Coalition-directed Voting as a Lottery

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Abstract

When voters support parties in multi-party democracies it is often uncertain what coalition government the party is likely to join. Are voters adversely affected by this type of uncertainty? In this paper, we present observational and experimental results that support the idea that voters are risk averse when considering coalition government options. The perception of uncertain coalition outlooks of a party negatively affects the propensity to vote for parties in survey data, even when holding the expected coalition government payoffs constant. In a survey vignette experiment during the German federal election 2021, we replicate this pattern for the CDU/CSU. Uncertain coalition outlooks reduce the propensity to support the CDU/CSU, compared to certain coalition outlooks with the same expected coalition government payoffs. The findings provide important insights for research on strategic voting theories and parties' coalition strategies.

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1. Introduction

Does it matter that voting a government into office often becomes a lottery? Democracies with proportional electoral systems around the globe are usually governed by coalition governments. Comparative political scientists and democratic theorists have discussed the potential of accountability and representation in those systems (Kam, Bertelli and Held; 2020; Powell and Powell Jr; 2000; Ganghof; 2016). One central threat to accountability is that "elections in polities characterized by coalition governments present uncertainty for voters" (Bargsted and Kedar; 2009, p.207). When voters support a party it is not entirely clear what government comes with it. In the last German Federal Elections, for example, voters of the Christian Democratic Union (CDU/CSU) were uncertain if the CDU/CSU could end up in a coalition with the Greens and the Liberals (Jamaica-coalition), or continue a grand coalition with the Social Democratic Party. The uncertainty about post-electoral government formation has informed studies that aim to understand how voters consider the coalition outcomes in their election decisions (Duch, May and Armstrong; 2010; Bargsted and Kedar; 2009; Kedar; 2005; Blais, Aldrich, Indridason and Levine; 2006).

But are voters adversely affected by the uncertainty that origins from different coalition options? Would they prefer more certain coalition outcomes? In many coalition-directed voting theories it is implicitly assumed that voters are risk averse when it comes to the uncertainty which potential coalitions options will form. For example, Duch et al. (2010) assume a quadratic utility function that generally implies risk averse behaviour (see also Armstrong and Duch; 2010). The same holds for recent studies that show that coalition signals change voters' behavior by shifting their expectations about which coalition options are likely to form after the election (e.g., Bahnsen, Gschwend and Stoetzer; 2020). The assumption also matters for related research fields. For example, one premise of Golder's (2005) study of pre-electoral coalitions is that voters are risk averse and gener-

ally prefer more certain coalition prospects of a party.[1]

In this paper, we ask the question if voters are risk averse when considering the coalition government options of parties. The starting point of our theoretical considerations are expected utility models for coalition-directed voting in multiparty democracies. In these models, voters evaluate parties not only based on a party itself but also based on the evaluation of coalition governments a party is likely to end up in (Duch et al.; 2010; Gschwend, Meffert and Stoetzer; 2017). The model creates an analogy to a lottery, in which the coalition likelihoods are represented by a perceived probability for coalition governments that are associated with particular government payoffs. In the expected utility model the question if voters are risk averse is decided by the functional form of the utility function for the government payoffs. We make use of two theoretical implications to infer risk preferences empirically. First, we rely on the relationship of the expected utility model to the mean-variance approach (Markowitz; 1952). Under mild approximation assumptions, we can show that coalition-directed voting is risk averse if the variance of the government probabilities affects party evaluation, next to the expected coalition government payoffs. Second, we work with a specific constellation of coalition lotteries that are mean-preserving spreads of one another. This permits us to isolate experimental situations in which we would expect risk aversion to matter for coalition-directed voting.

Equipped with the theoretical considerations, we present survey evidence that voters are risk averse when it comes to coalition-directed decisions. We field two surveys in Sweden and New Zealand during the last general elections. The surveys contain the necessary measures about the propensity to vote, the perceived government probabilities, and associated government payoffs. Based on the measures we calculate the expected government payoff and the variance of the government-probabilities and use linear regression models to estimate the effects. The results reveal that voters are risk averse, as

[1] In other studies of political science these type of questions have been front and center. How do voters react to the uncertainty from ambiguous policy platforms (Berinsky, Lewis et al.; 2007; Tomz and Van Houweling; 2009)? How do risk averse parties react to losses after election results (Somer-Topcu; 2009)?

they are more likely to vote for a party if it is more certain what coalition government a party is likely to enter - holding the expected government payoffs constant. We discuss and control for potential confounders, such as partisan misperceptions of coalition governments, and find the general conclusions to hold.

Next to the observational survey results, we present results from a vignette survey experiment conducted during the German Federal elections of 2021. In the within-subject vignette study we ask respondents about their propensity to vote for the CDU/CSU and the Greens under three mean-preserving spreads of coalition government scenarios. We determine the respondent-specific vignette scenarios based on questions about the perceived government probabilities and associated government payoffs for the CDU/CSU and the Greens. The pre-registered analysis confirms results that voters are risk averse. A scenario where the CDU/CSU enters a particular coalition government with certainty results in a higher propensity to vote, compared to the two "uncertainty" scenarios where two additional coalition government options (that preserve the expected government payoff) are feasible. We do not find a similar effect for the Greens, only some tentative results when analysing the effects among respondents with a certain propensity to vote for the Greens before the experiment (pre-registered). The results provide evidence that particular voters who consider the party a viable voting option, are risk averse when considering coalition governing chances.

The finding that voters are risk-averse has implications for our understanding of party competition and electoral institutions. The uncertainty that exists in electoral systems where voters can not choose their government directly on average negatively affects the voters' evaluations of parties. Our researcher thereby speaks to informal institutions that influence the predictability of the coalition government formation process. One informal institution are pre-electoral coalitions and coalition signals (Gschwend et al.; 2017; Golder; 2005). Parties that clearly signal what governments they are willing to enter reduce the uncertainty on the side of risk averse voters. The findings are also

meaningful for our understanding of party competition and the incentives for parties to signal their coalition options to voters (Gschwend, Indridason and Stoetzer; 2019).

2. Theory

There is an analogy between voting in proportional systems with coalition governments and participating in a lottery. Both coalition-directed voting for a party and buying a lottery ticket are choices under uncertainty, as in both cases it is unclear what the final outcome will be. When voting in proportional systems, the final outcome of interest is the government ultimately formed (see, e.g., Bargsted and Kedar; 2009; Duch et al.; 2010; Gschwend et al.; 2017; Kedar; 2005) and how much the voter benefits from this, while when participating in a lottery, it is money. Just as it is uncertain how much money a lottery will bring in, it is typically uncertain in which coalition government a chosen party will end up in. For example, when voting for the ÖVP in the 2017 Austrian general election, one did not know in advance whether the ÖVP would end up in an ÖVP-SPÖ government, an ÖVP-FPÖ government, an ÖVP minority government or no government. Therefore, if voters care about the next government, choosing a party to vote for from a set of different parties is conceptually like choosing a lottery to buy from a set of different lotteries.

Just as the decision to buy a lottery ticket is shaped by risk preferences, risk preferences should also play a decisive role for voting in proportional systems. Risk averse (risk seeking) voters should be more likely to vote for a party the more certain (uncertain) these voters are about which government that party will enter after the election, all else being equal. Note that the voters' expectations about which government a party will enter are shaped by that party's pre-electoral coalition signals (e.g., Bahnsen et al.; 2020; Falcó-Gimeno and Muñoz; 2017) or pre-electoral opinion polls (Stoetzer and Orlowski; 2020). While there is extensive evidence indicating that adult individuals are on average risk averse when it comes to monetary gambles (e.g., Paulsen, Platt, Huettel

and Brannon; 2012), there is as yet no evidence on whether individuals are risk averse, risk seeking, or risk neutral in regard to coalition-directed voting.

