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The Impact of Happiness on Voting for Incumbents in Europe:

An Instrumental Variable Analysis

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1 Introduction

What factors influence voters' support for an incumbent cabinet? For decades, extensive research on retrospective voting has established a link between economic factors—such as GDP growth and changes in household income—and the likelihood of a government being re-elected (Healy and Malhotra 2013; Fair 1978). The prevailing conclusion is that voters tend to reward incumbents during periods of prosperity and punish them during economic downturns (Duch 2008; Lewis-Beck and Stegmaier 2000). However, this economic-focused approach has been criticized for overlooking potential non-economic factors that might influence voters' decisions. This has led to increased interest in evaluating national performance measures that go 'beyond GDP' (Fleurbaey 2009). One such characteristic that has gained attention is subjective well-being, often referred to as 'happiness' or 'life satisfaction' (Filiztekin and Kent 2023; Liberini, Redoano and Proto 2017). Recent findings by Ward (2020) suggest that subjective well-being exerts a stronger influence on support for incumbents than traditional macroeconomic indicators. This challenges the conventional focus on economic factors and underscores the need to examine the broader spectrum of non-economic determinants, particularly life satisfaction.

Despite the compelling evidence from Ward's research (2020), the original analysis does not account for the unstable nature of subjective well-being, which may be confounded by exogenous factors, potentially leading to bias. To address this issue, this paper proposes an instrumental variable approach (IV) using average and quadratic temperatures as instruments to isolate the causal effect of life satisfaction on incumbent support. Weather is particularly suitable for this purpose because it is beyond the control of individuals or governments and has well-documented effects on mood and life satisfaction. Accordingly, my analysis aims to enhance understanding of the interplay between non-material measures of voters' well-being and voting behavior. This is crucial for designing effective electoral campaigns and provides new insights into the dynamics of retrospective voting.

The central research question of this study is: How does happiness affect voters' support for governmental parties? I maintain the original hypothesis that higher levels of life satisfaction

are associated with a greater incentive to vote for incumbents. While the empirical results from the linear model support this expectation, aligning with Ward's findings, the estimates obtained from IV models call into question the causal effect of life satisfaction on electoral preferences, thus highlighting the need for further exploration of exogenous factors that may influence this relationship.

In the following section, I review the existing literature on retrospective voting, describe the current state of research, and develop a theoretical argument regarding the effects of life satisfaction on incumbents' support. Further, I discuss the data, the choice and operationalization of explanatory variables, and the methods used for analysis. In the empirical section, I present statistical findings and summarize the main results and their potential implications in the conclusion.

2 Theoretical framework

The central question posed by the theory of retrospective voting is: regardless of responsibility, does the administration prosper in good times and suffer in bad times electorally? This approach views elections as a frequent interaction between voters and parties, placing democratic regimes within a principal-agent framework where voters act as the controlling principals (Strøm 2000; Kiewiet and Rivers 1984). Despite their electoral power to hold parties accountable, voters face the classic principal-agent problem of information asymmetry (Borowiak 2011; Akerlof 1970). Voter interests often differ from those of political parties; while citizens seek the implementation of effective policies, incumbents are incentivized to maintain the power, thus distorting information on policy outcomes (Key 1966). Consequently, voters often lack accessible and reliable information regarding the performance of these agents, which potentially undermines trust in political statements (Duggan 2000). Accordingly, the theory of retrospective voting posits that rational voters assess changes in their living conditions as the main indicators of political performance and choose candidates whom they perceive as competent and effective, based on their personal utility (Fiorina 1978).

For an extended period, the literature primarily focused on material well-being as a proxy for people's "decision utility," which influences voter turnout. Building on the theoretical framework of Kramer (1971) and subsequent studies, the standard model suggests that voters are motivated by economic concerns and make retrospective, incumbency-oriented decisions based on the results of economic policies (Kiewiet and Rivers 1984). Indicators such as changes in real per capita income (Alford and Hibbing 1981; Bloom and Price 1975), unemployment (Burden and Wichowsky 2014), inflation (Meltzer and Vellrath 1975), and real GNP per capita (Fair 1978) have been shown to influence support for incumbents, with improvements in economic well-being associated with greater government support.

This approach has faced criticism for excluding non-economic indicators that may influence public support for governments. For instance, Nannestad and Paldam (1995) highlighted the importance of institutional structures in boosting support, based on the example of Denmark's strong social state. Other scholars have extended this framework by emphasizing the significance of voters' perceptions regarding incumbents' competence (Duch 2008) and satisfaction with public services (Filiztekin and Kent 2023). Additionally, psychological studies have introduced other factors, including group and status threats (Knowles and Tropp 2018), preferences for authoritarianism (MacWilliams 2016), and moral values (Enke 2020).

As a result, inside of the retrospective voting approach, there has been growing interest in developing a more comprehensive measure of well-being that extends beyond standard economic indicators and better predicts electoral outcomes (Stiglitz 2009). Recent studies have explored subjective well-being - often referred to as "life satisfaction" or "happiness" - as a potential factor influencing voting intentions. Studying a long-run panel of general elections in Europe, Ward (2020) argues that happiness is a stronger driver of cabinet support, both at individual and national levels, than macroeconomic factors, which are commonly used in economic voting literature. Other research, focused on single cases, supported these findings, attributing them to the modern expansion of policy instruments available to the state, allowing voters to effectively link their life conditions and overall

satisfaction to the quality of governance (Ward et al. 2021; Liberini, Redoano and Proto 2017). Following the logic of the original economic retrospective voting theory, these papers emphasize the rewarding or punishing of political performance based on the electorate's overall life satisfaction.

