis where the sample is split into a group of coalition parties and a group of opposition parties confirms this as well. Finally, the coalition and opposition analysis also shows that the proportion of emotion words and the proportion of sentiment words is higher for the opposition than for the coalition, both in pre-election year debates and in regular debates.

The quantitative text analysis methods that are used come with a few limitations. Some of these limitations are standard for dictionary-based text analysis. For instance, dictionary-based text analysis does not take into account the context in which a word is used, as it only matches single words in the texts with single words in the dictionary. Also, the choice of dictionary might bring along problems, as it might omit words that should be classified as expansionary or contractionary policy words, or as a certain emotion or sentiment. These limitations can especially be seen in the dictionary-based content analysis, where the proportion of policy words per debate per party, minister, or state secretary is very low, about 0.20%. This makes it questionable whether the word lists used in this analysis do truly capture the discussion of expansionary or contractionary policy. Also, most dictionaries are made for English language in the first place, and later translated to Dutch through Google Translate. Because of this translation, the meaning of certain words might be changed or Dutch words that do not exist in English are not included in the dictionary.

It is not surprising that multiple limitations are found in the methodology and results of this paper. The main goal is to explore whether quantitative text analysis can be used in the detection of

political business cycles, which has not been researched before. Previous research on political business cycles mainly focuses on existing data on employment, GDP, economic growth, or government expenditures. However, the results of these studies are ambiguous. Also, these studies usually focus on the outcome variables, and not on the *intention* of politicians to execute expansionary fiscal policy short before elections. Therefore, the application of these quantitative text analysis methods into a new area is an important and interesting addition to existing literature on political business cycles. Also, the data sample used in the analyses is unique and a great strength. All data is hand-collected and manually split per party, minister, or state secretary who spoke during the plenary debate in the House of Representatives. This makes it possible to perform analyses on coalition-opposition-level as well, and not only per debate or per year.

Also in practice, the methodology and results of this paper are relevant. It is possible that citizens are not aware of the exact numbers on unemployment or inflation rates, which are the typical variables used in political business cycle analyses. On the other hand, it is possible that citizens do watch interviews or debates with politicians short before the election, or that they see some highlights of these debates in the media. If that is the case, it is interesting to analyze which emotions are used in the speech of politicians, and how the sentiment in the debates changes when elections are approaching.

In the next section, the theory behind political business cycles is discussed to a great extent. Also, the main limitations of existing theories on the political business cycles are presented. Following, the quantitative text analysis methods are explained. Next, the data that is used in the analyses is described. In the results section, the descriptive statistics and unpaired two-sample t-tests are shown for both dictionary-based text analyses. Also, the sample is split into the coalition and opposition parties to show whether there are any differences between those groups. The paper ends with a section discussing the results and forming a conclusion and an answer to the research question.

2. Theoretical framework

In this section, first stabilization policy will be discussed. In this policy, monetary policy instruments are used for stabilization of the economy. This is actually the opposite of political business cycles, in which monetary policy instruments are used to strengthen the business cycles or create its own timing related to upcoming elections. Therefore, next the political business cycle model will be defined as an analytical framework, similar to the model defined by Nordhaus (1975). Following, the main limitations of the model will be discussed. Many important assumptions are made in the model, for which it is questionable that they hold in practice. Many economists already addressed issues regarding the assumptions of the model and amended the model of Nordhaus (1975), however still these empirical papers on political evidence show a lot of mixed evidence, even when the economic, political, or institutional context is taken into account. Therefore, finally a new research method will be introduced that can be used in the future to detect the intention of politicians to generate political business cycles.

2.1 Stabilization policy

Keynes (1937) is among the first economists to argue that the economy of a country can experience a strong and persistent period of stagnation without any natural recovery or correction. Previous economists argued that a process of economic recovery happens naturally, but Keynes disagrees, because of fear and uncertainty faced by consumers, investors, and businesses. This could lead to longer periods of reduced spending by customers and elevated unemployment. To stop this cycle, according to Keynes (1937) changes in policy are required to manipulate aggregate demand. In the Keynesian stabilization policy, demand is stimulated to reduce levels of high unemployment and it is suppressed to counter rising inflation levels. The main policy instruments to change demand are to lower or raise interest rates for borrowers or to increase or decrease government expenditures. Respectively, these are known as monetary policy and fiscal policy.

The goal of stabilization policy is to maintain at a healthy level of economic growth in a country, without strong price changes. Upholding a stabilization policy requires keeping an eye on the business cycle in a country by the government or central bank and adjusting monetary policy instruments when this is necessary. Fiscal policy instruments can be used for this as well. However, the time lag is larger for fiscal policy instruments compared to monetary policy instruments. Therefore, most modern economies use stabilization policies with much of the work being done by the central bank of the country. This is also more in line with the theory of Friedman, who became the main advocate opposing Keynesian government policy measures, and he was not in favor of many government interventions. According to Friedman and Schwartz (1965), there exists a natural unemployment rate and the unemployment below this rate causes inflation to accelerate. Also, he argued that the Philips curve in the long run is vertical at the natural rate of unemployment. He advocated for a macroeconomic point of view, known as Monetarism, and he argued that a small, steady expansion of money supply is a better policy compared to fast and unexpected changes.

Stabilization policy is the opposite of the policy measures that are assumed to be used in political business cycles. Instead of stabilizing the cycles, with political business cycles, one of the main assumptions is that governments use policy instruments to strengthen business cycles or create a timing of the peaks in these cycles that make them look as favorable as possible in order to increase the incumbent's possibility to get reelected (Nordhaus, 1975). Therefore, in the next section the political business cycle and its assumptions are discussed.

2.2 The political business cycle model

Nordhaus (1975) is the first economist to express in an analytical framework the idea that macroeconomic factors can be influenced by political decision-making. Following his theory, governments make decisions driven by their private interests and they only care about being reelected. Therefore, they exploit the short-term Phillips curve, which captures the short-term relation between inflation and unemployment. To increase the incumbent's chance of reelection, the incumbent tries to

increase the inflation rate which in turn leads to a lower unemployment rate short before the election. Because voters care about employment, this should increase the incumbent's probability to get reelected. However, after the election the government is faced with a high inflation rate which makes them implement austerity measures, that in turn increases the unemployment rate again. Thus, unemployment and inflation are subject to cyclical fluctuations that are linked to the election cycles. These fluctuations are called *political business cycles*.

Following, a simplified version of the model introduced by Nordhaus (1975) is shown. The formulas are obtained from the paper by Dubois (2016). To capture political business cycles in an analytical framework, Nordhaus (1975) starts with characterizing the economy using an expectation-augmented Phillips curve:

$$Y_j = \bar{Y} + \gamma(\pi_j - \pi_j^e), \tag{1}$$

where Y_j is the output level in period j, $\bar{Y}$ is the output level in equilibrium, γ is a positive constant, π_j is the inflation rate in period j, and π_j^e is the expected inflation rate for period j. Next, the incumbent has a decreasing chance of reelection when the inflation and unemployment rates are high. This leads to a trade-off, which makes the incumbent minimize the vote function defined as:

$$V_j = -l\left(\tilde{Y} - Y_j\right)^2 - m\pi_j, \tag{2}$$

where $\tilde{Y}$ is the target level of output, l and m are constant parameters that measure discontent with unemployment and inflation, respectively. The government cannot directly control both the inflation rate and unemployment rate, however they attempt to affect the inflation rate indirectly through their decision-making. Therefore, the inflation rate π_j is the action variable of the government which can be interpreted as the inflation level the incumbent would like to see attained.

In the model, Nordhaus (1975) assumes there are two periods, noted as period t and period t + 1. The elections take place at the end of the second period, t + 1. The government also minimizes the intertemporal loss function, in which it is assumed that individuals only have short memory. Thus, at the time of the new elections, the voters already partially forgot the first period t. The intertemporal loss function is defined as:

$$V = \frac{V_t}{1+\rho} + V_{t+1}, \tag{3}$$

where ρ captures to what extent individuals forget the events from the first period t, which is supposed to be larger than 0. When equation (1) and (2) gets combined and one sets $\tilde{Y} - \bar{Y} = \alpha > 0$, one obtains:

$$V_j = -l\left[\alpha - \gamma\left(\pi_t - \pi_j^e\right)\right]^2 - m\pi_j, \quad (4)$$

and then:

$$V = \frac{-l[\alpha-\gamma(\pi_t-\pi_t^e)]^2-m\pi_t}{1+\rho} - l[\alpha - \gamma(\pi_{t+1} - \pi_{t+1}^e)]^2 - m\pi_{t+1}. \quad (5)$$

Nordhaus (1975) assumes that the individuals' expectations are formed in a naïve way. This means that individuals only base their expectations on the previous period, which can be expressed as:

$$\pi_j^e = \pi_{j-1}. \quad (6)$$

Finally, the first-order conditions for the government program can be obtained by incorporating equation (6) in equation (5) and minimizing these with respect to π_t and π_{t+1}:

$$\pi_{t+1} = \pi_t + \frac{\alpha}{\gamma} - \frac{m}{2l\gamma^2} \quad (7)$$

$$\pi_t = \pi_{t-1} + \frac{\alpha}{\gamma} - \frac{m(2+\rho)}{2lv^2} \quad (8)$$

For $\frac{m}{2l\gamma^2} < \frac{\alpha}{\gamma} < \frac{m(2+\rho)}{2l\gamma^2}$, the "classic Nordhaus (1975) result" is found:

$$\pi_t < \pi_{t-1} \; and \; \pi_{t+1} > \pi_t. \quad (9)$$

This shows the cyclicality of inflation related to elections in an analytical framework: inflation is higher short before elections, to boost employment levels. In addition, in the period after elections, the actual inflation level is lower than was expected. Because of declining output, unemployment rises, but this will be forgotten again in the next period (captured by ρ). Therefore, according to the political business cycle theory, periods after elections are recession periods. On the other hand, the actual inflation rate is higher than expected in the period before elections. In that period, output increases, which in turn leads to a lower unemployment level. Therefore, the periods before elections are expansion years. As voters are assumed to be naïve and build their expectations on the previous period only, they are manipulated by the low inflation rate of the pre-election period, captured by π_t, which is lower than π_{t+1} following equation (9).

2.3 Limitations of the Nordhaus' model

Using the model introduced by Nordhaus (1975), it is not surprising that economists find mixed evidence. On one hand, multiple researchers conclude in favor of the theory discussed by Nordhaus (1975), while others do not. This is not unexpected, as the stabilization policy and political business

cycle policy instruments are already direct opposites. But besides that, many assumptions of the political business cycle model are questionable to hold in practice. These problems are related to multiple factors, such as heterogeneity, partisan cycles, rational or naïve expectations, the measurement variables of political business cycles and the constraints of economic policy decision-making.

2.3.1 Heterogenous preferences over inflation and unemployment: partisan cycles

First of all, Nordhaus (1975) assumes that changes in inflation caused by political decision-making effect all voters in a homogenous way. Therefore, he assumes that all politicians have the same preferences over inflation and unemployment. However, in reality different political parties have different ideologies and different target voters. Therefore, decision-making by governments that affect unemployment and inflation is heterogenous. Nordhaus (1975) acknowledges this limitation of his theory as well. As an example, he mentions that in the United States, the Republicans are probably more worried about the inflation rate while the Democrats care more about unemployment levels.

The first economists to categorize economic policy goals with regards to the nature of the political parties are Kirschen et al. (1964). According to them, conservative parties are usually more concerned about price stability, while socialist or labor parties usually focus most on low unemployment levels. This idea is empirically supported by Frey and Schneider (1978a; 1978b), who find evidence for both the United States and the United Kingdom. In addition, Wittman (1977; 1983) analyzes whether policy preferences and private interests of politicians do converge. He finds evidence that this is not the case, which contradicts the theory of Downs (1957), who says that competing political parties are likely to move closer to each other in order to maximize the number of votes they can obtain. Thus, this shows that the ideology of a political party matters when analyzing political business cycles. In turn, it matters on which macroeconomic variables economists focus when they try to detect political business cycles, as factors such as unemployment matter more to socialist parties while conservative parties care more about a stable price level.

2.3.2 Naïve or rational expectations of voters?

In the model by Nordhaus (1975), it is assumed that voters form naïve expectations only based on the previous period. However, in case voters have rational expectations which makes them perfectly able to anticipate government policy, political business cycles cannot exist. In that case, minimizing the loss function shown in equation (2), governments need to set the inflation rate equal to zero for both periods in the model, which makes it impossible to have expansive policy.

Rogoff and Sibert (1988) and Rogoff (1990) combined the model of Nordhaus (1975) with the rational expectations theory quite some time after the publication of Nordhaus. In their papers, voters are assumed to be rational however they do not have complete information about the competence of their government. They observe this with a delay. The authors define competence as the capacity to provide public goods and transfers efficiently. Only when the government hides the harmful

consequences from the voters (i.e., the increasing national budget deficit), when they execute expansionary policy, the government can appear to be competent. Thus, by hiding the harmful consequences and because of the delay, governments create the illusion that their policy is successful until the voters realize it is only beneficial on the short term.

According to Persson and Tabellini (2000), these types of models can be categorized as adverse selection models as the government as an advantage compared to voters concerning the timing of information and their true competence. However, this assumption is relaxed by Lohmann (1998), who assumes both the government and the voters have the same information on the competence of the government. If that holds true, voters do not face an adverse selection problem anymore, but they are faced with a moral hazard problem. In this moral hazard problem, the incumbent can manipulate voters by using policy measures that are not observable for voters, to appear better than the incumbent really is. By taking advantage of this information asymmetry in times of elections, politicians have the possibility to behave similar to the Nordhaus (1975) model. The difference however is that they might not make decisions that affect inflation, but they might use other policy measures. If that would be the case, the political business cycle would still be present, but it will probably not be captured by the model of Nordhaus (1975). However, in practice, it is very unlikely that the assumption that was relaxed by Lohmann (1998) holds.

2.3.3 Economic policy instruments or economic policy outcomes?

The two main variables in the Nordhaus (1975) model, inflation rate and unemployment rate, can in practice not be controlled by the government directly. This is one of the main problems with the assumptions made by Nordhaus (1975). Probably because of this, many empirical studies fail to detect political business cycles when focusing on these two factors. The first economist to address this issue is Tufte (1978), who says that "the economic policy instruments involved must be easy to start-up quickly and must yield clear and immediate economic benefits to a large number of voters" (Tufte 1978, p. 9). For instance, a transfer to households or decrease in taxes to increase disposable income would be a more effective way, as this has fewer timing issues and can be controlled by governments in a more direct way. Thus, to detect political business cycles, economists might need to look at economic policy instruments instead of economic policy outcomes.