Expected utility theory provides us with a framework for describing decisions under uncertainty, such as coalition-directed voting in proportional systems. This helps us to derive expectations about what would be observed if voters were risk averse when considering coalition government options. At the heart of expected utility theory is the concept of the lottery, where in the present application we speak of *government lotteries*. For voter i, voting for party j means participating in government lottery $L_{i,j}$. This lottery is characterized by the different (coalition) governments party j could enter after the election (*government outcomes*), $c_{j_1}, \ldots, c_{j_N}$, and the perceived probabilities that party j would enter these governments after the election conditional on being in the government at all (*government probabilities*), $\gamma_{i,c_{j_1}}, \ldots, \gamma_{i,c_{j_N}}$, with $\sum_k \gamma_{i,c_{j_k}} = 1$. Voter i derives *government payoffs*, $Z_{i,c_{j_1}}, \ldots, Z_{i,c_{j_N}} \in \mathbb{R}$, from these government outcomes, depending on how much she likes the different governments party j could enter. The government payoffs are ordered such that $Z_{i,c_{j_1}} \leq Z_{i,c_{j_2}} \leq \cdots \leq Z_{i,c_{j_N}}$. We denote the government lottery by

$$L_{i,j} = \{\gamma_{i,c_{j_1}}, Z_{i,c_{j_1}}; \ldots; \gamma_{i,c_{j_N}}, Z_{i,c_{j_N}}\} \tag{1}$$

To stay with the example of the 2017 Austrian general election, voting for the ÖVP meant participating in lottery $L_{i,\ddot{O}VP} = \{\gamma_{i,\ddot{O}VP}, Z_{i,\ddot{O}VP};\ \gamma_{i,\ddot{O}VP-SP\ddot{O}}, Z_{i,\ddot{O}VP-SP\ddot{O}};\ \gamma_{i,\ddot{O}VP-FP\ddot{O}}, Z_{i,\ddot{O}VP-FP\ddot{O}}\}$.[2] Analogously, a vote for the SPÖ (FPÖ) would have meant participating in lottery $L_{i,SP\ddot{O}}$ ($L_{i,FP\ddot{O}}$) (see Figure 1). It should be noted that government probabilities and government outcomes are *perceived* quantities and thus individual-specific, as indicated by the subscripts.

According to expected utility theory, voters seek to maximize expected utility when

[2]For the sake of simplicity, we assume that there were no other governments, the ÖVP could have entered after the election.

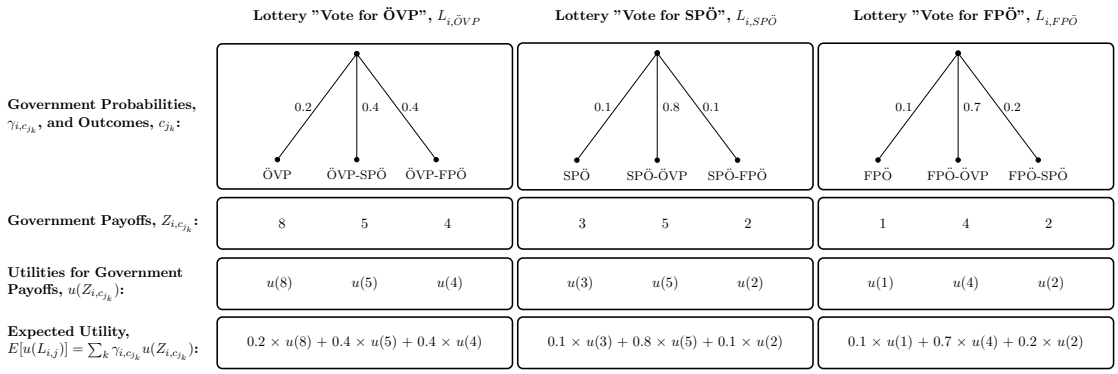

Figure 1: Example for government lotteries in the 2017 Austrian legislative election for a fictional voter i.

choosing a party to vote for from a set of different parties. The expected utility voter i derives from government lottery $L_{i,j}$, $E[u(L_{i,j})]$, is

$$E[u(L_{i,j})] = \sum_k \gamma_{i,c_{j_k}} u(Z_{i,c_{j_k}}), \tag{2}$$

where an increasing and continuous (Mas-Colell, Whinston, Green et al.; 1995, p. 185) utility function $u(\cdot)$ describes how much utility the voter derives from different government payoffs. Note that it is important to differentiate between utility function $u(\cdot)$ and the expected utility function $E[u(\cdot)]$. While $u(\cdot)$ indicates utility derived from government *payoffs*, $E[u(\cdot)]$ indicates utility derived from government *lotteries*. For better distinction, $u(\cdot)$ is typically called *Bernoulli utility function* whereas $E[u(\cdot)]$ is called *von Neumann-Morgenstern utility function* (see also Mas-Colell et al.; 1995, p. 184). Also note the difference between the *expected utility* of government lottery $L_{i,j}$, $E[u(L_{i,j})]$ and the *expected value* of government lottery $L_{i,j}$, $E[L_{i,j}]$. In the previously used example from the 2017 Austrian parliamentary election, maximising expected utility means comparing the expected utilities for the different government lotteries, $E[u(L_{i,\ddot{O}VP})]$, $E[u(L_{i,SP\ddot{O}})]$, $E[u(L_{i,FP\ddot{O}})]$, and voting for the party whose government lottery has the highest expected utility.

The risk preferences of the voter i in the coalition choice are determined by the functional form of the Bernoulli utility function $u(\cdot)$. Voter i is risk averse if and only if $u(\cdot)$ is concave. She is risk seeking if and only if $u(\cdot)$ is convex and risk neutral if and only if $u(\cdot)$ is linear. Unfortunately, we do not know the functional form and, thus, can not directly infer the voter's risk preferences. The literature on coalition-directed voting typically assumes a functional form of $u(\cdot)$ that implies risk aversion. For example, Duch et al. (2010) and Golder (2006, p. 39) suppose convex Bernoulli utility functions.

Coalition lotteries are not the only aspect that influence the evaluation of political parties, but prior research shows that they can certainly matter. How can we incorporate them in an encompassing voting decision model to understand their effect? For this we further define $V_{i,j}$ as the utility of a voter receives from voting for a party. We suppose that overall assessment of party a mixture of party and coalition considerations (in our case lotteries): $V_{i,j} = f(P_{i,j}, E[u(L_{i,j})])$, where P_ij are party considerations and $E[u(L_{i,j})]$ the expected value of the coalition lottery. Then we would have a complete choice model.

How can we infer risk preferences without knowing the Bernoulli utility function $u(\cdot)$? We discuss two different approaches that are relevant for our empirical strategies: (1) the mean-variance approximation (used in Section 3) and (2) the concept of the mean-preserving spread (used in Section 4).

2.1. Mean-variance approximation

We make use of the mean-variance approach originating from financial economics and mathematical finance (Markowitz; 1952). The idea is to approximate expected utility $E[u(L_{i,j})]$ by a function of the mean of the lottery, $E[L_{i,j}]$, and the variance of the lottery, $Var[L_{i,j}]$, which are two quantities that we can directly observe in public opinion surveys. This is done by a second-order Taylor-series approximation of $u(L_{i,j})$ at the mean of the government lottery, $E[L_{i,j}]$ (Levy and Markowitz; 1979), providing us with the following

expression:

$$u(L_{i,j}) \approx u(E[L_{i,j}]) + (L_{i,j} - E[L_{i,j}])u'(E[L_{i,j}]) + \frac{1}{2}(L_{i,j} - E[L_{i,j}])^2 u''(E[L_{i,j}]) \quad (3)$$

Taking the expected value of this approximation directly yields the following approximation for expected utility $E[u(L_{i,j})]$:[3]

$$E[u(L_{i,j})] \approx u(E[L_{i,j}]) + \frac{1}{2}E[(L_{i,j} - E[L_{i,j}])^2]u''(E[L_{i,j}]) \quad (4)$$

$$\approx u(E[L_{i,j}]) + \frac{1}{2}Var[L_{i,j}]u''(E[L_{i,j}]) \quad (5)$$

With this mean-variance approximation we can evaluate whether voter i is risk averse, risk neutral or risk seeking without knowing the functional form of $u(\cdot)$ and instead consider the marginal effect of the lottery's variance on expected utility,

$$\frac{\mathrm{d}E[u(L_{i,j})]}{\mathrm{d}Var[L_{i,j}]} \approx \frac{1}{2}u''(E[L_{i,j}]). \quad (6)$$

If this marginal effect is negative, voter i is risk avers, because risk aversion implies a concave Bernoulli utility function and hence $u''(\cdot) < 0$. If this marginal effect is positive, voter i is risk seeking, because risk seeking implies a convex Bernoulli utility function and hence $u''(\cdot) > 0$. If this marginal effect is equal to zero, voter i is risk neutral, because risk neutrality implies a linear Bernoulli utility function and hence $u''(\cdot) = 0$.