Mink and De Haan (2006) look at European countries in the pre- and post-Euro period. They examine whether political business cycles are present in the Euro area using a multivariate model and multiple election indicators. They find evidence that political business cycles are present in the Euro area, as they find an increase in the budget deficit in an election year, but not in the year prior to the election. However, this study comes with two important limitations. Firstly, the sample used by Mink and De Haan (2006) is very small, as it only includes the years 1999-2004. This means that for most countries included in the sample, only one election took place in the sample period. Secondly, the authors use aggregated data only, which does not show when a government only implements

expansionary policy measures focusing on a certain interest group, to win their votes to increase the probability of reelection.

Block (2002) finds comparable results for African countries, focusing on four fiscal and five monetary policy variables to detect political business cycles. However, because of the limited availability of African data on variables such as unemployment levels, it is questionable whether the results can be interpreted as causal. Also, Block (2002) acknowledges that the GDP growth rates in Sub-Saharan Africa are statistically not related to the election cycles in these countries. Finally, it is debatable whether the results found by Block (2002) can be generalized to countries outside Sub-Saharan Africa.

A general drawback of studies that focus on economic policy instruments instead of economic policy outcomes to detect political business cycles, is that the underlying hypothesis is that the government can perfectly control the economic policy instruments. In practice, this hypothesis usually does not hold which makes the findings of these studies less reliable. In addition, even though some evidence of political business cycles is found when economists focus on other variables such as the government's budget deficit, it is not known whether these policy measures truly have an effect on the unemployment level or inflation rate as is used by Nordhaus (1975) in the model. Therefore, even focusing on economic policy instruments instead of the outcome variables is not a solution to all the problems that are found in the existing political business cycle literature.

2.3.4 Constraints on economic policy

In the model of Nordhaus (1975), one of the main assumptions is that governments can pick a certain inflation rate themselves, that decreases the unemployment rates, so it makes them look favorable and increases the incumbent's probability to get reelected. However, in practice, monetary policy measures are not solely proposed by politicians. For instance, when central banks have the highest authority to set monetary policy, it would be hard for politicians to generate political business cycles following the model of Nordhaus (1975). Multiple economists find evidence for this, amongst them Alpanda and Honig (2009), who analyze to what extent monetary policy is manipulated for political purposes during elections. They do not find evidence for political monetary cycles in advanced countries or developing nations who have an independent central bank. For countries that do not have an independent central bank, they do find evidence of political monetary cycles. Also, they also find that these cycles are not caused by fiscal expansions related to elections. Therefore, this might mean that politicians pressure central banks to exploit the Phillips curve, which causes these political monetary cycles. Thus, this suggests that the independence of the central bank influences the constrains politicians have on economic policy, which in turn limits the possibility for politicians to generate political business cycles.

Following, other monetary institutions might impact the magnitude of political business cycles as well. One common field of research is on foreign exchange regimes. Hallerberg et al. (2002) discuss political business cycles in Eastern European countries, using a model focusing on the exchange rate regime of the country. They find that the type of exchange rate regime and the country's relative

independence of their central bank does affect the policy instruments used by governments to influence the country's economy short before new elections. If there is a fixed exchange rate regime in the country, their government is more likely to use fiscal expansionary policy instruments before elections, while when there is a flexible exchange rate regime in the country, the government is more likely to use monetary expansionary policy instruments before elections. However, as discussed in the previous paragraph, monetary expansionary policy instruments might be harder to use when a country has an independent central bank who has the monetary authority. But, the use of fiscal policy instruments might be constrained as well, such as balanced budget requirements (Schneider, 2010) or delegation to a strong Minister of Finance (Clark and Hallerberg, 2000).

Taking it one step further, it can be discussed that there are so many factors influencing the inflation rate of a country that it is hard to believe that politicians have any influence on the inflation rate, and in turn the unemployment rate, at all. For instance in the Netherlands, the inflation rate in March 2022 was 9.7 percent higher than the inflation rate in March 2021 (CBS, 2022). The inflation in March was the highest since May 1976. The main reason for this high level of inflation is due increased energy prices which in turn increase the prices of motor fuels, food, and other products. Thinking about this rationally, this high level of inflation is not caused by decisions made in the House of Representatives, but by the war in Ukraine and Russia.

2.3.5 Timing

In the model, Nordhaus (1975) assumes that there are only two periods, and the elections take place at the end of the second period. Another assumption that is made is that individuals only have short memory. This means that at the time of a new election, voters already forgot the decisions made by politicians in the first period. However, in practice, also these assumptions are unlikely to hold, as both monetary and fiscal policy instruments come with a time lag.

Firstly, the timing problems with monetary policy instruments are strongly related to the independence of a central bank in a country (Alpanda and Honig, 2009). When the independence of a central bank is high, it is harder for politicians to influence the interest rate and in turn the inflation rate and unemployment rate in the country. Even when they can influence the central bank to increase or decrease the interest rate, this takes time. In addition, it takes time before the policy leads to an increase or decrease in the unemployment rates, which probably is of more importance for voters compared to the interest rate or inflation rate.

Following, the timing problems with fiscal policy instruments are more related to the institutional context in the country. Nordhaus et al. (1989) acknowledge this problem as well, as they argue that the politically important action is that the funding of a government action gets approved, but that the actual government expenditure can take place some time after the election. In the Netherlands, when the House of Representatives proposes a new fiscal policy measure such as a tax increase or decrease, this also needs to be approved by the Senate (Eerste Kamer) which takes time as well. In

addition, just as is the case with monetary policy instruments, it takes time for fiscal policy measures to affect the inflation rate and in turn the unemployment rate in a country. These time lags make it questionable whether the main assumption of the model of Nordhaus (1975) actually holds: are politicians able to influence and time expansionary policy measures such that there is economic growth and a low unemployment level just before the elections?

Taking together all limitations discussed so far, it becomes questionable to assume that the model of Nordhaus (1975) is able to truly detect political business cycles, and a new approach seems needed. But even besides the main limitations of the model by Nordhaus (1975), the context is important for political business cycles to be detected or to be able to exist. First, the economic and political context determine the magnitude of political business cycles. Secondly, the institutional context is important. More in particular, the electoral calendar, system, regime and rule are important institutional factors. These contextual factors are discussed in the next section.

2.4 The economic and political context

Nordhaus (1975) does not take into account under which circumstances an election takes place. However, many economists argue that the context of elections matter as well as this can influence the political business cycles. If the economic conditions are good, for instance the level of unemployment is low, the incentive for the incumbent to advocate for expansionary policy might be smaller (Dinkel, 1981). In addition, the political climate and the popularity of the government might matter as well.

To detect political business cycles, it matters whether the level of electoral competitiveness is high enough. The incentive to advocate for expansionary policy short before elections by the incumbent to increase the probability to get reelected is low when the election is not competitive. In that case, a political business cycle will not be observed. However, empirical evidence is ambiguous. On one hand, Baber and Sen (1986) and Clingermayer and Wood (1995) find that the level of government debt is higher short before elections in countries or states where the electoral competitiveness is high, compared to regions with a low level of electoral competitiveness. However, Chaudhuri and Dasgupta (2005) and Schneider (2010) reject this effect.

Following, the popularity of the government might matter to detect political business cycles. To control for the level of popularity of a government, Schultz (1995) includes a dummy variable in his analysis for political business cycles. The popularity of the government is measured as the difference between the incumbent party and the main opposition party. Schultz (1995) finds no statistically significant results for the unconditional electoral dummy and permanent popularity lead. However, the product of both variables is found to be statistically significant, which suggests that the level of popularity of the government drives the results of elections to a certain extent.

Besides electoral competitiveness and the popularity of the government, the nature of a political party might affect political business cycles. This argument is closely related to the partisan cycles discussed before. For the United States, Swank and Swank (1993) show that the Republican party is

more likely to strive for a decrease in tax rates short before elections, while the Democratic party is more concerned with unemployment and inflation levels. If that holds true, this suggests that political business cycles are more likely to be detected using the model of Nordhaus (1975), when the Democrats are the incumbents short before elections.

2.5 Institutional context

2.5.1 The electoral calendar

Nordhaus (1975) already made a suggestion to decrease the possibility for governments to implement expansionary policy to manipulate voters. He suggests that reducing the length of terms in office or decrease the number of times the incumbent can get reelected will also reduce the government's possibility to impose these expansionary policy measures, which in turn will no longer lead to political business cycles. Lindbeck (1976) makes the suggestion to choose the date of elections at random, so that the government cannot anticipate on these elections and therefore also not generate political business cycles. However, this solution will not work in a democratic system. In addition, when there is a fall of the government, there is also a change in the expected date of the new elections. However, no empirical evidence shows whether this affects political business cycles.

Another problem with the model of Nordhaus (1975) is the assumption that the electoral calendar is exogenous. This assumption does not hold in all countries. For instance, in the United Kingdom, the government can choose themselves when to organize the new elections (UK Parliament, 2022). Even though some conditions have to be met, such as that elections in the United Kingdom still need to take place within five years, the elections can be seen as endogenous. This can have serious consequences when using the model of Nordhaus (1975). Instead of generating an economic cycle at the moment of elections, the government can call for elections in a period with a booming economy. In this case, the political cycle is following the economic cycle, instead of the reverse.

2.5.2 System, regime and rule

Another important factor that affects the probability of observing political business cycles is the political system in a country. This argument is related to the electoral competitiveness as well. For instance, in a country with a non-democratic system, where the incumbent is the only candidate, and the chance of losing power is nearly zero, the incumbent has no incentive to advocate for expansionary policy (Block et al., 2003). However, even in countries with a non-democratic system evidence of political business cycles is found, such as for China (Guo, 2009) and Egypt (Blaydes, 2011). The reason for expansionary policy in periods short before elections is that, even though the political leaders do not face a lot of competition, they need to remain sufficiently popular, to avoid contestation.

Block et al. (2003) argue that in countries with a multiparty system, the incentive to advocate for expansionary policy measures short before elections is the largest. Because electoral competitiveness is usually higher in a multiparty system, the incumbent has a larger incentive to win votes compared to

a authoritarian system with one political leader. Also, Brender and Drazen (2005) find that political business cycles are more distinct in new democracies as there is a lack of experience with elections, or a lack of information on available voters, or both. However, Barberia and Avelino (2011) reject this finding for countries in Latin America with a new democratic system.

Following, the electoral rule in a country matters as well in order to detect political business cycles. According to Persson and Tabellini (2003), majoritarian elections can be associated with stronger personal accountability of politicians compared to proportional elections, where politicians collectively are more accountable. In turn, proportional elections give a stronger incentive to politicians to advocate for broad policy programs, such as increased welfare state spending. On the other hand, majoritarian elections incentivize politicians more to focus on target spending on specific geographical areas, to convince swing voters in certain areas. Therefore, stronger political business cycles can be expected to be observed in countries with a proportional electoral rule. But on the other hand, as individual political accountability gives a greater incentive to manipulate, stronger political business cycles can be expected under presidential regimes as the decision-making process involves fewer individuals. In that case, stronger political business cycles can be expected in countries with a majoritarian election rule.

2.6 Targeting economic policy

One other assumption of the model of Nordhaus (1975) is that voters are naïve and base their current expectations on the inflation rate of the previous period. However, in practice, it is extremely unlikely that voters only base their expectations and in turn their vote on the inflation level and unemployment level in a country. Firstly, many individuals do not know the exact inflation rate and level of unemployment in a country short before the elections. Secondly, there are multiple other subjects that are considered as more important by many voters, such as climate or education. Therefore, it would be more plausible if politicians focus on these more visible and known subjects, to win votes.

In addition, because of multiple limitations of the model and contextual constraints discussed so far, it is extremely difficult for politicians to pursue expansionary fiscal or monetary policy measures to increase their probability to get reelected. As a solution, they might focus more on target voters and therefore focus more on target spending which is directly visible for voters. For instance, Remmer (2007) examines the expenditures at the province-level in Argentine. In particular, they focus on the provision of public goods. They find that the provision of public goods by politicians fluctuates with electoral cycles and partisanship. Gamez and Ibarra-Yunez (2007) find similar results for public goods provision at the subnational level in Mexico. However, one problem with these studies is that they focus on the subnational level instead of national politics. Therefore, based on these studies, it cannot be said that politicians participating at the national level also focus on target spending.

Other studies focus on detecting political business cycles in specific spending components to discriminate those voters that are privileged by the incumbent. For instance, Brender and Drazen (2013) focus on the relation between elections and changes in the composition of government expenditures.

They find no significant effect that the replacement of political leaders changes the composition of the government expenditures on the short run. On the medium term, changes in leadership are associated with larger changes in the composition of government expenditures, but they only find this for developed countries. If these results can be interpreted as causal, this suggests that there is a time lag in the changes in the composition of government expenditures, thus that an election does not directly change the government spending when a new leader is elected. This makes it more difficult to detect political business cycles as well.

In addition, Vergne (2009) examines the visibility of government spending in periods short before elections compared to other periods. Using a sample including 42 developing countries from 1975 to 2001, he finds that the government spending in an election year shifts more to expenditures that are visible on the short run, such as wages and subsidies. On the other hand, he finds a decrease in capital expenditures. However, this finding does not hold in all research. For instance, Van Dalen and Swank (1996) show that for the Netherlands, there is an increase in government spending on both visible goods as well as goods with a low media outline.

However, with these studies the same problem holds as when economists choose to focus on economic policy instruments instead of economic policy outcomes. It still cannot be confirmed that these policy instruments truly affect macroeconomic factors such as the inflation rate or the unemployment level.

2.7 Future research

The model introduced by Nordhaus (1975) comes with many caveats that make it hard to detect political business cycles in practice. Even though many economists have adjusted the model for some of its problems, the perfect method to detect political business cycles empirically does not seem to be found yet. In fact, it might even lead to the discussion whether political business cycles actually can exist. Therefore, a new approach is needed that does not face the same problems the model of Nordhaus (1975) already faced, as these problems are still not solved. Therefore, the new approach should be something that can be influenced by politicians but can also be observed by voters. Following the Nordhaus model (1975), in practice the inflation rate and in turn the level of unemployment are very unlikely to be directly influenced by politicians, and also not likely to be observed and remembered by voters.

The main issues with political business cycles are whether politicians can truly implement certain policy measures to boost the economy and control the timing of these policy measures. Therefore, it would be a useful way to approach the political business cycles as the *intent* of politicians to implement such measures to boost the economy short before elections. In that approach, the assumption that politicians can influence the inflation rate does not need to hold. Therefore, it is not relevant anymore to look at economic outcome variables such as unemployment rates or wages, but it becomes relevant to examine the behavior of politicians shortly before elections compared to other periods. In addition, it is more likely that voters look at the behavior of politicians instead of monetary

of fiscal policy measures that were introduced by politicians a longer time ago. If there is a political business cycle present, it should hold true that the incumbent is *advocating* for expansionary policy measures short before the elections, however as now the intent of political business cycles is of interest, it is not relevant anymore if and when these expansionary policy measures are truly executed. In that way, politicians aim to win votes through communicating that they are in favor of certain expansionary policy measures. This might be enough for politicians to win votes, as citizens not necessarily check the unemployment or inflation rates, but they might pay attention to statements made by politicians.

One of the channels voters learn about the behaviour of politicians, is through media. In turn, media channels often follow what is being said by politicians during debates, as there politicians clearly show which policy measures they support and to which they oppose. Therefore, analyses of political debates might be a way to prove the existence of political business cycles, or at least the attempts of politicians to introduce expansionary policies shortly before elections.

3. Methodology

The new method to detect political business cycles will include quantitative text analysis, which will be performed in two steps. First, content analysis is used to compare whether expansionary policy or contractionary policy gets discussed more often in the debates directly after Prince's Day when new elections for the House of Representatives are upcoming, compared to other years. Second, emotion and sentiment analysis is performed to analyze the tone in the House of Representatives during the plenary debates. In both analyses, the content or tone in the period of interest, so in the three debates after Prince's Day when a House of Representatives election is approaching, is compared to the content or tone in the control period, which includes the three debates after Prince's Day in regular years.

3.1 Content analysis

The first measure used to analyze the plenary debate in the House of Representatives, is content analysis. It is of interest to know whether the topics discussed in the plenary debate during the debates immediately after Prince's Day in pre-election years are different from the topics in the other years. In particular, the aim is to explore whether expansionary or contractionary policy is discussed more in pre-election year debates compared to the other debates. The assumption is made that topics related to the Dutch State Budget (Miljoenennota) are discussed in the plenary debate in all years. Following the political business cycle theory from Nordhaus (1975), it should be expected that expansionary fiscal policy is discussed to a greater extent in the Miljoenennota debates when a House of Representatives election is upcoming, compared to the debates in other years. A clear example of the incumbent advocating for expansionary policy in the debate in the House of Representatives can be seen in the plenary debate on 21st of September 2016, by Diederik Samson from the Partij van de Arbeid, who were a part of the coalition at that time. Only a few months before the election, he reflects on what the coalition has achieved and still wants to achieve, in his opinion, as he says:

"Van de snelst stijgende naar de snelst dalende werkloosheid: is dat stilstand? Het wiskundige midden is inderdaad nul, maar voor de wereld is het echt een groot verschil. Ons doel was meer dan herstel alleen. Wij wilden herstel ook koppelen aan rechtvaardigheid. Worstelend met een economische crisis is dat allerminst vanzelfsprekend, zo laten de landen om ons heen elke dag zien. Maar hier lukte het dus wel. Inkomensverschillen worden kleiner. Bonussen worden beperkt met de strengste wetgeving van Europa. Publieke investeringen, zoals in het onderwijs, zijn toegenomen. De strijd tegen de doorgeslagen flexibiliteit op de arbeidsmarkt is opgevoerd. Belastingontwijking wordt steviger aangepakt, grote vermogens worden zwaarder belast en schoonmakers krijgen weer een vast contract bij de overheid. Stap voor stap voor stap richting een rechtvaardiger samenleving. Deze begroting zet deze lijn ook door. We vragen opnieuw om een bijdrage van de hogere inkomens om ouderen en mensen op het minimum wat meer koopkracht te geven. De Partij van de Arbeid is vooral erg verheugd met de 100 miljoen om armoede onder kinderen te bestrijden. We sporen het kabinet hierbij aan om alles op alles te zetten om de ambitie dat het ook ieder kind bereikt waar te maken, om ieder kind de kans te geven om mee te doen. Dat geldt ook voor de investeringen in het onderwijs. Wat ons betreft worden die vooral ingezet voor het bestrijden van ongelijkheid".[1]

This speech shows that the Partij van de Arbeid, or the coalition, wants to increase government spending, to increase the purchasing power and to decrease unemployment levels. Also, it clearly shows the Partij van de Arbeid wants less inequality and poverty, especially amongst children. On the other hand, a clear example of the discussion of contractionary policy in a debate that takes place shortly after elections were held, can be found in the debate of the 18th of September 2013. According to the political business cycle theory of Nordhaus (1975), elections are followed by a recession because the expansionary policy measures have to be compensated for after the elections. This clearly shows in this debate, where Carola Schouten of the ChristenUnie, who are in the opposition, says:

"Tot de slot de reden van dit wetsvoorstel. Het kabinet is hier duidelijk over. Het beperken van de partnertoeslag is gewoon een bezuinigingsmaatregel. Ik snap dat er keuzes gemaakt moeten worden in deze tijd van crisis. Ook wij ontkomen niet aan die moeilijke keuzes. Maar dan is het wel de vraag of een maatregel die je neemt redelijk en proportioneel is. Voor mijn fractie staat het nog niet vast dat daar hier sprake van is. De betrouwbaarheid van de overheid, de invoeringstermijn, de consequenties bij het verlies van een baan en de communicatie over deze maatregel wegen zwaar voor ons. De staatssecretaris moet dan ook met heel goede antwoorden komen, want op dit moment zijn wij nog niet overtuigd".[2]

[1] Retrieved from: https://www.tweedekamer.nl/kamerstukken/plenaire_verslagen/detail/2016-2017/2
[2] Retrieved from: https://www.tweedekamer.nl/kamerstukken/plenaire_verslagen/detail/2013-2014/2

This speech shows that cuts need to be made in the government expenditures, in only half a year after the elections for the House of Representatives took place. This part also shows the lack of trust by the opposition in the coalition.

The method to measure the topics discussed in the plenary debates is dictionary-based quantitative text analysis, which is more reliable but might also come with lower validity, compared to hand-coding. When using this method, it is required to construct a dictionary that includes words that indicate expansionary or contractionary policy, as no such dictionary already exists, especially not for the Dutch language. The word lists created for the dictionary-based content analysis are presented in Appendix A, Table A1.

How the dictionary-based content analysis works, is that it is possible to calculate how often certain words come up in a specific text. For instance, if one of the plenary debates in the House of Representatives is focused on climate change, words such as "klimaat" or "opwarming" probably are commonly used, which leads to a relatively high score for "environment", which includes words such as "klimaat" and "opwarming". For expansionary or contractionary policy, this is a little less straightforward. However, words such as "inflatie", "btw-verlaging" or "loonsverhoging" might be indicators of expansionary policy. Also, words such as "investeringen" are included in the expansionary policy word list, and this word also comes back in the speech of Diederik Samson of the Partij van de Arbeid shown above. On the other hand, words such as "deflatie", "bezuinigingen" or "belastingstijging" might be indicators of contractionary policy (Appendix A, Table A1). The words "crisis" and "bezuinigingsmaatregel" are also included in the contractionary policy word list, and these words come back in the speech of Carola Schouten of the ChristenUnie, presented above.

Through this type of analysis, it is possible to measure in a quantitative way which topics are discussed in plenary debates. However, to make the dictionary relevant for the research question, only topics related to political business cycles should be included in the dictionary. Mainly because of the limited data available, no hypothesis can formally be tested. Nevertheless, for clarity, hypotheses will be presented to support the research question. The first hypothesis is:

H1: Expansionary fiscal policy gets discussed more during the plenary debates in the House of Representatives in the Netherlands when elections are approaching, compared to other years

Following, according to the political business cycle theory, in particular incumbent governments try to boost economic growth or decrease unemployment levels short before elections in order to increase their chances to get reelected (Nordhaus, 1975). This can actually also be seen in the speech by Diederik Samson from the coalition and the speech of Carola Schouten of the opposition presented above. If this would be true in general, it makes sense to assume that in particular parties from the coalition are advocating for expansionary fiscal policy during the plenary debates, compared to politicians from the opposition. This leads to the second hypothesis:

H2: The extent to which expansionary policy gets discussed differs between the coalition and opposition in the House of Representatives when elections are approaching, compared to other years

3.2 Emotion and sentiment analysis

After the content analysis, the tone used per political party in the plenary debates of the House of Representatives will be measured using emotion and sentiment analysis. To measure emotion or sentiment in a text or speech, dictionary-based emotion and sentiment analysis can be used. However, when measuring this, another dictionary is required compared to the dictionary used for content analysis. In this analysis, a classification of words is required that classifies words as for instance positive, negative, or offensive. There are already existing dictionaries measuring tone or sentiment. The problem with many dictionaries is, however, that they can only be applied on English texts.

One of the emotion and sentiment dictionaries that can be applied on Dutch texts is the NRC Emotion Lexicon (Mohammad et al., 2013). The NRC Emotion Lexicon is previously used in the field of politics as well, for instance to predict the results of elections, to track political views, and to detect the consistencies and inconsistencies between actions of the government and their statements (Alessia et al., 2015). Therefore, the NRC Emotion Lexicon seems a proper fit for the dictionary-based sentiment analysis in this context as well.

Schwalbach (2022) finds an increase in the negative tone in speech by politicians from the parties in the opposition, which suggests an increase in the overall level of sentiment in debates in parliament. Therefore, the expectation is that the tone in the plenary debates in the House of Representatives as well becomes harsher, or maybe on the other hand more supportive, the expectation is that the overall level of sentiment rises in the weeks prior to elections compared to the control period. This leads to the third hypothesis:

H3: The level of emotion or sentiment per party in the plenary debates in the House of Representatives in the weeks after Prince's Day differs when elections are approaching, compared to other years

For the third hypothesis, again analyses on multiple levels are performed. First, it will be measured whether the overall tone per party, minister or state secretary is different in pre-election year debates compared to the other years. Secondly, the data is aggregated for coalition parties and opposition parties, to compare the sentiment amongst the coalition and opposition in the plenary debates.

4. Data

4.1 House of Representatives: transcriptions

For the quantitative text analyses, a unique data set is used that includes the transcriptions of the plenary debates in the House of Representatives, which are hand-collected. These reports are daily transcriptions of the plenary debate that took place on that date. These texts can be expected to clearly show which

topics are discussed in the debates, but also to reflect the overall level of emotion or sentiment in the House of Representatives, as they are direct transcriptions of the politicians who spoke in the House of Representatives. The transcriptions are retrieved from the website of the House of Representatives in the Netherlands. The transcriptions per debate are then manually split into each party, minister or state secretary who spoke during the plenary debate. The parties included per year are presented in Table 1. The parties in the coalition are marked green in the table, the parties in the opposition are marked red. When the blocks are colored white, that party did not have any seats in the House of Representatives in September in the belonging year. The ministers that spoke during the three debates after Prince's Day are included in Table A2 and the state secretaries are presented in Table A3 in Appendix A.

Table 1

Parties in the House of Representatives from 2013 until 2021

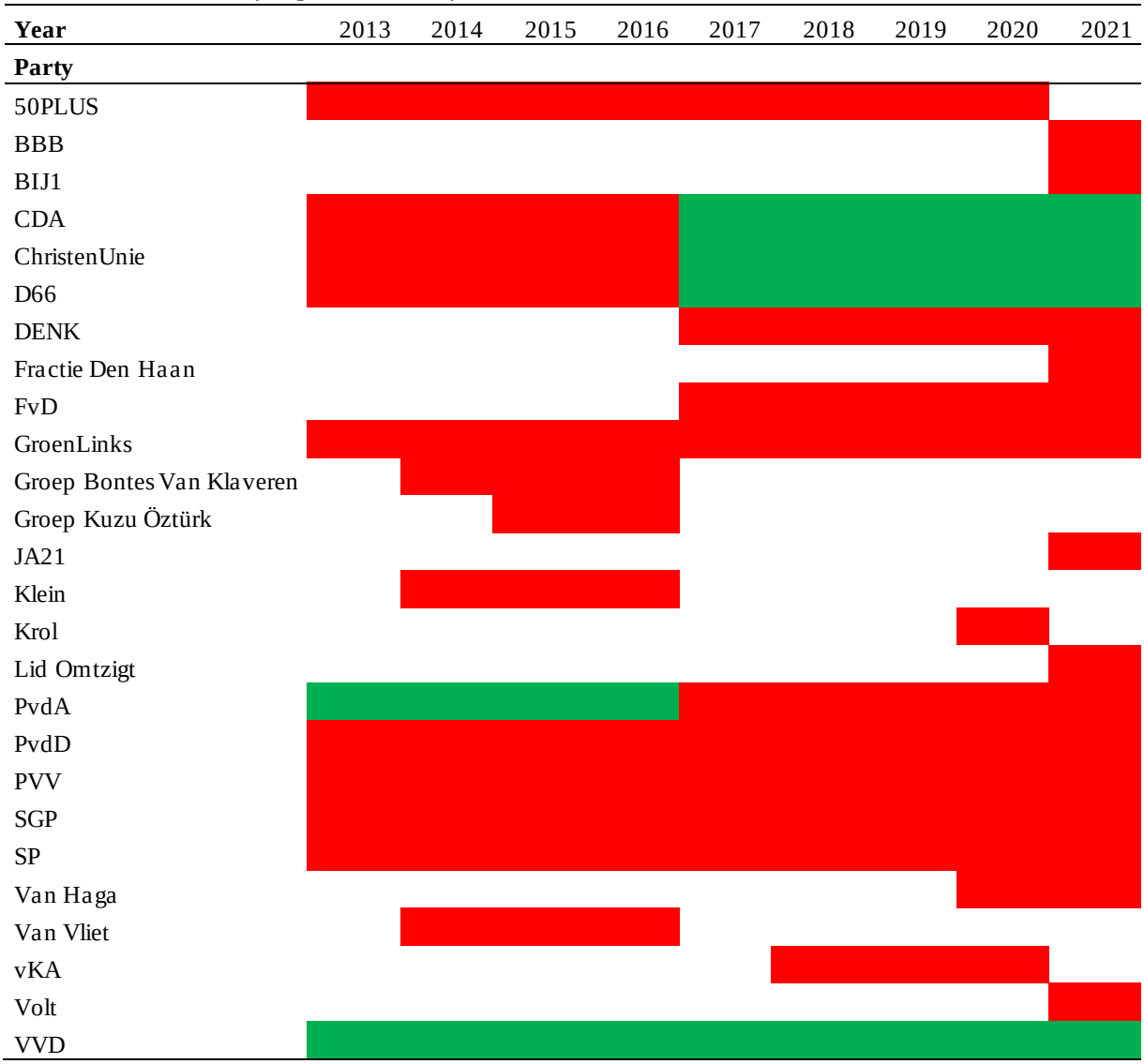

Table 1 shows which parties are included in the sample, looking at September of each year. The parties that are marked green were in the coalition during that year. The parties that are marked red were in the opposition during that year. When the blocks are colored white, that party did not have any seats in September in the belonging year. There was a demissionary cabinet in September 2021, even though elections were held in March 2021.