Also when we consider a complete choice model $V_{i,j}$ by additionally taking party considerations into account (see above), the marginal effect of the lottery's variance still provides us with information on voter i's risk preferences. This is, because the marginal effect of the lottery's variance on voting utility $V_{i,j}$ is $\frac{\mathrm{d}V_{i,j}}{\mathrm{d}Var[L_{i,j}]} = \frac{\mathrm{d}f(P_{i,j},E[u(L_{i,j})])}{\mathrm{d}Var[L_{i,j}]} = \frac{\mathrm{d}f(P_{i,j},E[u(L_{i,j})])}{\mathrm{d}E[u(L_{i,j})]}\frac{\mathrm{d}E[u(L_{i,j})]}{\mathrm{d}Var[L_{i,j}]}$. Since we assume $\frac{\mathrm{d}f(P_{i,j},E[u(L_{i,j})])}{\mathrm{d}E[u(L_{i,j})]} \geq 0$, this marginal effect

[3] Note that the mean-variance approach and expected utility theory are *exactly* equivalent if Bernoulli utility function $u(\cdot)$ is quadratic, i.e. $u(x) = bx + cx^2$ (see Hanoch and Levy; 1970). In this case, expected utility derived from a lottery is a function of the lottery's mean and variance: $E[u(L_{i,j})] = b\sum_k(\gamma_{i,c_{j_k}} Z_{i,c_{j_k}}) + c\sum_k(\gamma_{i,c_{j_k}} Z^2_{i,c_{j_k}}) = bE[L_{i,j}] + cE[L^2_{i,j}] = bE[L_{i,j}] + c(E[L_{i,j}]^2 + Var[L_{i,j}])$.

is to be interpreted in the same way as the marginal effect on the expected utility of the lottery alone. Note however, that the marginal effect of the variance will be equal zero, if $\frac{\mathrm{d}f(P_{i,j},E[u(L_{i,j})])}{\mathrm{d}E[u(L_{i,j})]} = 0$, i.e. if a voter attaches no importance to coalition-centered considerations.

We can exploit this observable implication of how risk preferences influence expected utilities to test whether voters are risk averse when it comes to coalition-directed voting. This is because we can empirically assess both the voters' expected utility derived from voting a specific party and voters' perceived variance of that party's government lottery. We will take advantage of this in Section 3.

2.2. Mean-preserving spreads

Another way to infer voters' risk preferences without making assumptions about the functional form of Bernoulli utility $u(\cdot)$ is to make use of the concept of the mean-preserving spread. Consider the situation in which a voter can decide between two government lotteries $L_{i,j}^{(1)}$ and $L_{i,j}^{(2)}$, where both lotteries have the same expected value such that $E[L_{i,j}^{(1)}] = E[L_{i,j}^{(2)}]$. Also assume that both government lotteries have the same government payoffs and only differ in their government probabilities, i.e. $L_{i,j}^{(1)} = \{\gamma_{i,c_{j_1}}^{(1)}, Z_{i,c_{j_1}}; \ldots; \gamma_{i,c_{j_N}}^{(1)}, Z_{i,c_{j_N}}\}$ and $L_{i,j}^{(2)} = \{\gamma_{i,c_{j_1}}^{(2)}, Z_{i,c_{j_1}}; \ldots; \gamma_{i,c_{j_N}}^{(2)}, Z_{i,c_{j_N}}\}$. Lottery $L_{i,j}^{(2)}$ is called a *mean-preserving spread* of $L_{i,j}^{(1)}$ if, for all $k \in [1, N-1]$, the following inequality holds (see, e.g., Courtault, Crettez and Hayek; 2006; Mas-Colell et al.; 1995, p. 197-199):

$$\sum_{m=1}^{k} \left(\sum_{p=1}^{m} \gamma_{i,c_{j_p}}^{(2)} - \sum_{p=1}^{m} \gamma_{i,c_{j_p}}^{(1)} \right) (Z_{i,c_{j_{m+1}}} - Z_{i,c_{j_m}}) \geq 0. \tag{7}$$

Simply put, this means that we can construct lottery $L_{i,j}^{(2)}$ out of lottery $L_{i,j}^{(1)}$ by reducing the probability of government outcomes with medium payoff and increasing the probability of government outcomes with extreme payoff (i.e. very small and very large payoff), while not changing the expected value of lottery $L_{i,j}^{(1)}$. Note that $L_{i,j}^{(2)}$ being a

mean-preserving spread of $L_{i,j}^{(1)}$ implies that $Var[L_{i,j}^{(2)}] > Var[L_{i,j}^{(1)}]$, however, in general, the reverse is not true.

From a voter's choice between lotteries $L_{i,j}^{(1)}$ and $L_{i,j}^{(2)}$ we can direct infer her risk preferences. If she chooses $L_{i,j}^{(1)}$, $u(\cdot)$ is concave, which implies risk aversion. If she chooses $L_{i,j}^{(2)}$, $u(\cdot)$ is convex, which implies risk seeking. If she is indifferent between the lotteries, $u(\cdot)$ is linear, which implies risk neutrality.

Also when we consider a complete choice model $V_{i,j}$, a voter's risk preferences should influence the choice between lotteries $L_{i,j}^{(1)}$ and $L_{i,j}^{(2)}$. However, if a voter does not make coalition-centered considerations at all when casting a vote, she will naturally be indifferent between the two lotteries.

We will exploit this observable implications of how risk preferences shape coalition-directed voting in Section 4.

3. Observational Evidence

In this section, we assess whether voters are risk averse, risk seeking, or risk neutral when it comes to coalition-directed voting by drawing evidence from surveys conducted in Sweden, New Zealand, and Germany.

3.1. Research Design

Our empirical strategy makes use of the mean-variance approximation of expected utility derived in Section 2 to draw inferences about the risk preferences of voters with respect to coalition-directed voting. How does the perceived variance of a party's government lottery affect voters expected utility derived from voting for this party (see Equation 6). If the effect of this variance is negative (positive; zero), we can infer that the average voter is risk averse (risk seeking; risk neutral). To this end, we need to capture voters' perceptions of government lotteries.

We rely on survey data from different countries with coalition governments (Sweden, New Zealand, and Germany) that provide us with the necessary information to assess voters' perceptions of government lotteries. These are survey data that include comprehensive measures of perceived government payoffs and perceived government probabilities. First, we use data from a survey that we conducted during the 2018 Swedish parliamentary election campaign (see Bahnsen et al.; 2020, for more information on this survey). The survey was fielded between June 12 and August 6, 2018, within the online panel of the Laboratory of Opinion Research (LORE) at the University of Gothenburg and included responses from a total of 1,907 respondents. In this survey, respondents answered questions about the various post-electoral government options of the Swedish Social Democratic Party and the Swedish Moderate Party, including the respondents' evaluations and perceived probabilities for these government options. Second, we use data of a survey that we fielded during the 2020 New Zealand general election campaign. Between October 8 and October 14, 2020, we recruited 458 respondents through Consumer Link's online panel. As part of the survey, we asked respondents about the government options the New Zealand Labour Party was likely to have after the election. In specific, we asked respondents to state their evaluations and perceived probabilities for the government options of this party. Third, we use two of the GLES (German Longitudinal Election Study) components, the GLES Longterm-Online-Tracking (GLES; 2019) for the German elections in 2017 (Wave 37) and in 2013 (Wave 21) and the GLES Cross Section (GLES; 2020) for the German elections in 2013 and 2009.