4.2 Time period

The time period include will be from 2013 until 2021. For these years, the three plenary debates directly after Prince's Day will be included. The debate on Prince's Day itself will not be included, as this is only a short debate in which the Minister of Finance officially received the Miljoenennota. As all these debates after Prince's Day focus on the Miljoenennota, the assumption is made that the focus of these debates is somewhat similar every year. The debates of interest are the plenary debates in the months before the elections of the House of Representatives. For instance, for the election in March 2017, the debates of interest took place in September 2016. The control group will include the plenary debates in September when there was no election held in the upcoming 12 months.

One problem is that the first report dates from the 25th of June 2013. The elections of the House of Representatives took place in 2021, 2017, 2012, and earlier. This means that it is only possible to look at two elections for the House of Representatives, which leads to a very small sample. Therefore, no causal effects will be tested or proved in this paper. The main goal of the research will be to explore whether quantitative text analysis can be an approach to detect political business cycles, but this methodology will need to be explored further in the future in case any significant results will be found.

5. Results

In this section, the results of the two methods are discussed. First, the content analysis is used to check whether expansionary policy or contractionary policy is discussed to a greater extent in the plenary debates in the House of Representatives in pre-election year debates compared to the other years. Next, emotion and sentiment analysis is performed to check whether the tone in the plenary debates differs in pre-election year debates compared to the regular debates.

5.1 Content analysis

In this section, the results are presented on the content analysis of the plenary debates in the House of Representatives in the Netherlands. The content of the first two or three debates per year after Prince's Day are included and analyzed using dictionary-based quantitative text analysis. It is explored whether expansionary or contractionary policy is discussed more in the pre-election debates compared to regular debates. To perform this analysis, a dictionary is required. Actually, two word lists are created: one with words indicating expansionary policy is discussed, and one with words indicating contractionary policy is discussed. The dictionary-based content analysis counts the number of expansionary policy words and the number of contractionary policy words per text. The word lists created are presented in Table A1 in Appendix A. In this section, first the descriptive statistics are discussed. Next, unpaired two-sample t-tests are performed to test whether the debates differ in pre-election and regular years. Finally, sub-sample analysis is performed for a sub-sample including all coalition parties and another sub-sample including all opposition parties.

5.1.1 Descriptive statistics

The descriptive statistics are presented in Table 2 below. To obtain these numbers, dictionary-based content analysis is performed using the word lists in Table A1 in Appendix A. Panel A of Table 2 shows the descriptive statistics of the total combined sample. This means that there is not made a subset with election or non-election years, or with coalition or opposition parties. Panel B shows the descriptive statistics of the debates in September 2016 and September 2020, which took place some months before the elections of March 2017 and March 2021, respectively. Panel C shows the descriptive statistics of the debates in September in all other years, thus that were not prior to elections of the House of Representatives. For each year, the first three debates that took place in the House of Representatives after Prince's Day are included in the sample. In the first two debates, the Miljoenennota which was presented on Prince's Day is discussed. In the third debate, the main focus is on questions that can be asked to all minsters and state secretaries by the members of the House of Representatives.

The variable *Election* is a dummy variable that equals zero when the debates are not prior to the new elections. When the debates take place less than 12 months before the new elections, the dummy equals one. This is the case for the debates in September 2016 and September 2020. The variable *TotalWords* counts the number of words spoken per party, minister, or state secretary, per debate. Thus, this does not measure the total words spoken on a certain day, but this is split into groups. The variable *UniqueWords* measures the total number of unique words used by a party, minister, or state secretary, in each debate. The variable *LexDiv* measures the lexical diversity in a text. This is calculated as the total number of unique words per debate divided by the total number of words of the debate.

There are three variables of interest created with the data sample. The variable *PolicyWords* counts the total number of expansionary and contractionary policy words that are matched with the dictionary in Table A1 in Appendix A. Again, these are on the party-, minister or state secretary-level and counted per debate. The variable *PropExpansionary* is calculated as the number of expansionary policy words divided by the total number of *PolicyWords* per debate, again per party, minister, or state secretary. The variable *PropContractionary* is similar to the variable *PropExpansionary* but uses the number of contractionary policy words. All variables are also defined in Table A4 in Appendix A.

The descriptive statistics show that the total number of words and the number of unique words are a little higher on average in pre-election debates compared to the other debates. The lexical diversity on the other hand is quite similar in the pre-election year debates and the other debates. What does stand out, however, is that the mean of the number of policy words, and also the average proportions of expansionary and contractionary words, are very different in Panel B and Panel C of Table 2. This suggests that there is indeed a difference in the discussion of expansionary and contractionary policy between election and non-elections year debates. However, the expectation was that expansionary policy is discussed more in pre-election years than in regular years. Table 2 shows the opposite, as the average proportion of expansionary policy words is higher in Panel C than in Panel B, 37.7% compared to 61.3% respectively. This does not support hypothesis 1. However, the total number of policy words is higher

Table 2

Descriptive statistics: three debates per year

Panel A: Full sample

Variables	N	Mean	St. Dev.	Min	Max
TotalWords	466	4,421.951	6,288.504	1	55,004
UniqueWords	466	921.326	723.966	1	5,371
LexDiv	466	0.318	0.147	0.098	1.000
PolicyWords	466	8.678	18.976	0	217
PropExpansionary	325	0.557	0.350	0.000	1.000
PropContractionary	325	0.443	0.350	0.000	1.000
Panel B: Election = 1					
TotalWords	105	4,891.381	7,004.933	13	47,877
UniqueWords	105	975.810	783.375	12	4,821
LexDiv	105	0.313	0.151	0.101	0.923
PolicyWords	105	11.438	25.229	0	217
PropExpansionary	77	0.377	0.313	0.000	1.000
PropContractionary	77	0.623	0.313	0.000	1.000
Panel C: Election = 0					
TotalWords	361	4,285.413	5,987.551	1	55,004
UniqueWords	361	905.479	706.112	1	5,371
LexDiv	361	0.320	0.146	0.098	1.000
PolicyWords	361	7.875	16.685	0	157
PropExpansionary	248	0.613	0.342	0.000	1.000
PropContractionary	248	0.387	0.342	0.000	1.000

Table 2 shows the descriptive statistics of the text variables used in the dictionary-based content analysis including the first three debates after Prince's Day every year. Panel A shows the descriptive statistics for the full sample, Panel B shows the descriptive statistics for all pre-election year debates (Election = 1), and Panel C shows the descriptive statistics for all other debates (Election = 0). The variables are defined in Appendix A, Table A4.

in Panel B, thus in election-year debates, which can mean that the total number of expansionary policy words in election-year debates might be higher compared to non-election year debates.

Following, a sub-sample is created that only includes the first two debates that took place after Prince's Day in the House of Representatives are included. The main reason for this is that in all those debates, the Miljoenennota is discussed, while this is not necessarily discussed in the third debate after Prince's Day each year. In addition, in the first two debates following Prince's Day, all parties speak more than a few words or sentences in the House of Representatives, while in the third debate some small parties only say a few words. The descriptive statistics of the sub-sample including only the first two debates after Prince's Day each year are presented in Table 3.

When comparing the full sample in Table 2 with the sub-sample in Table 3, it immediately shows that the minimum number of total words spoken per party, minister or state secretary per debate is higher in Table 3 than in Table 2, 41 words compared to 1 word, respectively. But what stands out even more is the average number of total words spoken per party, minister, or state secretary per debate. In Table 2, this number is only 4,421.951 words while in Table 3 the average is 5,838.053. This suggests that during the first two debates after Prince's Day, each party, minister, or state secretary speaks more than in the third debate. The lexical diversity, however, decreased when excluding the third debates,

Table 3

Descriptive statistics: two debates per year

Panel A: Full sample

Variables	N	Mean	St. Dev.	Min	Max
TotalWords	285	5,838.053	7,337.006	41	55,004
UniqueWords	285	1,145.211	786.498	36	5,371
LexDiv	285	0.279	0.116	0.098	0.878
PolicyWords	285	12.811	23.030	0	217
PropExpansionary	246	0.552	0.315	0.000	1.000
PropContractionary	246	0.448	0.315	0.000	1.000
Panel B: Election = 1					
TotalWords	65	6,240.492	8,353.478	72	47,877
UniqueWords	65	1,174.369	878.109	56	4,821
LexDiv	65	0.288	0.132	0.101	0.806
PolicyWords	65	15.785	30.659	0	217
PropExpansionary	58	0.457	0.278	0.000	1.000
PropContractionary	58	0.543	0.278	0.000	1.000
Panel C: Election = 0					
TotalWords	220	5,719.150	7,025.263	41	55,004
UniqueWords	220	1,136.595	759.284	36	5,371
LexDiv	220	0.276	0.111	0.098	0.878
PolicyWords	220	11.932	20.241	0	157
PropExpansionary	188	0.581	0.320	0.000	1.000
PropContractionary	188	0.419	0.320	0.000	1.000

Table 3 shows the descriptive statistics of the text variables used in the dictionary-based content analysis, including the first two debates after Prince's Day every year. Panel A shows the descriptive statistics for the full sample, Panel B shows the descriptive statistics for all pre-election year debates (Election = 1), and Panel C shows the descriptive statistics for all other debates (Election = 0). The variables are defined in Appendix A, Table A4.

from 31.8% to only 27.9%. However, the number of policy words on average is higher in the first two debates than in the third debate. In the full sample in Table 2, the average number of policy words per debate per party, minister or state secretary is 8.678 while in Table 3, so when only the first two debates after Prince's Day are included, the average is 12.811 policy words. This is not surprising as the total number of words increased as well. Finally, the proportion of expansionary policy words and the proportion of contractionary policy words are moving closer to each other when only the first two debates after Prince's Day are included, compared to the full sample in Table 2.

Also, for the sub-sample in Table 3, the sample is split into debates that took place within 12 months before new elections (Election = 1) and the other debates (Election = 0). Just as in Table 2, the average total number of words and the average number of unique words is higher in pre-election year debates compared to the other debates. Also, the average number of policy words is higher in pre-election year debates compared to regular debates, with means of 15.786 and 11.932, respectively. However, the proportions of expansionary and contractionary words are moving closer to each other. But still, just as in Table 2, the proportion of contractionary policy words is higher in pre-election year debates while the proportion of expansionary policy words is higher in the regular debates, which is in contrast with hypothesis 1.

Table 4

Results of the unpaired two-sample t-tests: three debates per year

Variable	N	Mean		Std. Dev.	[95% Conf. Interval]		t	Sig.
		Election			Lower	Upper		(2-tailed)
		0	1					
TotalWords	466	4,285.413	4,891.381	690.774	-1,963.401	751.465	-0.877	0.381
UniqueWords	466	905.479	975.810	80.291	-228.111	87.450	-0.876	0.381
LexDiv	466	0.320	0.313	000.020	0.016	0.038	0.371	0.711
PolicyWords	466	7.875	11.438	2.100	-7.689	0.564	-1.697	0.090*
ProportionExp	325	0.613	0.377	0.044	0.151	0.323	5.410	0.000***
ProportionContr	325	0.387	0.623	0.044	-0.323	-0.151	-5.410	0.000***

*Table 4 shows the results of the unpaired two-sample t-tests on the word variables, including the first three debates after Prince's Day every year. The tests show whether the word variables of the pre-election year debates are statistically different from the word variables of the other debates. Statistical significance is presented as: * p<0.1; ** p<0.05; *** p<0.01.*

Table 5

Results of the unpaired two-sample t-tests: two debates per year

Variable	N	Mean		Std. Dev.	[95% Conf. Interval]		t	Sig.
		Election			Lower	Upper		(2-tailed)
		0	1					
TotalWords	285	5,719.150	6,240.492	1,037.159	-2,562.868	1,520.183	-0.503	0.616
UniqueWords	285	1,136.595	1,174.369	111.206	-256.670	181.123	-0.340	0.734
LexDiv	285	0.276	0.288	0.016	-0.044	0.021	-0.700	0.485
PolicyWords	285	11.932	15.785	3.249	-10.248	2.542	-1.186	0.237
ProportionExp	246	0.581	0.457	0.047	0.031	0.215	2.636	0.009***
ProportionContr	246	0.419	0.543	0.047	-0.215	-0.031	-2.636	0.009***

*Table 5 shows the results of the unpaired two-sample t-tests on the word variables, including the first two debates after Prince's Day every year. The tests show whether the word variables of the pre-election year debates are statistically different from the word variables of the other debates. Statistical significance is presented as: * p<0.1; ** p<0.05; *** p<0.01.*

5.1.2 Unpaired two-sample t-tests

To check whether the differences that raised in Table 2 are statistically different as well, unpaired two-sample t-tests are performed. The results of the t-tests are presented in Table 4. Here it shows that the total number of policy words in debates in pre-election years is statistically different from the total number of policy words in debates in regular years, at the 10 percent level. At the 1 percent level, the proportion of expansionary policy words is different between pre-election year debates and the regular debates. This is also the case for the proportion of contractionary policy words.