The key independent variable of our analysis is the perceived variance of a party's government lottery. We compute respondent i's perceived variance of party j's government lottery in the following way. For the different government options of party j, $c_{j_1}, \ldots, c_{j_N}$, we measure respondent i's perceived payoffs, $Z_{i,c_{j_1}}, \ldots, Z_{i,c_{j_N}}$, and perceived probabilities, $\gamma_{i,c_{j_1}}, \ldots, \gamma_{i,c_{j_N}}$.[4] As a measure for perceived government payoffs, we use survey

[4]Our data allow us to construct the government lotteries for different parties. In the survey data from New Zealand 2020, we focus on the New Zealand Labour Party (L) for which we have data on four

questions that asked respondents to evaluate different government options of party j on established like-dislike scales.[5] As a measure of the perceived government probabilities, we use survey questions that asked respondents to indicate their perceived probability of party j entering different governments.[6] Where available, we used questions that asked about the perceived probabilities that party j would enter different governments *conditional on being in the government at all*.[7] These conditional probabilities are closer to what constitutes the government probabilities defined in the theory section. We normalise the perceived probabilities by using the softmax function, which guarantees that each perceived probability lies within the interval $[0, 1]$ and that $\sum_k \gamma_{i,c_{j_k}} = 1$. We then calculate respondent i's perceived mean of party j's government lottery, $\mu_{i,j}$, by computing $\mu_{i,j} = \sum_k \gamma_{i,c_{j_k}} Z_{i,c_{j_k}}$. Finally, we calculate respondent i's perceived variance of party j's government lottery, $\sigma^2_{i,j}$, by computing $\sigma^2_{i,j} = \sum_k (Z_{i,c_{j_k}} - \mu_{i,j})^2 \gamma_{i,c_{j_k}}$.

The dependent variable of our analysis is the expected utility derived from voting for a party. Following van der Eijk, van der Brug, Kroh and Franklin (2006), we use *propensity to vote* questions to directly measure the utility that respondent i derives from party j. In the survey conducted in Sweden 2018, respondents indicated their propensities to vote for the Swedish Social Democratic Party and for the Moderate Party. In the survey conducted in New Zealand 2020, respondents stated their propensities to vote

different government options: a single-party government of the Labour Party, a L-Green, a L-ACT and a L-NZFirst coalition. In the survey data from Sweden 2018, we consider both the Swedish Social Democratic Party (SAP) and the Swedish Moderate Party (M). As for the Swedish Social Democratic Party, we have data on two different government options: a SAP-MP and a SAP-MP-L-C coalition. As for the Swedish Moderate Party, we have data on two different government options: a M-C-L-KD and a M-SD coalition. In the GLES survey data, we focus on the parties CDU/CSU, SPD, FDP and Greens for which we have data on different government options: a CDU/CSU-SPD, a SPD-Greens, a CDU/CSU-FDP, a SPD-Greens-Left, a CDU/CSU-Greens (only GLES Longterm-Online-Tracking component), a CDU/CSU-FDP-Greens and a SPD-FDP-Greens coalition.

[5] In the surveys from both Sweden 2018 and New Zealand 2020, respondents rated coalitions on a 7-point scale from 1 ("strongly dislike") to 7 ("strongly like"). The the GLES components, respondents rated coalitions on a 11-point scale from 1 ("not desirable at all") to 11 ("highly desirable").

[6] In the survey from Sweden 2018, respondents stated the perceived probability on a 7-point scale from 1 ("not likely at all") to 7 ("very likely"). In the survey from New Zealand 2020, respondents stated the perceived probability on a 7-point scale from 1 ("not very likely") to 7 ("very likely"). For the GLES components, respondents indicated which party they expected to vote for.

[7] Such questions were asked in the surveys from both Sweden 2018 and New Zealand 2020.

for the New Zealand Labour Party. In both surveys, respondents gave their answers on a scale from 1 ("not likely at all") to 7 ("very likely"). The GLES components under consideration do not include questions on voting propensity, so we consider the intended vote choice as the dependent variable.

Our aim is to draw model-based inference about how the perception of uncertain coalition outlooks of a party affects the propensity to vote for this party. For each party under consideration, we run a linear regression of the propensity to vote for the party on σ_j^2, which is the perceived variance of the party's government lottery. For the GLES data, we run linear probability models, i.e. linear regression of vote choice for the party on σ_j^2. In total there are seven parties under consideration: the New Zealand Labour Party (survey from New Zealand 2020), the Swedish Social Democratic Party, the Swedish Moderate Party (survey from Sweden 2018) and the German CSU/CSU, SPD, FDP and Green (GLES components). We control for μ_j, which is the perceived mean of the party's government lottery. We do this because it is a confounder that directly affects σ_j^2 as well as the dependent variable (see Equation 5 for why we expect the perceived lottery mean to affect our dependent variable). Also, individual partisan misperceptions could confound the effect of interest. This is because coalition expectations (and thus perceived government lottery variances) can be distorted by party evaluations in terms of "wishful thinking" (Meffert, Huber, Gschwend and Pappi; 2011). Therefore, we control for party evaluations, which we measured with like-dislike scales. In the surveys from both Sweden 2018 and New Zealand 2020, respondents rated parties on a 7-point scale from 1 ("strongly dislike") to 7 ("strongly like"). In the GLES components, respondents rated parties on a 11-point scale from 1 ("strongly dislike") to 11 ("strongly like"). We further control for gender, age, and education. In this way, the effect of interest can be estimated more precisely, as these are variables that directly influence our dependent variable.

3.2. Results

The analysis of survey data from New Zealand and Sweden strongly suggests that voters are risk *averse* when it comes to coalition-directed voting. SM A.1 shows the results of the linear regressions of propensities to vote on perceived government lottery variance while controlling among others for the perceived government lottery mean. The results indicate that the propensity to vote for a party is significantly negatively affected by the uncertainty of the party's coalition outlooks. This applies consistently to all three parties considered: the Moderate Party and the Social Democratic Party in the context of the 2018 Swedish parliamentary elections as well as the Labour Party in the 2020 New Zealand general election. Turning to the perceived government lottery mean, we find that is has an significantly positive effect on the propensity to vote for a party.

Also substantially, the results are significant. Figure 2 shows the average propensity to vote for different values of the government lottery variance - once for a low lottery variance and once for a high lottery variance. In the low variance scenario, we set the variance to the minimum possible value of 0, which mimics the situation where the party entered into a pre-election coalition. In the high variance scenario, we set the variance to the maximum possible value (9 in this case), which mimics the situation where the party could join a highly desirable coalition and a highly undesirable coalition with equal probability. On average and holding the government lottery mean and everything else constant, increasing the variance of a government lottery from minimum to maximum reduces the propensity to vote for the Swedish Social Democratic Party [Swedish Moderate Party; New Zealand Labour Party] by 1.539 [0.765; 1.485] points on a 7-point scale. This negative effect of variance suggests that expected-utility-maximizing voters have a concave Bernoulli utility function, indicating risk aversion in the context of coalition-driven voting.

Turning to the analysis of the GLES survey data, we also find suggestive evidence for risk aversion of voters when it comes to coalition-directed voting. SM A.2, A.3 and A.4

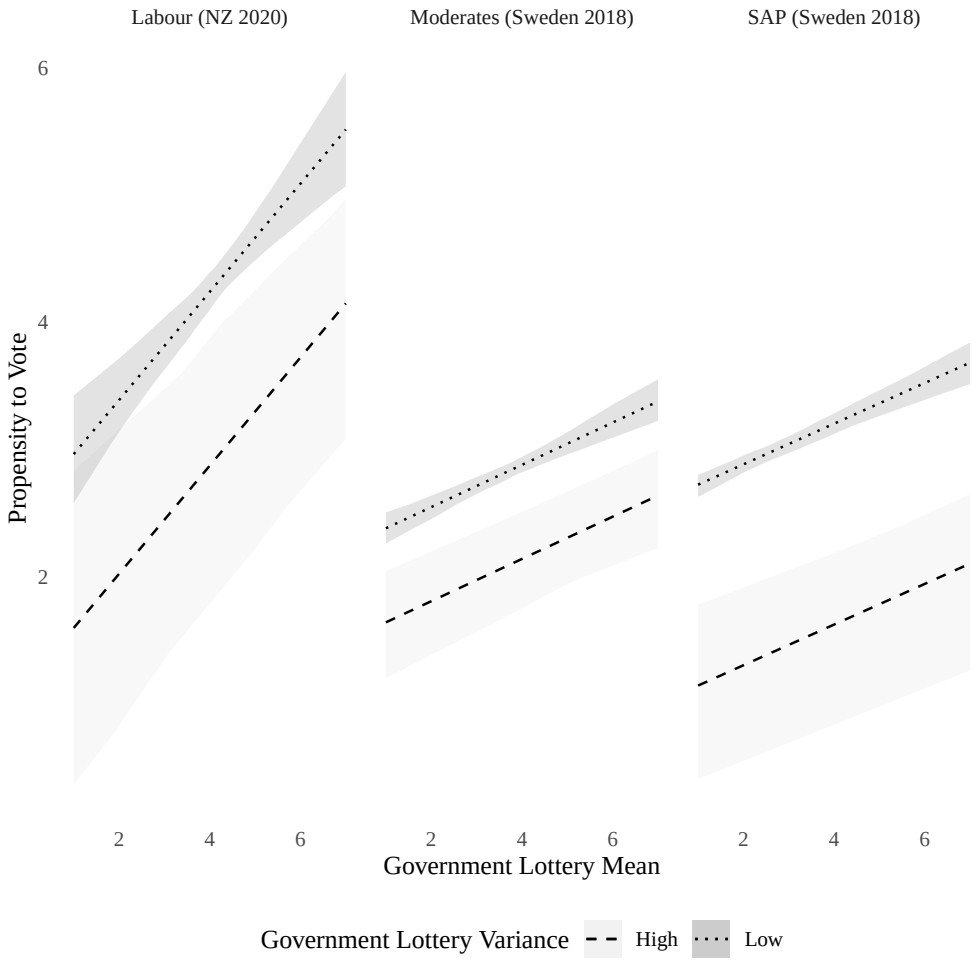

Figure 2: Average propensity to vote for the New Zealand Labour Party (2020), the Swedish Moderate Party and the Swedish Social Democratic Party (2018) for low and high variance of the government lottery.

Note: Results come from linear regressions of propensities to vote on perceived government lottery variance and mean. We control for the party evaluation as well as gender, age, and education. Shaded areas display 95% confidence intervals. For the computation of expected values, an observed-value-approach was used. In the low variance scenario, we set the variance to the minimum possible value of 0. In the high variance scenario, we set the variance to the maximum possible value (9 in this case).

show the results of the linear probability models, i.e. linear regressions of vote choice on perceived government lottery variance while controlling among others for the perceived government lottery mean (see also Figure 3). The propensity to vote for the CDU/CSU is significantly negatively affected by the uncertainty of its coalition outlooks both in

2017 and in 2013 (GLES Online Tracking), suggesting the presence of risk aversion. For the other parties, however, we find no consistently significant effects of the lottery variance. Since the effect of the government lottery mean also appears to be stronger for the CDU/CSU than for the other parties, this pattern could be explained by a greater importance of coalition-related considerations in voting for the CDU/CSU. As stated in the theory section, government lottery variance can only have an effect on voting utilities when coalition-centered considerations are sufficiently strong.

4. Experimental Evidence

In this section, we present results from experimental vignette study. In contrast to the observational study we present respondents with different scenarios. In this way, we manipulate the perception of coalition lotteries and assure that our findings in the previous section are not due to unobserved confounding.

4.1. Research Design

We field a survey for studying the role of risk preferences in coalition-directed voting decisions during the German Federal Elections 2021. The survey contains two within-subject experiments that allow us to test the hypothesis that voters are on average risk averse when considering coalition government options. The survey includes pre-treatment measures of sociodemographic characteristics and political orientations.[8]

We then introduce the general theme of the experiment: "After the federal election, there will probably be a coalition government" and ask respondents about their opinion of different coalition governments for the CDU/CSU first, and later for the Greens. We let them rate various coalition options of the CDU/CSU, on a scale from -5 to +5.[9] The survey includes such ratings of seven two-party and three-party government

[8] For a complete list of the items in the survey, please refer to the supplementary material (SM).

[9] The wording of the question is: "Regardless of the outcome of the Bundestag election, how desirable do you personally consider the following coalition governments?".

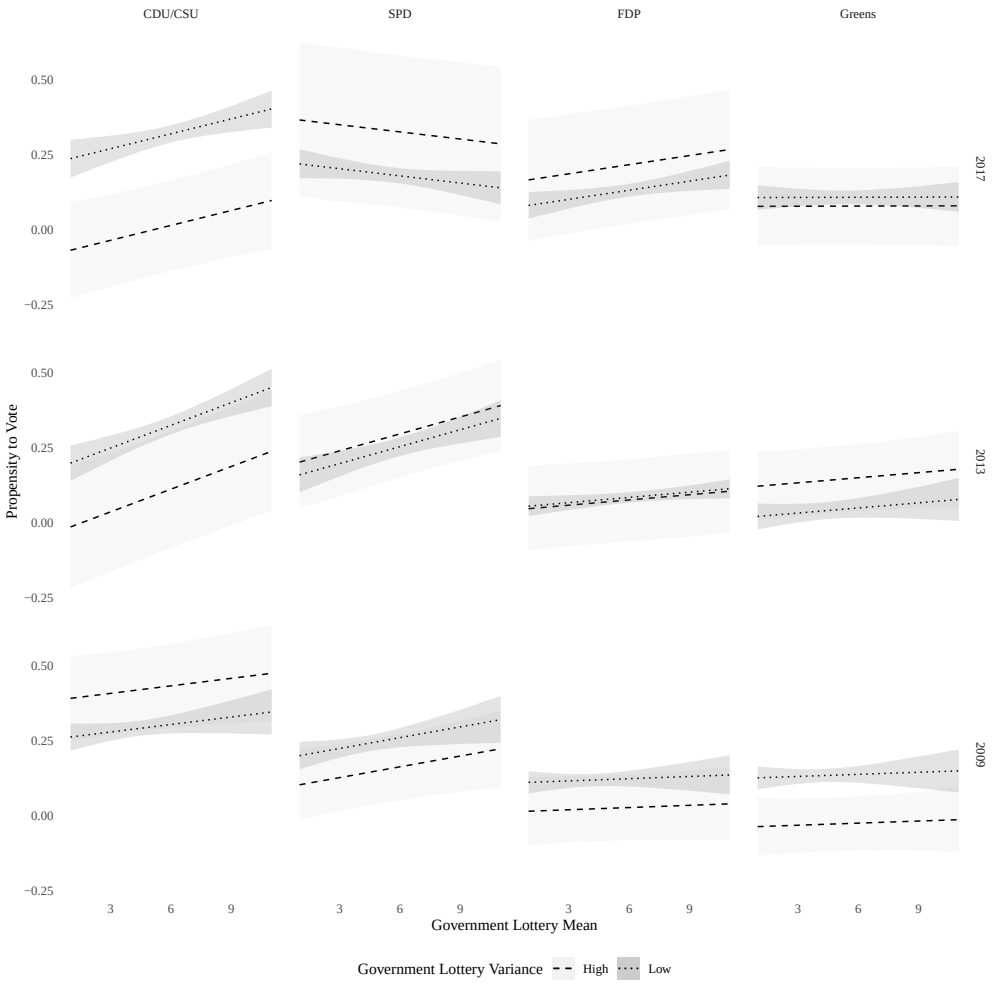

Figure 3: Average propensity to vote for the CDU/CSU, SPD, FDP, and Greens in 2017, 2013, and 2009 for low and high variance of the government lottery.

Note: Results come from linear regressions of vote choice on perceived government lottery variance and mean. We control for the party evaluation as well as gender, age, and education. Shaded areas display 95% confidence intervals. For the computation of expected values, an observed-value-approach was used. In the low variance scenario, we set the variance to the minimum possible value of 0. In the high variance scenario, we set the variance to the maximum possible value (25 in this case). For 2017 and 2013 (2009), results are based on the GLES Online Tracking (GLES Cross Section).

constellations. As in the observational study in the last section, this scale works as our measure of the coalition government payoffs. Afterwards, we ask respondents about the probabilities that a party will end up in a certain government coalition, i.e., their perceived coalition likelihoods. "Suppose the CDU/CSU is part of the next government.