Following, to check whether the differences that raised in Table 3 are statistically different as well, again unpaired two-sample t-tests are performed. The results of the t-tests are presented in Table 5. In contrast to Table 4, the total number of policy words in debates in pre-election years is not statistically different anymore from the total number of policy words in regular years. The proportion of expansionary words and the proportion of contractionary words are still statistically different between the pre-election debates and the regular debates, at the 1 percent level. However, the difference has

decreased compared to the differences in proportions in Table 4. But still in both tables, the proportion of expansionary policy words is higher in the regular debates while the proportion of contractionary policy words is higher in the pre-election year debates, which is in contrast with hypothesis 1 and with the political business cycle theory.

5.1.3 Coalition and opposition analysis

The second hypothesis is examined in this section, by creating the dummy variable *Coalition* that equals one when the party is in the coalition in September of the belonging year, and zero when it is a party from the opposition. The ministers and state secretaries who spoke in the House of Representatives during the debates are excluded from the sample as they are not speaking on behalf of a coalition or an opposition party. Because the sub-sample sizes will become very small when only the first two debates after Prince's Day per year are included, the full sample with three debates per year is used here.

In Table 6, the descriptive statistics of the coalition and opposition analysis are presented. The table is split into four panels. Panel A and B include all coalition parties while Panel C and D only include all opposition parties. In addition, Panel A and C include only the pre-election year debates while Panel B and D only include the debates that are not within 12 months before new elections take place. What stands out is that the average total number of words per debate per party is a lot higher for the coalition parties, 6,319.833 in pre-election year debates and 5,439.530 in other years, compared to 3,611.781 in pre-election year debates and 3,336.690 in other debates for the opposition parties. This is not surprising, as the parties in the coalition are a lot larger than most parties in the opposition. Therefore, the parties in the coalition have a lot more time they are allowed to speak, per party, in the House of Representatives during the plenary debates. The proportion of policy words per debate is relatively constant and small per debate. When dividing the mean of *PolicyWords* by the mean of *TotalWords*, the proportion of policy words per debate per party is 0.23% in Panel A, 0.18% in Panel B, 0.21% in Panel C and 0.20% in Panel D.

What is surprising, however, is how the composition of policy words differs per panel in Table 6. In Panel A, so for the coalition parties in pre-election year debates, the proportion of contractionary policy words is about twice as high as the proportion of expansionary policy words. However, for Panel B, so again for the coalition parties but in the regular years, the proportion of expansionary policy words is almost twice as high as the proportion of contractionary policy words. This is not in line with the theory of Nordhaus (1975) on political business cycles, that expansionary policy is more important when elections are approaching, but does support hypothesis 2. Also, for the opposition parties, the proportion of contractionary policy words is higher when elections are approaching, compared to regular debates, as shown in Panel C and D of Table 6. However, the overall extent to which expansionary policy gets discussed by the coalition and opposition when elections are approaching is quite similar. This is also the case for the regular years. Therefore, these results in Table 6 do not really support hypothesis 2.

Table 6

Descriptive statistics: coalition and opposition analysis

Variables	N	Mean	St. Dev.	Min	Max
Panel A: Election = 1 & Coalition = 1					
TotalWords	18	6,319.833	5,500.154	2,018	20,478
UniqueWords	18	1,276.556	675.023	641	2,691
LexDiv	18	0.243	0.054	0.131	0.318
PolicyWords	18	14.611	19.467	0	75
PropExpansionary	15	0.318	0.287	0.000	0.853
PropContractionary	15	0.682	0.287	0.147	1.000
Panel B: Election = 0 & Coalition = 1					
TotalWords	66	5,439.530	4,858.161	99	20,452
UniqueWords	66	1,128.091	655.976	73	2,691
LexDiv	66	0.270	0.097	0.129	0.737
PolicyWords	66	9.621	16.073	0	77
PropExpansionary	51	0.622	0.309	0.000	0.853
PropContractionary	51	0.378	0.309	0.000	1.000
Panel C: Election = 1 & Coalition = 0					
TotalWords	73	3,611.781	3,390.859	13	16,360
UniqueWords	73	844.082	540.393	12	2,352
LexDiv	73	0.335	0.162	0.144	0.923
PolicyWords	73	7.712	9.552	0	41
PropExpansionary	57	0.389	0.318	0.000	1.000
PropContractionary	57	0.611	0.318	0.000	1.000
Panel D: Election = 0 & Coalition = 0					
TotalWords	229	3,336.690	2,967.039	1	14,294
UniqueWords	229	812.262	518.990	1	2,551
LexDiv	229	0.344	0.162	0.154	1.000
PolicyWords	229	6.633	9.863	0	57
PropExpansionary	161	0.598	0.345	0.000	1.000
PropContractionary	161	0.402	0.345	0.000	1.000

Table 6 shows the descriptive statistics of the text variables used in the dictionary-based content analysis, including the first three debates after Prince's Day every year. Panel A shows the descriptive statistics for the coalition in pre-election year debates. Panel B shows the descriptive statistics for the coalition in regular debates. Panel C shows the descriptive statistics for the opposition in pre-election year debates. Panel D shows the descriptive statistics for the opposition in regular debates. The variables are defined in Appendix A, Table A4.

5.1.4 Limitations

The dictionary-based content analysis performed on the plenary debates of the House of Representatives in the Netherlands comes with multiple limitations. Some of these limitations are standard for dictionary-based text analytics, others are more specific for this topic.

The main problem with the dictionary-based content analysis, is the dictionary that is used. There are no existing word lists that capture expansionary or contractionary policy. One reason for this is that most existing dictionaries are in English. Another reason is that the word list topics are very specific, therefore it is not surprising no word lists exist yet. Therefore, the word lists needed to be created manually. However, this makes it more questionable whether the validity of the word lists hold and whether it truly captures expansionary or contractionary policy. On one hand, many words are

probably still omitted from the word lists. On the other hand, words might be included that do not really capture expansionary or contractionary policy. For example, the word "groeit" is included in the expansionary policy word list. However, this word can be used in different ways. In the debate on the 24th of September 2013, Jesse Klaver of Groenlinks says: "Idealiter voorkomt deze wet dat onze veestapel ons nog verder boven het hoofd groeit".[3] Clearly, in this context the word "groeit" is not representing expansionary policy, even though according to the dictionary-based content analysis, it is.

In addition, dictionary-based text analysis can only focus on separate words, not on groups of words. Therefore, indicators of expansionary or contractionary policy that are not expressed by one word listed on the word list in Appendix A are not picked up. For instance, in the debate on the 17th of September 2015, Diederik Samson of the Partij van de Arbeid (PvdA) says: "om de btw met 2% te verlagen".[4] The word "btw-verlaging" is listed on the expansionary policy word list, however because Samson did not phrase it exactly in this way, even though the meaning is the same, the sentence is not captured as an expansionary policy sentence by the dictionary-based content analysis.

Another problem with dictionary-based text analysis in general is that this type of analysis does not focus on the context of a word. For instance, the word "bezuinigen" is marked as a contractionary policy word. However, when a politician says "we moeten niet bezuinigen", the goal is completely different than when a politician says "we moeten meer bezuinigen". In this example, in both cases only the word "bezuinigen" will be picked up by the dictionary-based content analysis as the word is listed as a contractionary policy word, even though in reality this might not portray contractionary policy. A clear example of this in the debates in the House of Representatives in the Netherlands is the debate on the 21st of September 2016, where Alexander Pechtold of D66 says: "Dan accepteer ik *geen* bezuiniging van 200 miljoen op scholen".[5]

Finally, the number of policy words that gets picked up through the dictionary-based content analysis in this paper is very low. On average, the number of policy words per debate per party, minister or state secretary is 8.678, while the average total number of words is 4,421.951, as shown in Table 2. This suggests on average only 0.20% of the words per debate per party, minister or state secretary are policy words. For the sub-sample including only the first two debates after Prince's Day each year, instead of three debates, this percentage gets only a little bit higher. The average number of policy words per debate per party, minister or state secretary is 12.811 while the average total number of words is 5,838.053, as shown in Table 3. This gives an average of 0.22%. This raises the question whether expansionary or contractionary policy is truly discussed in the plenary debates, or whether the word lists are appropriate to pick this up when it does get discussed.

Because of these limitations on the dictionary-based content analysis, another text analytics approach might be more suitable for detecting political business cycles in the plenary debates of the

[3] Retrieved from: https://www.tweedekamer.nl/kamerstukken/plenaire_verslagen/detail/2013-2014/4
[4] Retrieved from: https://www.tweedekamer.nl/kamerstukken/plenaire_verslagen/detail/2015-2016/3
[5] Retrieved from: https://www.tweedekamer.nl/kamerstukken/plenaire_verslagen/detail/2016-2017/2

House of Representatives in the Netherlands. In particular, another dictionary is necessary in order to perform further analyses on the debates.

5.2 Emotion and sentiment analysis

Another approach to detect cycles in the plenary debates in the House of Representatives in the Netherlands might by through dictionary-based emotion and sentiment analysis. In this analysis, the tone per debate per party, minister of state secretary is measured. Secondly, the data is aggregated for coalition parties and opposition parties, to compare the emotion and sentiment amongst the coalition and opposition in the plenary debates.

As the main problem with the dictionary-based content analysis is the dictionary used, a new approach will probably be more suitable when the new dictionary is more reliable and more extensive. Therefore, with the further analyses, only an existing dictionary is used in order to limit the subjectivity of the analyses. As discussed in the methodology section, the dictionary that will be used for the emotion and sentiment analysis is the NRC Emotion Lexicon, as this can be used for Dutch language and has been used in research in the field of politics before.

The NRC Emotion Lexicon includes eight emotion categories: anger, anticipation, disgust, fear, joy, sadness, surprise, and trust. These eight categories together are referred to as "emotion words". In addition, the sentiment categories that are included are: negative and positive. These two categories combined, negative and positive, are referred to as "sentiment words".

In this section, first the descriptive statistics on the emotion word and sentiment word values are discussed. Next, unpaired two-sample t-tests are performed to test whether the tone per debate per party, minister, or state secretary, differs in pre-election and regular years. Finally, coalition-opposition analysis is performed to explore whether the level of emotion or sentiment differs between parties from the coalition or opposition.

5.2.1 Descriptive statistics

The descriptive statistics are presented in Table 7 below. Panel A of Table 7 shows the descriptive statistics of the total combined sample. This means that there is not made a subset with election or non-election years, or with coalition or opposition parties. Panel B shows the descriptive statistics of the pre-election debates. Panel C shows the descriptive statistics of the debates in September in all other years, thus that were not prior to elections of the House of Representatives.

The variable *EmotionWords* counts the total number of emotion words, so words that are categorized as anger, anticipation, disgust, fear, joy, sadness, surprise, or trust, matched by the NRC Emotion Lexicon. The variable *SentiWords* counts the total number of sentiment words, so words that are categorized as negative or positive, matched by the NRC Emotion Lexicon. The variable *PropAnger* calculates the proportion of words classified as anger, by dividing the total number of words classified as anger, by the total number of emotion words, per debate per party, minister, or state secretary.

Table 7

Descriptive statistics: three debates per year

Panel A: Full sample

Variables	N	Mean	St. Dev.	Min	Max
EmotionWords	466	179.127	143.116	0	861
SentiWords	466	114.517	90.476	0	583
PropAnger	465	0.091	0.038	0.000	0.400
PropAnticipation	465	0.169	0.050	0.000	0.500
PropDisgust	465	0.060	0.044	0.000	0.500
PropFear	465	0.120	0.042	0.000	0.333
PropJoy	465	0.101	0.037	0.000	0.333
PropSadness	465	0.099	0.056	0.000	1.000
PropSurprise	465	0.071	0.029	0.000	0.250
PropTrust	465	0.289	0.113	0.000	1.000
PropNegative	465	0.342	0.084	0.000	0.569
PropPositive	465	0.658	0.084	0.431	1.000
PropEmotionWords	466	0.056	0.025	0.000	0.320
PropSentiWords	466	0.038	0.020	0.000	0.200
Panel B: Election = 1					
EmotionWords	105	198.457	161.439	1	794
SentiWords	105	124.010	99.863	2	521
PropAnger	105	0.091	0.035	0.000	0.155
PropAnticipation	105	0.165	0.040	0.000	0.261
PropDisgust	105	0.059	0.029	0.000	0.143
PropFear	105	0.128	0.045	0.000	0.333
PropJoy	105	0.099	0.035	0.000	0.200
PropSadness	105	0.101	0.037	0.000	0.188
PropSurprise	105	0.072	0.035	0.000	0.250
PropTrust	105	0.284	0.119	0.157	1.000
PropNegative	105	0.356	0.097	0.000	0.569
PropPositive	105	0.644	0.097	0.431	1.000
PropEmotionWords	105	0.057	0.023	0.016	0.162
PropSentiWords	105	0.038	0.018	0.011	0.154
Panel C: Election = 0					
EmotionWords	361	173.504	137.063	0	861
SentiWords	361	111.756	87.513	0	583
PropAnger	360	0.091	0.039	0.000	0.400
PropAnticipation	360	0.169	0.052	0.000	0.500
PropDisgust	360	0.060	0.047	0.000	0.500
PropFear	360	0.118	0.041	0.000	0.250
PropJoy	360	0.102	0.038	0.000	0.333
PropSadness	360	0.098	0.060	0.000	1.000
PropSurprise	360	0.071	0.028	0.000	0.235
PropTrust	360	0.290	0.112	0.000	1.000
PropNegative	360	0.338	0.080	0.000	0.515
PropPositive	360	0.662	0.080	0.485	1.000
PropEmotionWords	361	0.056	0.026	0.000	0.320
PropSentiWords	361	0.038	0.020	0.000	0.200

Table 7 shows the descriptive statistics of the text variables used in the dictionary-based emotion and sentiment analysis including the first three debates after Prince's Day every year. Panel A shows the descriptive statistics for the full sample, Panel B shows the descriptive statistics for all pre-election year debates (Election = 1), and Panel C shows the descriptive statistics for all other debates (Election = 0). The variables are defined in Appendix A, Table A4.

The same manner applies for the variables *PropAnticipation*, *PropDisgust*, *PropFear*, *PropJoy*, *PropSadness*, *PropSurprise* and *PropTrust*. The variable *PropNegative* calculates the proportion of words classified as negative, by dividing the total number of words classified as negative by the total number of sentiment words, per debate per party, minister, or state secretary. The same reasoning applies for the variable *PropPositive*. The variable *PropEmotionWords* represents how many words per debate per party, minister or state secretary are classified as emotion words, as the variable is calculated as the total number of emotion words divided by the total number of words, per debate per party, minister, or state secretary. The variable *PropSentiWords* represents how many words per debate per party, minister, or state secretary are classified as sentiment words and is calculated in a similar way. All these variables are also defined in Table A4 in Appendix A.