In which coalition government is the CDU/CSU likely to be part of?" The scale ranges from 0 (very unlikely) to 10 (very likely). We re-scale the question by dividing each answer by the sum of all answers and use the respective values as our measure of perceived government probabilities. Afterwards, we ask respondents about their general propensity to vote for the CDU/CSU on a scale from 0 (very unlikely) to 10 (very likely).

For the experiment we choose three vignettes to describe different scenarios. A sentence introduces the three vignettes to respondents: "Below we present three different situations. We will ask you each time how likely it is that you would vote for the CDU/CSU." A detailed explanation of how to understand the probabilities follows the introduction. The three scenarios are calculated based on respondents' previous answers to the coalition government payoffs such that the three coalition lotteries have mean-preserving spreads (see Section 2.2). For this, we automatically choose three CDU/CSU coalition governments for each respondent: the coalition government with the lowest respondent evaluation, one with medium evaluation, and the one with the lowest evaluation.[10] The set of coalition governments that are part of the experiment varies between respondents.[11]

The first vignette presents a scenario in which only the medium coalition government is feasible due to the coalition signals of the party. "Imagine that the CDU/CSU says that after the election it will only enter into one coalition with [Coalition with medium rating] and that it will rule out all other coalitions." It assigns 100% to the probability of the medium coalition. The first vignette thereby presents a scenario with a certain coalition lottery, in which voters know what coalition government a party could end up in. The second vignette puts weight on the lowest and highest rated coalition government

[10] We found the coalition with medium evaluation by selecting the coalition with the median (lower median) evaluation. If there were several coalitions to which it applied, we selected one at random. Also, if there was more than one coalition that received the worst (best) rating, one of these coalitions was selected at random.

[11] In some unlikely cases it is not possible to choose three separate coalition governments, as respondents do not provide three distinct coalition government evaluations. These respondents are excluded from the experiment.

while preserving the expected government payoff.[12] This scenario is introduced "Now imagine if the CDU/CSU did not clearly state which coalition they would like to join after the election." The third vignette puts even more weight on the lowest and highest rated coalition government, such that only 1% chance for the medium remains.[13] The scenarios, thereby, present ever more uncertain coalition lotteries and allow us to directly estimate the effect of uncertainty on voting propensities, holding the expected coalition government payoffs constant.

The within-subject design is repeated with the Green party. We choose the Green party next to the CDU/CSU as early in the campaign (and during the field time) the Greens were perceived as the main competitor and closest to the CDU/CSU in the polls. The survey asks about five Green coalition governments and afterwards presents the three selected coalition lotteries for each respondent. The selection and calculation process for the coalition governments in the vignettes is the same as for the CDU/CSU. The experiment with the Greens might be compromised by the fact that towards the end of the campaign it became clear that the social democrats are the main competitor for the CDU/CSU. The social democrats in the end also became the largest party on the election day 26th of September.

The survey experiment and the analysis are pre-registered.[14] We recruit 1600 respondents from the online-access panel RespondI with quotas based on age, gender and region

[12] In the second vignette, we calculated the probabilities for the lowest rated coalition, $\gamma^{(2)}_{i,low}$, for the medium rated coalition, $\gamma^{(2)}_{i,med}$, and for the highest rated coalition, $\gamma^{(2)}_{i,high}$, according to the following formulas: $\gamma^{(2)}_{i,low} = \frac{Z_{i,med} - Z_{i,high}}{Z_{i,low} - Z_{i,high}} \frac{1}{2}$, $\gamma^{(2)}_{i,high} = \frac{\gamma^{(2)}_{i,low}(Z_{i,low} - Z_{i,med})}{Z_{i,med} - Z_{i,high}}$, and $\gamma^{(2)}_{i,med} = 1 - (\gamma^{(2)}_{i,low} + \gamma^{(2)}_{i,high})$. $Z_{i,low}$, $Z_{i,med}$, and $Z_{i,high}$ are the evaluations of the lowest rated, medium rated, and highest rated coalitions, respectively. These probabilities ensured that the government lottery displayed in the second vignette is a mean-preserving spread of the government lottery displayed in the first vignette.

[13] In the third vignette, we calculated the probabilities for the lowest rated coalition, $\gamma^{(3)}_{i,low}$, for the medium rated coalition, $\gamma^{(3)}_{i,med}$, and for the highest rated coalition, $\gamma^{(3)}_{i,high}$, according to the following formulas: $\gamma^{(3)}_{i,low} = \frac{Z_{i,med} - Z_{i,high}}{Z_{i,low} - Z_{i,high}} \frac{99}{100}$, $\gamma^{(3)}_{i,high} = \frac{\gamma^{(3)}_{i,low}(Z_{i,low} - Z_{i,med})}{Z_{i,med} - Z_{i,high}}$, and $\gamma^{(3)}_{i,med} = 1 - (\gamma^{(3)}_{i,low} + \gamma^{(3)}_{i,high})$. $Z_{i,low}$, $Z_{i,med}$, and $Z_{i,high}$ are the evaluations of the lowest rated, medium rated, and highest rated coalitions, respectively. These probabilities ensured that the government lottery displayed in the third vignette is a mean-preserving spread of both the government lottery displayed in the second vignette and the one shown in the first vignette.

[14] Please see https://osf.io/udvsb

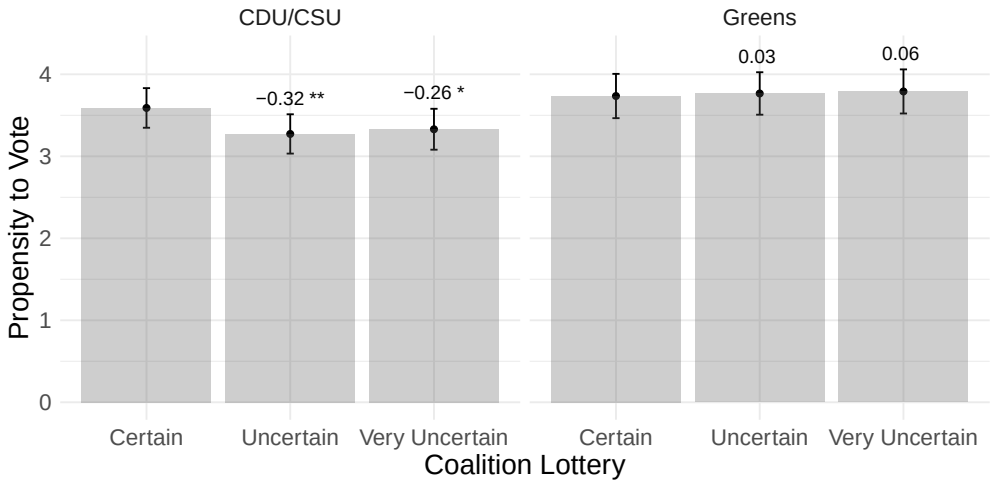

Figure 4: Average propensity to vote for the CDU/CSU and the Green Party for the different scenarios, with 95% confidence intervals. The values show treatment effects of the uncertain and very uncertain condition compared to the certain condition, alongside their p-value ($^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$)

(see SM B.1). The survey field time was between the 2nd of July and the 8th of August 2021. The median response to the survey took around 6 minutes, for which respondents received compensations from the panel provider.

4.2. Results

The first hypothesis is that average voters are risk averse. For the experimental study, this implies that respondents are more likely to vote for a party if the variance of the party-specific coalition lottery is lower compared to a scenario in which this variance is higher, holding constant the mean of the party-specific coalition lottery. Hence, we should observe higher support under the certain coalition scenarios, compared to the uncertain coalition scenarios.

The results support the notation that voters are risk averse when considering the coalition government options of the CDU/CSU. Figure 4 shows a negative treatment effect of the uncertain and very uncertain coalition lotteries compares to certain coalition government prospects. The effect is with around 1/3 scale points comparable between

the uncertain (-.32) and very uncertain coalition option (-0.26) and we can reject the null hypothesis for both. Our results imply that respondents systematically evaluate the CDU/CSU higher if the party signals which coalition government it intends to form. We do not find a difference between the uncertain and very uncertain coalition lottery - a difference we would also expect for risk averse voters. For the Greens, we do not find a clear difference between the three scenarios. The SM B.3 report on the regression tables and shows that this pattern holds when using two pre-registered alternative modelling strategies controlling for respondent and scenario-specific fixed effects.

An additional pre-registered hypothesis gives an indicative explanation for the inconclusive findings for the Greens and the difference between uncertain and very uncertain coalition lotteries. According to it, the treatment effect might be conditional on the initial propensity to vote for the parties. Only respondents who have some propensity to vote for the parties consider their coalition government options and, hence, react negatively to more uncertain coalition lotteries. We find some support for the hypothesis for respondents with a middle-level propensity to vote for the two parties. Figure 5 shows a decay of voting propensities over the three scenarios for the CDU/CSU for middle PTV. The difference between the certain and uncertain conditions is 0.68 scale points, for the very uncertain condition it is even 1.21 scale points. However, given the smaller number of cases in this analysis and the lower power, only the very strong decrease is statistically significant. For the Greens, we also observe a decay in the group of respondents who report a middle propensity to vote for them. We observe a decrease in the propensity to vote of 0.21 and 0.42, but again the number of cases in this group are too small to reach statistically significance at conventional levels.

We also evaluate upon the pre-registered hypothesis if the patterns are influenced by the risk preferences of the respondents. Risk averse behaviour should be particularly pronounced among respondents that indicate that they are not willing to take risks. For respondents that indicate that they are very willing to take a risk, we should even

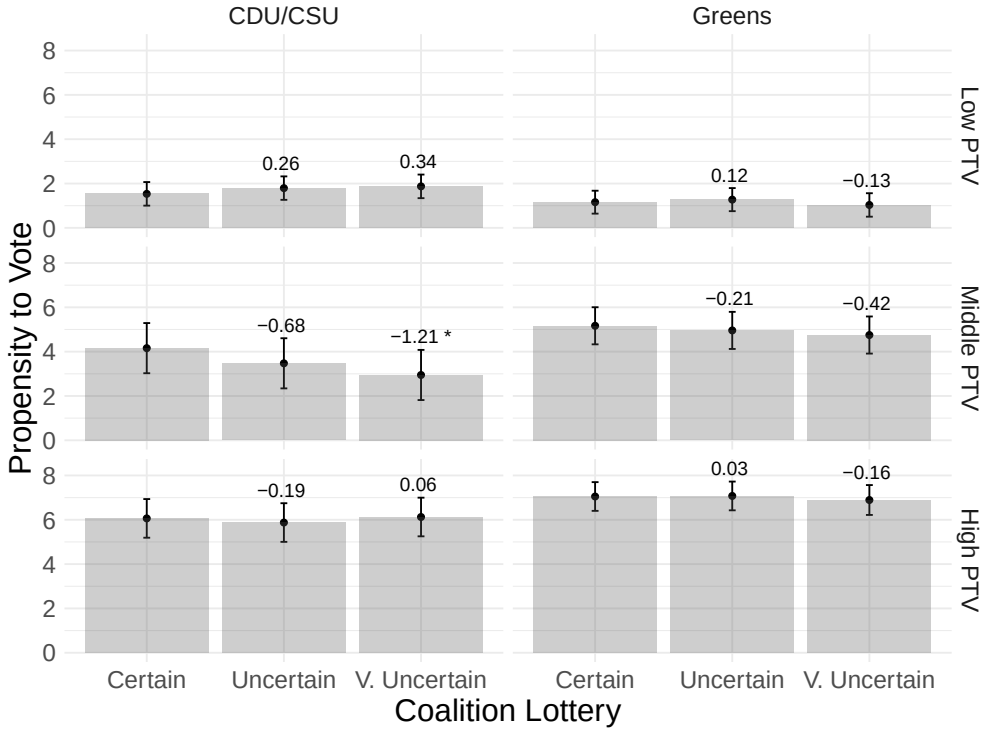

Figure 5: Average propensity to vote for the CDU/CSU and the Green Party for the different scenarios and conditional on propensity to vote (PTV) for party, with 95% confidence intervals. The values show treatment effects of the uncertain and very uncertain condition compared to the certain condition, alongside their p-value ($^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$)

observe risk seeking behaviour.[15] SM B.2 reveals some patterns that underline that the relationship is due to risk preferences. We find that the negative effect of uncertain and very uncertain coalition lotteries is particularly pronounced among respondents who are not willing to take risks. For respondents with medium levels of risk preferences, there is no difference between the scenarios. For the Greens, we also find that respondents with high-risk preferences are risk taking, as a very uncertain coalition lottery increases their propensity to vote for the Greens. But not all expectations in this analysis confirm the conditional hypothesis, e.g., we find no effects for the Greens among respondents with low-risk preferences and even some negative significant effects for respondents that are

[15]We use a standard survey question to ask about risk preferences for the respondents.

willing to seek risks for the CDU/CSU. Nonetheless, the results point in a direction that risk preferences can matter in this regard and confirm the idea that is truly about the uncertainty that originates from the different scenarios.

5. Discussion

In this paper, we show that on average voters are risk averse when it comes to the uncertainty that arises from coalition governments. Based on expected utility theory and mean-variance approach we identify conditions under which we expect risk preferences to influence voting decisions and evaluate them in observational survey research and an experimental study. The results show that even when holding the expected payoff from coalition government outcomes constant, voters prefer more certain outcomes.

Our findings have important implications for understanding accountability in systems where voters do not choose their party-governments directly. It shows that the uncertainty that originates from theses electoral intuitions negatively weighs on voters evaluation of parties and calls for informal institutions to reduce this type of uncertainty.

Our paper brings about clear avenues for extension and further research. Our model builds on expected utility theory, but the psychological and economic literature discuss alternative theories how decision makers deal with uncertainty. Some of these might turn-out to be fruitful to further understand how voters deal with the uncertainty that originates from coalition government options. As an example, prospect theory would allow for higher weights of coalitions with actually small probabilities. This might be quite sensible when voters consider and weigh unlikely coalitions, for instance a coalition between the right-wing populist AfD and CDU/CSU in our experiment, more strongly than the measured perceived probability would suggest.

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Appendix

Table of Contents

A. Observational Study

A.1. Sweden 2018 & New Zealand 2020

	Dependent variable: Propensity to vote for		
	Moderates *(Sweden 2018)*	SAP *(Sweden 2018)*	Labour *(NZ 2020)*
Government Lottery Variance	-0.085***	-0.171***	-0.165**
	(0.026)	(0.042)	(0.065)
Government Lottery Mean	0.163***	0.157***	0.428***
	(0.023)	(0.023)	(0.062)
Observations	1,736	1,734	426
R^2	0.696	0.691	0.715
Adjusted R^2	0.695	0.690	0.710

Table 1: Linear regressions of propensities to vote on perceived government lottery variance and mean.

Note: Linear regressions of propensities to vote on perceived government lottery variance and mean.We control for the party evaluation as well as gender, age, and education. *p<0.1; **p<0.05; ***p<0.01.

A.2. Germany 2017

	Dependent variable:			
	Union	SPD	FDP	Greens
	(1)	(2)	(3)	(4)
Government Lottery Variance	-0.012***	0.006	0.003	-0.001
	(0.003)	(0.005)	(0.004)	(0.003)
Government Lottery Mean	0.017***	-0.008*	0.010**	0.0001
	(0.006)	(0.005)	(0.004)	(0.004)
Observations	893	905	903	902
R^2	0.339	0.194	0.233	0.182
Adjusted R^2	0.330	0.183	0.221	0.170
Note:		*p<0.1; **p<0.05; ***p<0.01		

Table 2: Linear regressions of vote choice on perceived government lottery variance and mean (GLES Longterm Online Tracking 2017, Wave 37, N=1,085).

Note: We control for the party evaluation as well as gender, age, and education. *p<0.1; **p<0.05; ***p<0.01.