What stands out in the descriptive statistics presented in Table 7 is that the average number of emotion words and the average number of sentiment words are both higher in the pre-election year debates compared to the control period. This suggests that there is indeed more emotion and sentiment present in the plenary debates in the House of Representatives when elections are approaching. However, the descriptive statistics do not show any statistical significance, therefore it is not possible to conclude that the number of emotion words or the number of sentiment words used in the plenary debates is statistically higher when elections are approaching compared to regular years. In addition, the average proportion of emotion words, thus the number of emotion words divided by the total number of words per debate per party, minister, or state secretary, is almost the same in the pre-election year debates and the other debates, 5.7% compared to 5.6% respectively. The proportion of sentiment words is the same in both sub-groups, and this proportion is equal to only 3.8%. These results do not support hypothesis 3, which suggests the level of emotion or sentiment is higher in pre-election year debates.

In the proportions in the descriptive statistics, what stands out is that the overall tone seems rather positive and respectful. The proportion of emotion words in both the pre-election year debates as the regular debates is the highest in the category "trust" and the lowest in the categories "disgust" and "anger". For the sentiment words, in all years the proportion of positive words is about twice as high as the proportion of negative words. This suggests that the tone in the plenary debates does not become harsher or more violent when elections are approaching, which is in contrast with the findings of Schwalbach (2022).

Following, the descriptive statistics are presented in Table 8 for the sub-sample created in Table 3, which includes only the first two debates after Prince's Day each year instead of three debates yearly. What stands out is that the average number of emotion words per debate per party, minister, or state secretary is higher when only the first two debates after Prince's Day each year are included, as in Table 7, this average equals 179.127 while in Table 8, this average is equal to 229.404. Comparable results are found for the average number of sentiment words, which is equal to 114.517 in Table 7 but 145.821 in Table 8. In addition, the minimum number of emotion words and sentiment words in the full sample in Table 7 is zero, while for the sub-sample in Table 8, the minimum number of emotion words is three

Table 8

Descriptive statistics: two debates per year

Panel A: Full sample

Variables	N	Mean	St. Dev.	Min	Max
EmotionWords	285	229.404	153.432	3	861
SentiWords	285	145.821	97.102	2	583
PropAnger	285	0.097	0.028	0.000	0.200
PropAnticipation	285	0.166	0.034	0.000	0.333
PropDisgust	285	0.061	0.027	0.000	0.250
PropFear	285	0.126	0.033	0.000	0.250
PropJoy	285	0.109	0.029	0.000	0.200
PropSadness	285	0.104	0.030	0.000	0.192
PropSurprise	285	0.072	0.024	0.000	0.250
PropTrust	285	0.265	0.082	0.157	1.000
PropNegative	285	0.357	0.075	0.000	0.543
PropPositive	285	0.643	0.075	0.457	1.000
PropEmotionWords	285	0.053	0.024	0.016	0.320
PropSentiWords	285	0.034	0.014	0.011	0.160
Panel B: Election = 1					
EmotionWords	65	249.908	177.505	8	794
SentiWords	65	153.677	110.615	5	521
PropAnger	65	0.099	0.031	0.000	0.151
PropAnticipation	65	0.164	0.028	0.116	0.250
PropDisgust	65	0.062	0.023	0.000	0.113
PropFear	65	0.130	0.036	0.000	0.250
PropJoy	65	0.109	0.034	0.000	0.200
PropSadness	65	0.110	0.031	0.000	0.188
PropSurprise	65	0.073	0.031	0.000	0.250
PropTrust	65	0.253	0.062	0.157	0.538
PropNegative	65	0.372	0.088	0.000	0.543
PropPositive	65	0.628	0.088	0.457	1.000
PropEmotionWords	65	0.058	0.024	0.016	0.143
PropSentiWords	65	0.036	0.014	0.011	0.077
Panel C: Election = 0					
EmotionWords	220	223.345	145.462	3	861
SentiWords	220	143.500	92.764	2	583
PropAnger	220	0.096	0.028	0.000	0.200
PropAnticipation	220	0.166	0.036	0.000	0.333
PropDisgust	220	0.061	0.029	0.000	0.250
PropFear	220	0.125	0.032	0.000	0.250
PropJoy	220	0.109	0.027	0.000	0.185
PropSadness	220	0.102	0.030	0.000	0.192
PropSurprise	220	0.071	0.021	0.000	0.192
PropTrust	220	0.269	0.087	0.161	1.000
PropNegative	220	0.353	0.071	0.000	0.506
PropPositive	220	0.647	0.071	0.494	1.000
PropEmotionWords	220	0.052	0.024	0.016	0.320
PropSentiWords	220	0.034	0.014	0.011	0.160

Table 8 shows the descriptive statistics of the text variables used in the dictionary-based emotion and sentiment analysis including the first two debates after Prince's Day every year. Panel A shows the descriptive statistics for the full sample, Panel B shows the descriptive statistics for all pre-election year debates (Election = 1), and Panel C shows the descriptive statistics for all other debates (Election = 0). The variables are defined in Appendix A, Table A4.

and the minimum number of sentiment words is two. These findings suggest that the level of emotion words and sentiment are higher in the first two debates after Prince's Day each year than in the third debate. However, when focusing on the variables *PropEmotionWords* and *PropSentiWords*, the opposite results are found. The proportion of emotion words in the full sample in Table 7 on average is 5.6%, while in the sub-sample in Table 8, this average decreased to 5.3%. Also, for the proportion of sentiment words, the average decreased from 3.8% in Table 7 to only 3.4% in Table 8. These numbers actually suggest that the level of emotion is lower in the first two debates after Prince's Day each year.

Also, for the sub-sample in Table 8, the sample is split again into debates that took place within 12 months before new elections (Election = 1) and the other debates (Election = 0). Just as in Table 7, the average number of emotion words and the average number of sentiment words is higher in pre-election year debates compared to the other debates. The number of emotion words per debate per party, minister, or state secretary is on average 249.908 in pre-election years, while the average is only 223.345 in regular years. For the number of sentiment words, the average per debate per party, minister, or state secretary is 153.677 in pre-election years while it is only 143.500 in the other years. But more importantly, the proportion of emotion words per debate per party, minister, or state secretary is 5.8% in pre-election years while it is only 5.2% in regular years. This suggests that politicians speak with more emotion when elections are approaching, according to Table 8. Also, for the proportion of sentiment words, the percentage is higher in pre-election year debates. In these years, the average proportion of sentiment words per debate per party, minister or state secretary is 3.6%. In the regular years, this percentage is on average only 3.4%. Thus, this suggests that the level of sentiment in the plenary debates in the House of Representatives is higher as well when elections are approaching within the next 12 months. In contrast to the results in Table 7, the results in Table 8 do support hypothesis 3.

Just as in Table 7, most of the proportions of the specific emotion or sentiment categories do not differ much between pre-election year debates and the other debates. For instance, the proportion of words in the category "joy" is the same in both sub-groups, equal to 10.9%. The emotion category "trust" seems however to differ between pre-election year debates and the other debates, equal to 25.3% and 26.9%, respectively. This observation is in line with the expectations, as it makes sense that opposition parties purposely do not express their trust in the coalition when elections are approaching (Schwalbach, 2022). Also, the proportions of negative and positive words are a little different between pre-election year debates and the other debates. The proportion of positive words in pre-election year debates is 62.8% while it is 64.7% on average for the other years. This is also in line with the expectation that the opposition probably talks less positive about the coalition when a new election is upcoming. Even though there are some differences, it is surprising that the proportion of trust and positivity are relatively high in all debates. This is not in line with the findings of Schwalbach (2022), who states that there is usually a more severe negative tone in speech by politicians from the parties in the opposition.

Table 9

Results of the unpaired two-sample t-tests: three debates per year

Variable	N	Mean		Std. Dev.	[95% Conf. Interval]		t	Sig.
		Election			Lower	Upper		(2-tailed)
		0	1					
EmotionWords	466	173.504	198.457	15.843	-56.086	6.180	-1.575	0.116
SentiWords	466	111.756	124.010	10.026	-31.956	7.450	-1.222	0.222
PropAnger	465	0.091	0.091	0.004	-0.008	0.008	0.029	0.977
PropAnticipation	465	0.169	0.165	0.006	-0.008	0.014	0.611	0.541
PropDisgust	465	0.060	0.059	0.005	-0.009	0.011	0.202	0.840
PropFear	465	0.118	0.128	0.005	-0.019	-0.001	-2.196	0.029**
PropJoy	465	0.102	0.099	0.004	-0.006	0.010	0.564	0.573
PropSadness	465	0.098	0.101	0.006	-0.015	0.009	-0.493	0.623
PropSurprise	465	0.071	0.072	0.003	-0.008	0.005	-0.045	0.647
PropTrust	465	0.289	0.284	0.013	-0.020	0.030	0.404	0.686
PropNegative	465	0.338	0.356	0.009	-0.037	0.000	-1.927	0.055*
PropPositive	465	0.662	0.644	0.010	-0.004	0.035	1.562	0.119
PropEmotionWords	466	0.056	0.057	0.003	-0.007	0.004	-0.531	0.596
PropSentiWords	466	0.038	0.038	0.002	-0.004	0.005	0.112	0.911

*Table 9 shows the results of the unpaired two-sample t-tests on the emotion and sentiment variables, including the first three debates after Prince's Day every year. The tests show whether the variables are statistically different when pre-election year debates are compared to the control period. Statistical significance is presented as: * p<0.1; ** p<0.05; *** p<0.01.*

Table 10

Results of the unpaired two-sample t-tests: two debates per year

Variable	N	Mean		Std. Dev.	[95% Conf. Interval]		t	Sig.
		Election			Lower	Upper		(2-tailed)
		0	1					
EmotionWords	285	223.345	249.908	21.641	-69.161	16.036	-1.227	0.221
SentiWords	285	143.500	153.677	13.706	-37.156	16.803	-0.742	0.458
PropAnger	285	0.096	0.099	0.004	-0.011	0.005	-0.754	0.451
PropAnticipation	285	0.166	0.164	0.005	-0.008	0.011	0.318	0.751
PropDisgust	285	0.061	0.062	0.004	-0.009	0.006	-0.330	0.742
PropFear	285	0.125	0.130	0.005	-0.014	0.005	-0.940	0.348
PropJoy	285	0.109	0.109	0.004	-0.008	0.008	-0.001	0.999
PropSadness	285	0.102	0.110	0.004	-0.016	0.001	-1.744	0.082*
PropSurprise	285	0.071	0.073	0.003	-0.008	0.005	-0.503	0.616
PropTrust	285	0.269	0.253	0.012	-0.007	0.039	1.401	0.162
PropNegative	285	0.353	0.372	0.011	-0.040	0.001	-1.829	0.068*
PropPositive	285	0.647	0.628	0.011	-0.001	0.040	1.829	0.068*
PropEmotionWords	285	0.052	0.058	0.003	-0.013	0.001	-1.736	0.084*
PropSentiWords	285	0.034	0.036	0.002	-0.006	0.002	-0.847	0.397

*Table 10 shows the results of the unpaired two-sample t-tests on the emotion and sentiment variables, including the first two debates after Prince's Day every year. The tests show whether the variables are statistically different when pre-election year debates are compared to the control period. Statistical significance is presented as: * p<0.1; ** p<0.05; *** p<0.01.*

5.2.2 Unpaired two-sample t-tests

To check whether the differences that raised in Table 7 are statistically different as well, unpaired two-sample t-tests are performed. The results of the t-tests are presented in Table 9. These results show that the average number of emotion words or sentiment words is not statistically different in pre-election year debates compared to regular debates. Also, the proportion of emotion words or the proportion of sentiment words is not statistically different between the two sub-groups.

The composition of emotion words and sentiment words however is statistically different between pre-election year debates and the other debates. Regarding the emotion words, the proportion of words classified as "fear" is higher in pre-election year debates, on average 12.8%, compared to the other years, where the average is only 11.8%. For the sentiment words, the proportion of negative words is only 33.7% on average in regular debates while it is on average 35.6% in the debates in pre-election years. This suggests that there is a slight change in the tone of the plenary debates in the House of Representatives when new elections are approaching.

Next, to check whether the differences that raised in Table 8 are statistically different as well, again unpaired two-sample t-tests are performed. The results of the t-tests are presented in Table 10. In contrast to Table 9, in Table 10 with the sub-sample, the average proportion of emotion words per debate per party, minister, or state secretary is statistically higher in the pre-election year debates, at the 10 percent level. Regarding the categories of emotion words, only in the proportion of words from the category "sadness", the difference is statistically significant, at the 10 percent level. The proportion of words classified as "sadness" is higher in the pre-election year debates, compared to the regular debates. This seems to prove that the level of emotion in the plenary debates in the House of Representatives increases when new elections are approaching, which is in line with hypothesis 3.

Regarding the sentiment words, the average proportion of sentiment words per debate per party, minister, or state secretary is not statistically different in pre-election year debates or regular debates, which does not support hypothesis 3. The composition of the sentiment words, however, is statistically different at the 10 percent level. The average proportion of negative words is higher in pre-election year debates, while the average proportion of positive words is higher in the regular debates. This suggests that the plenary debates in the House of Representatives have a more negative tone when elections are upcoming within the next 12 months, which does support hypothesis 3.

5.2.3 Coalition and opposition analysis

In this section, again the sample is split into coalition and opposition parties, for the pre-election year debates and the other debates, to analyze whether the level of emotion or sentiment is different between the coalition and opposition parties. Again, the ministers and state secretaries who spoke in the House of Representatives during the debates are excluded from the sample as they are not speaking in behalf of a coalition or an opposition party. Because the sub-sample sizes will become very small when only

Table 11

Descriptive statistics: coalition and opposition analysis

Variables	N	Mean	St. Dev.	Min	Max
Panel A: Election = 1 & Coalition = 1					
EmotionWords	18	262.833	165.849	91	610
SentiWords	18	164.722	100.667	63	376
PropAnger	18	0.096	0.023	0.054	0.131
PropAnticipation	18	0.169	0.018	0.143	0.201
PropDisgust	18	0.059	0.012	0.033	0.082
PropFear	18	0.133	0.019	0.099	0.182
PropJoy	18	0.110	0.021	0.059	0.149
PropSadness	18	0.107	0.019	0.066	0.142
PropSurprise	18	0.065	0.012	0.043	0.091
PropTrust	18	0.261	0.032	0.216	0.330
PropNegative	18	0.397	0.050	0.286	0.444
PropPositive	18	0.633	0.050	0.556	0.714
PropEmotionWords	18	0.047	0.009	0.029	0.062
PropSentiWords	18	0.030	0.005	0.018	0.038
Panel B: Election = 0 & Coalition = 1					
EmotionWords	66	217.742	141.517	1	602
SentiWords	66	139.152	87.538	2	376
PropAnger	66	0.088	0.025	0.000	0.130
PropAnticipation	66	0.180	0.043	0.000	0.375
PropDisgust	66	0.051	0.017	0.000	0.081
PropFear	66	0.115	0.031	0.000	0.166
PropJoy	66	0.114	0.026	0.000	0.185
PropSadness	66	0.106	0.114	0.037	1.000
PropSurprise	66	0.072	0.017	0.000	0.115
PropTrust	66	0.273	0.055	0.000	0.395
PropNegative	66	0.325	0.061	0.200	0.500
PropPositive	66	0.675	0.061	0.500	0.800
PropEmotionWords	66	0.048	0.014	0.010	0.091
PropSentiWords	66	0.031	0.010	0.017	0.068
Panel C: Election = 1 & Coalition = 0					
EmotionWords	73	180.644	133.950	1	598
SentiWords	73	110.664	78.596	2	328
PropAnger	73	0.093	0.037	0.000	0.155
PropAnticipation	73	0.159	0.043	0.000	0.250
PropDisgust	73	0.061	0.032	0.000	0.143
PropFear	73	0.131	0.049	0.000	0.333
PropJoy	73	0.099	0.039	0.000	0.200
PropSadness	73	0.102	0.039	0.000	0.188
PropSurprise	73	0.072	0.039	0.000	0.250
PropTrust	73	0.283	0.137	0.157	1.000
PropNegative	73	0.362	0.103	0.000	0.569
PropPositive	73	0.638	0.103	0.431	1.000
PropEmotionWords	73	0.061	0.023	0.028	0.162
PropSentiWords	73	0.040	0.020	0.020	0.154

Panel D: Election = 0 & Coalition = 0

Variables	N	Mean	St. Dev.	Min	Max
EmotionWords	229	162.262	114.812	0	511
SentiWords	229	103.550	71.034	0	318
PropAnger	228	0.096	0.043	0.000	0.400
PropAnticipation	228	0.163	0.057	0.000	0.500
PropDisgust	228	0.067	0.057	0.000	0.500
PropFear	228	0.120	0.045	0.000	0.250
PropJoy	228	0.101	0.041	0.000	0.333
PropSadness	228	0.095	0.040	0.000	0.179
PropSurprise	228	0.070	0.031	0.000	0.235
PropTrust	228	0.289	0.129	0.143	1.000
PropNegative	228	0.349	0.087	0.000	0.515
PropPositive	228	0.651	0.087	0.485	1.000
PropEmotionWords	229	0.060	0.029	0.000	0.320
PropSentiWords	229	0.042	0.023	0.000	0.200

Table 11 shows the descriptive statistics of the text variables used in the dictionary-based emotion and sentiment analysis, including the first three debates after Prince's Day every year. Panel A shows the descriptive statistics for the coalition in pre-election year debates. Panel B shows the descriptive statistics for the coalition in regular debates. Panel C shows the descriptive statistics for the opposition in pre-election year debates. Panel D shows the descriptive statistics for the opposition in regular debates. The variables are defined in Appendix A, Table A4.

the first two debates after Prince's Day per year are included, again the full sample with three debates per debate is used here. In Table 11, the descriptive statistics of the coalition and opposition analysis are presented. The table is again split into four panels, similar to Table 6. Panel A and B include all coalition parties while Panel C and D only include all opposition parties. In addition, Panel A and C include only the pre-election year debates while Panel B and D only include the debates that are not within 12 months before new elections take place.

What immediately stands out in Table 11 is that the proportion of emotion words per party per debate is higher for the opposition parties than for the coalition parties, both in pre-election year debates and the regular debates. In the pre-election year debates, the average proportion of emotion words per debate per opposition party is 6.1% while this is only 4.7% for the coalition parties, as shown in Panel C and Panel A, respectively. In the regular years, the average proportion of emotion words is 6.0% for the opposition parties and only 4.8% for the coalition parties. The composition of emotion words however is not very different per sub-sample. In all four panels in Table 11, the proportion of words in the category "trust" is the highest, and the proportion of words in the category "disgust" is the lowest. This is also the case in the descriptive statistics in Table 7 and Table 8.

Moving on to the proportion of sentiment words per party per debate, this is on average again higher for the opposition parties than for the coalition parties, in both the pre-election year debates and the other debates. For the pre-election year debates, the average proportion of sentiment words is 4.0% for the opposition parties, while this is only 3.0% for the coalition parties, as shown in Table 11 in Panel C and Panel A, respectively. In the other debates, the average proportion of sentiment words is 4.2% for the opposition parties, and for the coalition parties this is only 3.1%, as shown in Panel D and B,

respectively. This is in line with the findings of Schwalbach (2022), who finds that the tone of the opposition towards the coalition becomes harsher or more negative when elections are approaching.

The composition of the sentiment words seems also in line with Schwalbach (2022). The average proportion of negative sentiment words of the opposition when the elections are approaching is 36.2%, as shown in Panel C of Table 11. Meanwhile, the average proportion of negative sentiment words of the opposition in regular years is only 34.9%, as shown in Panel D of Table 11. Even though the percentage in pre-election year debates is higher, the difference however is only small.

5.2.4 Limitations

The dictionary-based emotion and sentiment analysis performed on the plenary debates of the House of Representatives in the Netherlands also comes with multiple limitations. Some of these limitations are similar to the limitations of the dictionary-based content analysis. For instance, with both methods, the context is not considered as only single words can be matched to the dictionary. Other limitations are more specific for the dictionary-based emotion and sentiment analysis method used here.

First of all, the choice of dictionary might not be the optimal choice. The NRC Emotion Lexicon is originally made for English language, however, to use it for Dutch language, the dictionary is translated to Dutch through Google Translate (Mohammad et al., 2013). On one hand, this is less biased as a researcher did not translate a dictionary by himself, which might lead to subjective translations. On the other hand, the meaning of certain words might get lost through Google Translate.

In addition, certain Dutch sayings or words are highly likely omitted from the dictionary as the original dictionary was in English. For instance, in the debate on the 19th of September 2019, Geert Wilders says: "Mensen vragen zich af: hebben we in Nederland nog wel een rechtsstaat of hebben we een narcostaat?".[6] This sentence is clearly negative, however in this sentence no words are mentioned that are also listed in the NRC Emotion Lexicon. The word "narcostaat" can be translated to English, however it is a Dutch word that is made up. Thus, this word will never be included in an English dictionary that is translated to Dutch through Google Translate. Therefore, there probably are many sentences left in the debates of which the tone is not picked up by the NRC Emotion Lexicon, or by other dictionaries that were originally made for the English language. This expectation is confirmed by the average proportion of emotion words and the average proportion of sentiment words in the debates, which are only 5.6% and 3.8% respectively, as shown in Table 7.

Finally, the dictionary-based emotion and sentiment analysis is only able to look at the words that are spoken, but cannot detect body language, sarcasm, jokes or just someone's personality and way of speech. For instance, when something is being said as a joke or with a lot of sarcasm, the sentiment analysis might detect such sentence as "negative", even though in reality it is not. This might lead to wrong classifications of words as well, which in turn will lead to false conclusions.

[6] Retrieved from: https://www.tweedekamer.nl/kamerstukken/plenaire_verslagen/detail/2019-2020/3

6. Discussion and conclusion

Political business cycles have been researched many times before, with the model of Nordhaus (1975) as one of the main models used to quantitatively research theses cycles. However, this model, or many models based on the one from Nordhaus (1975) come with many caveats, which leads to ambiguous results by previous researchers. Therefore, the need to explore a new research method in an attempt to detect political business cycles rises. Focusing on the plenary debates in the House of Representatives in the Netherlands, the research question arises:

Can dictionary-based quantitative text analysis be used to detect political business cycles in the House of Representatives in the Netherlands?

The methods used to detect political business cycles in the House of Representatives in the Netherlands are dictionary-based content analysis, and dictionary-based emotion and sentiment analysis. With both methods, dictionaries are used to match the words from the plenary debates in the House of Representatives in the Netherlands. The analyses use a unique sample, as all transcriptions of the debates are hand-collected and manually split into parties, ministers, and state secretaries who spoke during the plenary debate. Because of this, it is possible to perform analyses on coalition-opposition-level as well.

Using dictionary-based content analysis, the results show that expansionary and contractionary policy words are used more in the plenary debates when elections are approaching. What stands out is that the average proportion of contractionary policy words is a higher in pre-election year debates than in regular years. This suggests that contractionary policy is discussed more when elections are upcoming. This finding is not in line with the political business cycle theory of Nordhaus (1975) and does not support hypothesis 1. Following, the coalition-opposition analysis shows that the overall extent to which expansionary policy gets discussed by the coalition and opposition when elections are approaching, but also in regular years, is quite similar. This is not in line with hypothesis 2.

The dictionary-based emotion and sentiment analysis makes use of the NRC Emotion Lexicon, which consists of eight categories of emotion words, and two categories of sentiment words. The results show that the proportion of emotion words is statistically higher when elections are upcoming, than in the regular debates, which support hypothesis 3. The proportion of sentiment words per debate per party, minister, or state secretary is not statistically different in pre-election year debates and in regular debates, which is not in line with hypothesis 3. There are, however, differences found for the composition of the sentiment words in the debates. In the pre-election year debates, on average the sentiment is more negative than in the regular debates. Finally, the coalition and opposition analysis shows that for both the pre-election year debates and in regular debates, the proportion of emotion words and the proportion of sentiment words are higher for the opposition. This is in line with the findings of Schwalbach (2022).

However, the quantitative text analysis methods used are accompanied by multiple limitations. First of all, dictionary-based text analysis cannot take into account the context in which a word is used.

The method only matches single words in the texts to the single words in the dictionary. Secondly, the choice of dictionary is very important and can give some problems, as it might not include words that should be classified as expansionary or contractionary policy words, or as a certain emotion or sentiment. The dictionary-based content analysis portrays these limitations, as the proportion of policy words per debate per party, minister, or state secretary is only about 0.20%, which is very low. This makes it debatable whether the word lists created for this analysis can really capture the discussion of expansionary or contractionary policy in the debates. Following, most dictionaries are made for English language in the first place, and later translated to Dutch through Google Translate. Translating by Google Translate might be problematic too. On one hand, it is an objective way to translate a dictionary as the research cannot interfere. On the other hand, the meaning of certain words might get lost.

The main goal of this paper is to explore whether quantitative text analysis can be used in the detection of political business cycles, which has not been researched before. Therefore, it does not come as a surprise that the research method is not perfect yet, which is reflected in the results. The main focus of previous research on political business cycles is on existing data on employment, GDP, economic growth, or government expenditures. However, the results of these studies are ambiguous. In addition, previous studies usually focus on the outcome variables, and not on politicians who only *advocate* for expansionary fiscal policy short before elections. Applying these quantitative text analysis methods into a new area is interesting and an important addition to existing literature on political business cycles.

Also in the real world, the methodology and results of this paper are relevant. The typical variables used in political business cycle models are the unemployment and inflation rates, but it is possible that citizens are not really aware of these exact numbers. It is more plausible that citizens watch interviews or debates with politicians short before the election, or watch the highlights in the media, and base their voting decision on this information. Therefore, it is interesting to analyze the sentiment level in the debates between politicians, and to measure which emotions are used in their speeches.

As the quantitative text analysis methods to detect political business cycles still have some caveats, some suggestions for further research can be made. First of all, the choice of dictionary or the word list that is created is important. Therefore, a suggestion would be to expand the word list from Table A1 or create a new word list, as the list here is relatively short. Also, as most existing dictionaries are made for English language, it might be insightful to apply the dictionary-based emotion and sentiment analysis on debates in the parliaments of countries where English is the native language. In addition, it would be interesting to see how the results would change when more debates would be included, or when also other speeches from politicians would be added. For instance, debates in the week before an election that are broadcast on television, as many citizens will might partly base their vote on such appearances. Finally, a more sophisticated method than the dictionary-based text analysis method might be appropriate, especially when this method does not only match single words from texts to single words in dictionaries, but also can include the context in which the word is used.

References

Alessia, D., Ferri, F., Grifoni, P., and Guzzo, T. (2015). Approaches, tools and applications for sentiment analysis implementation. *International Journal of Computer Applications*, *125*(3).

Alpanda, S., and Honig, A. (2009). The impact of central bank independence on political monetary cycles in advanced and developing nations. *Journal of Money, Credit and Banking*, *41*(7), 1365-1389.

Baber, W. R., and Sen, P. K. (1986). The political process and the use of debt financing by state governments. *Public Choice*, *48*(3), 201-215.

Barberia, L. G., and Avelino, G. (2011). Do political budget cycles differ in Latin American democracies?. *Economía*, *11*(2), 101-134.

Blaydes, L. (2010). *Elections and distributive politics in Mubarak's Egypt*. Cambridge, UK: Cambridge University Press.

Block, S. A. (2002). Political business cycles, democratization, and economic reform: the case of Africa. *Journal of Development economics*, *67*(1), 205-228.

Block, S. A., Ferree, K. E., and Singh, S. (2003). Multiparty competition, founding elections and political business cycles in Africa. *Journal of African Economies*, *12*(3), 444-468.

Brender, A., and Drazen, A. (2005). Political budget cycles in new versus established democracies. *Journal of Monetary Economics*, *52*(7), 1271-1295.

Brender, A., and Drazen, A. (2013). Elections, leaders, and the composition of government spending. *Journal of Public Economics*, *97*, 18-31.

CBS. (2022). *Inflation rate up to 9.7 percent in March*. Retrieved from https://www.cbs.nl/en-gb/news/2022/14/inflation-rate-up-to-9-7-percent-in-march.