A.3. Germany 2013

	Dependent variable:			
	Union	SPD	FDP	Greens
	(1)	(2)	(3)	(4)
Government Lottery Variance	-0.009**	0.002	-0.0004	0.004
	(0.004)	(0.003)	(0.003)	(0.002)
Government Lottery Mean	0.025***	0.019***	0.006**	0.006
	(0.006)	(0.005)	(0.003)	(0.005)
Observations	775	812	798	783
R^2	0.380	0.259	0.121	0.202
Adjusted R^2	0.369	0.247	0.106	0.189
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 3: Linear regressions of vote choice on perceived government lottery variance and mean (GLES Longterm Online Tracking 2013, Wave 21, N=1,012).

Note: We control for the party evaluation as well as gender, age, and education. *p<0.1; **p<0.05; ***p<0.01.

	Dependent variable:			
	Union	SPD	FDP	Greens
	(1)	(2)	(3)	(4)
Government Lottery Variance	-0.004	-0.001	-0.004	-0.004
	(0.004)	(0.003)	(0.003)	(0.003)
Government Lottery Mean	0.019***	0.016***	0.008***	0.011***
	(0.004)	(0.005)	(0.002)	(0.004)
Observations	1,205	1,209	1,223	1,207
R^2	0.496	0.300	0.109	0.221
Adjusted R^2	0.492	0.294	0.101	0.213
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 4: Linear regressions of vote choice on perceived government lottery variance and mean (GLES Cross-Section 2013, Pre-election, N=2,003).

Note: We control for the party evaluation as well as gender, age, and education. *p<0.1; **p<0.05; ***p<0.01.

A.4. Germany 2009

	Dependent variable:			
	Union	SPD	FDP	Greens
	(1)	(2)	(3)	(4)
Government Lottery Variance	0.005*	-0.004	-0.004	-0.007***
	(0.003)	(0.003)	(0.003)	(0.002)
Government Lottery Mean	0.008	0.012**	0.002	0.002
	(0.006)	(0.006)	(0.005)	(0.005)
Observations	1,294	1,306	1,311	1,293
R^2	0.437	0.296	0.170	0.233
Adjusted R^2	0.433	0.290	0.163	0.227
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 5: Linear regressions of vote choice on perceived government lottery variance and mean (GLES Cross-Section 2009, Pre-election, N=2,173).

Note: We control for the party evaluation as well as gender, age, and education. *p<0.1; **p<0.05; ***p<0.01.

B. Experimental Study

B.1. Quotas

var	n	prop
Gender		
Männlich	524	0.43
Weiblich	664	0.55
Divers	6	0.00
Region		
Baden-Württemberg	133	0.11
Bayern	159	0.13
Berlin	59	0.05
Brandenburg	44	0.04
Bremen	16	0.01
Hamburg	36	0.03
Hessen	97	0.08
Mecklenburg-Vorpommern	13	0.01
Niedersachsen	122	0.10
Nordrhein-Westfalen	258	0.21
Rheinland-Pfalz	58	0.05
Saarland	22	0.02
Sachsen	68	0.06
Sachsen-Anhalt	31	0.03
Schleswig-Holstein	46	0.04
Thüringen	24	0.02
Age		
Age 18 - 29	200	0.17
Age 30 - 39	204	0.17
Age 40 - 49	183	0.15
Age 50 - 59	228	0.19
Age 60 - 75	370	0.31
Age above 75	5	0.00

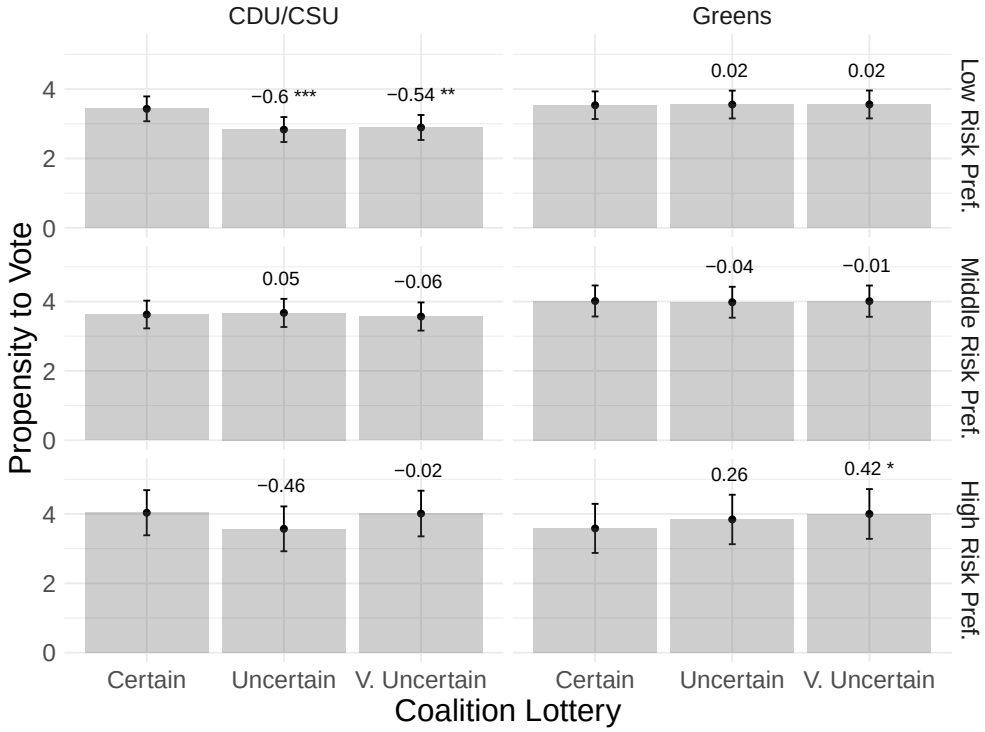

Figure 6: Propensity to vote for the CDU/CSU and the Green Party for the different scenarios and conditional on risk preferences of candidate.

B.2. Additional Results

B.3. Regression Tables

	CDU/CSU			Greens		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Uncertain Coal. Lottery	-0.32^{**}	-0.30^{*}	-0.31^{**}	0.03	0.01	0.04
	(0.10)	(0.13)	(0.10)	(0.08)	(0.10)	(0.08)
Very Uncertain Coal. Lottery	-0.26^{*}	-0.25	-0.26^{*}	0.06	0.09	0.07
	(0.12)	(0.14)	(0.12)	(0.09)	(0.11)	(0.09)
Respondent Fixed Effects		X			X	
Scenario Fixed Effects			X			X

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 6: Results from experimental study. Unconditional effect estimates from linear regression models, with clustered standard errors.

	CDU/CSU	Greens
	Model 1	Model 1
Uncertain Coal. Lottery	-0.60^{***}	0.02
	(0.16)	(0.11)
Very Uncertain Coal. Lottery	-0.54^{**}	0.02
	(0.18)	(0.14)
Middle Risk Preferences	0.19	0.48
	(0.27)	(0.31)
High Risk Preferences	0.61	0.05
	(0.40)	(0.42)
Uncertain X Middle Risk Pref.	0.64^{**}	-0.06
	(0.22)	(0.18)
V. Uncertain X Middle Risk Pref.	0.48	-0.03
	(0.25)	(0.21)
Uncertain X High Risk Pref.	0.13	0.24
	(0.33)	(0.26)
V. Uncertain X High Risk Pref.	0.51	0.39
	(0.39)	(0.29)

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 7: Results from experimental study. Conditional effect estimates risk preferences from linear regression models, with clustered standard errors.

	CDU/CSU	Greens
	Model 1	Model 1
Uncertain Coal. Lottery	0.26	0.12
	(0.20)	(0.17)
Very Uncertain Coal. Lottery	0.34	−0.13
	(0.21)	(0.22)
Middle PTV Party	2.62***	4.01***
	(0.49)	(0.46)
High PTV Party	4.53***	5.89***
	(0.55)	(0.47)
Uncertain X High PTV Party	−0.45	−0.09
	(0.45)	(0.33)
V. Uncertain X High PTV Party	−0.27	−0.03
	(0.55)	(0.45)

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 8: Results from experimental study. Conditional effect estimates propensity to vote (PTV) from linear regression models, with clustered standard errors.