Chaudhuri, K., and Dasgupta, S. (2005). The political determinants of central governments' economic policies in India: an empirical investigation. *Journal of International Development*, *17*(7), 957-978.

Clark, W. R., and Hallerberg, M. (2000). Mobile capital, domestic institutions, and electorally induced monetary and fiscal policy. *American Political Science Review*, *94*(2), 323-346.

Clingermayer, J. C., and Wood, B. D. (1995). Disentangling patterns of state debt financing. *American Political Science Review*, *89*(1), 108-120.

Dinkel, R. (1981). Political business cycles in Germany and the United States: Some theoretical and empirical considerations. *Contemporary political economy*, 209-230.

Downs, A. (1957). *An economic theory of democracy*. New York: Harper and Row.

Dubois, E. (2016). Political business cycles 40 years after Nordhaus. *Public Choice*, *166*(1), 235-259.

Friedman, M., and Schwartz, A. J. (1965). Money and business cycles. In *The state of monetary economics* (pp. 32-78). NBER.

Frey, B. S., and Schneider, F. (1978a). An empirical study of politico-economic interaction in the United States. *The Review of Economics and Statistics*, 174-183.

Frey, B. S., and Schneider, F. (1978b). A politico-economic model of the United Kingdom. *The Economic Journal*, *88*(350), 243-253.

Gamez, C., and Ibarra-Yunez, A. (2007). Political cycles and public expenditures at subnational level: the case of Mexico. *Public Administration (16484541)*, *4*(16).

Guo, G. (2009). China's local political budget cycles. *American Journal of Political Science*, *53*(3), 621-632.

Hallerberg, M., De Souza, L. V., and Clark, W. R. (2002). Political business cycles in EU accession countries. *European Union Politics*, *3*(2), 231-250.

Keynes, J. M. (1937). The general theory of employment. *The quarterly journal of economics*, *51*(2), 209-223.

Kirschen, E. S., Bénard, J., Besters, H., Blackaby, F., Eckstein, O., Faaland, J., et al. (1964). *Economic policy in our time*. Amsterdam: North-Holland.

Lindbeck, A. (1976). Stabilization policy in open economies with endogenous politicians. *The American Economic Review*, *66*(2), 1-19.

Lohmann, S. (1998). Rationalizing the political business cycle: a workhorse model. *Economics and Politics*, *10*(1), 1–17.

Mink, M., and De Haan, J. (2006). Are there political budget cycles in the euro area?. *European Union Politics*, *7*(2), 191-211.

Mohammad, S. M., Kiritchenko, S., and Zhu, X. (2013). NRC-Canada: Building the state-of-the-art in sentiment analysis of tweets. *arXiv preprint arXiv:1308.6242*.

Nordhaus, W. D. (1975). The political business cycle. *The review of economic studies*, *42*(2), 169-190.

Nordhaus, W. D., Alesina, A., and Schultze, C. L. (1989). Alternative approaches to the political business cycle. *Brookings papers on economic activity*, *1989*(2), 1-68.

Persson, T., and Tabellini, G. (2000). *Political economics: explaining economic policy*. Cambridge, MA: MIT Press.

Persson, T., and Tabellini, G. (2003). *The economic effects of constitutions: what do the data say*. Cambridge, MA and London: MIT Press.

ProDemos. (2021). *Recordaantal gebruikers voor StemWijzer: 7,8 miljoen.* https://prodemos.nl/nieuws/recordaantal-gebruikers-voor-stemwijzer-78-miljoen/.

Remmer, K. L. (2007). The political economy of patronage: Expenditure patterns in the Argentine provinces, 1983–2003. *The Journal of Politics*, *69*(2), 363-377.

Rogoff, K., and Sibert, A. (1988). Elections and macro-economic policy cycle. *Review of Economic Studies, 55*(1), 1–16.

Rogoff, K. (1990). Equilibrium political budget cycles. *American Economic Review, 80*(1), 21–36.

Schneider, C. J. (2010). Fighting with one hand tied behind the back: political budget cycles in the West German states. *Public choice*, *142*(1), 125-150.

Schultz, K. A. (1995). The politics of the political business cycle. *British Journal of Political Science*, *25*(1), 79-99.

Schwalbach, J. (2022). Going in circles? The influence of the electoral cycle on the party behaviour in parliament. *European Political Science Review*, *14*(1), 36-55.

Swank, O. H., and Swank, J. (1993). In search of the motives behind US fiscal macroeconomic policy. *Applied Economics*, *25*(8), 1013-1022.

Tufte, E. R. (1978). *Political control of the economy*. Princeton: Princeton University Press.

UK Parliament. (2022, May 13). *General elections*. Accessed on May 13, 2022, from https://www.parliament.uk/about/how/elections-and-voting/general/.

Van Dalen, H. P., and Swank, O. H. (1996). Government spending cycles: Ideological or opportunistic?. *Public Choice*, *89*(1), 183-200.

Vergne, C. (2009). Democracy, elections and allocation of public expenditures in developing countries. *European Journal of Political Economy*, *25*(1), 63-77.

Wittman, D. (1977). Candidates with policy preferences: A dynamic model. *Journal of economic Theory*, *14*(1), 180-189.

Wittman, D. (1983). Candidate motivation: A synthesis of alternative theories. *American Political science review*, *77*(1), 142-157.

Appendix A

Table A1

Dictionary: Word list with expansionary and contractionary policy indicators

Expansionary policy words	Contractionary policy words
banengroei	belastingstijging
begrotingstekort	belastingverhoging
belastingverlaging	bezuinigd
btw-verlaging	bezuinigde
contractloonstijging	bezuinigen
geïnvesteerd	bezuiniging
groei	bezuinigingen
groeien	bezuinigingsmaatregel
groeit	bezuinigingsmodus
inflatie	bezuinigt
investeer	btw-verhoging
investeerde	crisis
investeerden	daling
investeren	deflatie
investering	koopkrachtdaling
investeringen	kredietcrisis
koopkrachtreparatie	krimp
koopkrachtstijging	krimpen
lastenverlichting	krimpt
loonindexatie	loonsdaling
loonstijging	loonsverlaging
loonsverhoging	prijsinstabiliteit
nettolastenverlichting	recessie
overheidsuitgaven	rentestijging
prijsstabiliteit	renteverhoging
renteverlagen	salarisdaling
renteverlaging	salarisverlaging
salarisstijging	schaars
salarisverhoging	schaarste
stimuleer	tekort
stimuleert	vpb-verhoging
stimuleren	waardeverminderend
tegemoetkomen	waardevermindering
tegemoetkoming	wegbezuinigd
tegemoetkomt	wegbezuinigen
uitgaven	werkloos
uitgeven	werkloosheid
vpb-verlaging	werklozen
werkgelegenheidseffect	

Table A1 shows the words used in the dictionary-based content analysis, categorized as expansionary policy words and contractionary policy words.

Table A2

Ministers who spoke in the House of Representatives during the debates after Prince's Day

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Minister department									
Algemene Zaken	Rutte	Rutte	Rutte	Rutte	Rutte	Rutte	Rutte	Rutte	Rutte
Binnenlandse Zaken en Koninkrijksrelaties	Plasterk		Plasterk		Plasterk	Ollongren	Ollongren		
Veiligheid en Justitie	Opstelten	Opstelten	Van der Steur	Van der Steur	Blok		Grapperhaus	Grapperhaus	
Volksgezondheid (Welzijn en Sport)	Schippers			Schippers	Schippers	Bruins		De Jonge	
Buitenlandse Zaken	Timmermans				Koenders	Blok			
Wonen en Rijksdienst	Blok	Blok	Blok	Blok					
Defensie	Hennis-Plasschaert		Hennis-Plasschaert						
Inrfastructuur en Waterstaat	Schultz van Haegen	Schultz van Haegen			Schultz van Haegen	Van Nieuwenhuizen		Van Nieuwenhuizen	
Buitenlandse Handel en Ontwikkelings-samenwerkingen			Ploumen		Ploumen	Kaag		Kaag	De Bruijn
Sociale Zaken en Werkgelegenheid				Asscher	Asscher	Koolmees			
Economische Zaken (en Klimaat)					Kamp	Wiebes			
Financiën							Hoekstra	Hoekstra	
Landbouw, Natuur en Voedselkwaliteit									Schouten
Basis en Voortgezet Onderwijs en Media									Slob

Table A2 shows which ministers and from which departments spoke in (one of the) first three debates after Prince's Day in the House of Representatives.

Table A3

State secretaries who spoke in the House of Representatives during the debates after Prince's Day

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
State secretary department									
Economische Zaken (en Klimaat)	Dijksma		Dijksma			Keijzer	Keijzer		Yeşilgöz-Zegerius
Sociale Zaken en Werkgelegenheid	Klijnsma		Klijnsma		Klijnsma		Van Ark		
Veiligheid en Justitie	Teeven								
Financiën	Weekers	Wiebes		Wiebes					Vijlbrief
Volksgezondheid, Welzijn en Sport		Van Rijn							
Infrastructuur en Waterstaat					Dijksma	Van Veldhoven			
Defensie						Visser			

Table A3 shows which state secretaries and from which departments spoke in (one of the) first three debates after Prince's Day in the House of Representatives.

Table A4

Variable description overview

Variable	Variable Description
Election	This is a dummy variable that is equal to 1 when elections for the House of Representatives are approaching within the next 12 months after the debate. For the debates in September 2016 and September 2020, *Election* equals 1 as elections were held in March 2017 and March 2021. The variable equals 0 otherwise.
Coalition	This is a dummy variable that is equal to 1 when a party was part of the coalition at the moment the debate took place, and 0 otherwise. For the PvdA, *Coalition* equals 1 for the years 2013-2016. For CDA, ChristenUnie and D66, *Coalition* equals 1 for the years 2017-2021. For the VVD, *Coalition* equals 1 for the years 2013-2021. This corresponds with the green blocks in Table 1.
TotalWords	This variable counts the total number of words spoken in a debate per party, minister, or state secretary. All numbers and interpunction are removed from the text.
UniqueWords	This variable counts the total number of unique words spoken in a debate per party, minister, or state secretary. All numbers and interpunction are removed from the text.
LexDiv	This variable calculates the lexical diversity per debate per party, minister, or state secretary. The lexical diversity is calculated as *UniqueWords* divided by *TotalWords*.
PolicyWords	This variable counts the total number of policy words spoken in a debate per party, minister, or state secretary. The policy words are classified as either the expansionary policy words or the contractionary policy words shown in Table A1. Dictionary-based text analysis is used to match the words in the debates to the words in Table A1.
PropExpansionary	This variable calculates which proportion of the policy words consists of words indicating expansionary policy, according to Table A1. The variable is calculated as the total number of expansionary policy words per debate per party, minister, or state secretary, divided by *PolicyWords*.
PropContractionary	This variable calculates which proportion of the policy words consists of words indicating contractionary policy, according to Table A1. The variable is calculated as the total number of contractionary policy words per debate per party, minister, or state secretary, divided by *PolicyWords*.
EmotionWords	This variable counts the total number of emotion words spoken in a debate per party, minister, or state secretary. Dictionary-based text analysis is used to match the words in the debates to the words in the NRC Emotion Lexicon. The emotion words can be classified in one of the eight categories: anger, anticipation, disgust, fear, joy, sadness, surprise, or trust.
SentiWords	This variable counts the total number of sentiment words spoken in a debate per party, minister, or state secretary. Dictionary-based text analysis is used to match the words in the debates to the words in the NRC Emotion Lexicon. The sentiment words can be classified in one of the two categories: negative or positive.
PropAnger	This variable calculates which proportion of the emotion words per debate per party, minister, or state secretary consists of words in the emotion category "anger", according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with the category "anger" per debate per party, minister, or state secretary, divided by *EmotionWords*.
PropAnticipation	This variable calculates which proportion of the emotion words per debate per party, minister, or state secretary consists of words in the emotion category "anticipation", according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with the category "anticipation" per debate per party, minister, or state secretary, divided by *EmotionWords*.
PropDisgust	This variable calculates which proportion of the emotion words per debate per party, minister, or state secretary consists of words in the emotion category "disgust", according to the NRC Emotion Lexicon. The variable is calculated as the total number

	of words matched with the category "disgust" per debate per party, minister, or state secretary, divided by *EmotionWords*.
PropFear	This variable calculates which proportion of the emotion words per debate per party, minister, or state secretary consists of words in the emotion category "fear", according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with the category "fear" per debate per party, minister, or state secretary, divided by *EmotionWords*.
PropJoy	This variable calculates which proportion of the emotion words per debate per party, minister, or state secretary consists of words in the emotion category "joy", according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with the category "joy" per debate per party, minister, or state secretary, divided by *EmotionWords*.
PropSadness	This variable calculates which proportion of the emotion words per debate per party, minister, or state secretary consists of words in the emotion category "sadness", according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with the category "sadness" per debate per party, minister, or state secretary, divided by *EmotionWords*.
PropSurprise	This variable calculates which proportion of the emotion words per debate per party, minister, or state secretary consists of words in the emotion category "surprise", according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with the category "surprise" per debate per party, minister, or state secretary, divided by *EmotionWords*.
PropTrust	This variable calculates which proportion of the emotion words per debate per party, minister, or state secretary consists of words in the emotion category "trust", according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with the category "trust" per debate per party, minister, or state secretary, divided by *EmotionWords*.
PropNegative	This variable calculates which proportion of the sentiment words per debate per party, minister, or state secretary consists of words in the emotion category "negative", according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with the category "negative" per debate per party, minister, or state secretary, divided by *SentiWords*.
PropPositive	This variable calculates which proportion of the sentiment words per debate per party, minister, or state secretary consists of words in the emotion category "positive", according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with the category "positive" per debate per party, minister, or state secretary, divided by *SentiWords*.
PropEmotionWords	This variable calculates which proportion of the total words per debate per party, minister, or state secretary consists of emotion words, according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with one of the emotion categories per debate per party, minister, or state secretary, divided by *TotalWords*.
PropSentiWords	This variable calculates which proportion of the total words per debate per party, minister, or state secretary consists of sentiment words, according to the NRC Emotion Lexicon. The variable is calculated as the total number of words matched with one of the sentiment categories per debate per party, minister, or state secretary, divided by *TotalWords*.

Table A4 shows the description of all variables used in the dictionary-based quantitative text analyses. It also presents how some variables are calculated or combined.