While studies on subjective well-being within single countries have attempted to control for potential exogenous shocks that might affect life satisfaction estimates—such as considering lagged life satisfaction (Ward et al. 2021) or situations like widowhood (Liberini, Redoano and Proto 2017)—Ward's analysis of 15 European countries does not account for potential biases. To address this gap, my research introduces an instrumental variable approach to isolate the causal relationship between life satisfaction and electoral support from a broad European perspective. Building on Ward's findings, I continue testing the main hypothesis of the original research:

H1: A higher level of life satisfaction is associated with increased support for incumbents.

3 Data and Measurement

3.1 Data on Voting Intentions and Life Satisfaction

For this analysis, I use data provided by Ward (2020) to replicate his main findings and expand upon them using an instrumental variable approach. The original research relies on individual-level Eurobarometer data collected from 1973 to 2000, during which respondents were asked about their subjective well-being and potential voting intentions in general elections. The Eurobarometer surveys used for this analysis consist of independently drawn random samples of individuals from the same countries at different points in time and across various seasons. The sample includes over 400,000 respondents from 447 national surveys across the following European countries: Austria, Belgium, Germany, Denmark, Spain, Finland, France, the United Kingdom, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Sweden.

Table 1: Descriptive statistics

Statistic	N	Mean	St. Dev.	Min	Max
Life Satisfaction	292,464	3.09	0.75	1	4
Voting for Government Party	292,464	0.44	0.50	0	1
Average Temperature	280,307	9.49	3.75	−10	19
Political Characteristics					
Government's Seat Share	292,464	0.55	0.10	0.30	0.99
Government Ideological Disparity	292,464	0.81	0.76	0.00	2.81
Number of Parties in the Government	292,464	2.25	1.34	1	6
Party Fractionalization	292,464	4.42	1.56	2.42	9.81
Demographic Characteristics					
Age	291,523	44.64	17.20	18	99
Female	292,464	0.50	0.50	0	1
Education	291,227	1.91	0.90	1	4
Marital Status	292,028	1.95	0.81	0	4

I analyze the period from 1973 to 2000 using a binary dependent variable that measures voting intention towards the governing party, *Incentive to Vote for Government Party*. This variable was pre-processed by Ward (2020), who matched responses regarding electoral preferences with information about government parties from the ParlGov database during the survey months. Accordingly, the dependent variable is coded as 1 if the respondent intends to vote for a government party and 0 otherwise.

Additionally, I follow the approach outlined in the original article by restricting the sample to 'likely voters.' This restriction is important because the decision to support the incumbent parties involves both the general decision to vote and the specific choice of candidate (Ward 2020). Consequently, the final sample consists of respondents who expressed a positive voting intention for a particular party, even if that party is not currently in government. This results in a total of 292,464 observations, as presented in Table 1.

The independent variable, *Life Satisfaction*, is measured using the subjective well-being scale provided in the survey, which ranges from 1 to 4. Each level corresponds to a specific degree of happiness: 1 means 'Not at all satisfied,' 2 corresponds to 'Not very satisfied,' 3 is labeled 'Fairly satisfied,' and 4 stands for 'Very satisfied.'

3.2 Data on Average Temperature

I use the National Centers for Environmental Information (NCEI) database, which contains average temperature estimates dating back to 1973, as a source of exogenous weather variation. This dataset is built on daily data collected from a network of weather stations across various countries, which I aggregate to the monthly level for my analysis. A key advantage of using this global weather source is its extensive historical coverage, which allows me to address missing data in certain countries, such as Finland and Sweden. Additionally, it allows for the incorporation of past temperature estimates, which is not always possible with other sources, such as the U.N. Food and Agricultural Organization Climatic (FAOCLIM).

Descriptive statistics, presented in Table 1, indicate that there is a considerable variation in average temperatures across years and countries, with Finland in 1995 recording the lowest indicators and Portugal in 1986 the highest ones. This broad range of weather conditions provides a systematic exogenous variation across countries and years.

3.3 Data on Control Variables

Following the approach offered by Ward (2020), I include time-varying political characteristics for each country year in my analysis. These variables control for (1) the number of parties in the government, (2) the government's collective seat share, (3) government ideological disparity, and (4) party fractionalization. All political controls are drawn from the ParlGov database. Descriptive statistics for the estimates are presented in Table 1.

The sample captures a variety of democratic regimes, with some countries displaying similar ideological viewpoints—such as Sweden in 1995, where the ideological disparity is equal to 0—and others, like Greece in 1989, displaying significant ideological distance, with a disparity of 2.81. Additionally, Belgium in 1997 represented the highest level of party fractionalization, while the year 2000 saw the largest number of parties in government, totaling 6. In contrast, Great Britain in 1973 had the lowest values for both indicators, with only one party in government and a fractionalization score of 2.42. Furthermore, Denmark in 1975 presented as an example of a minority government, holding a seat share of just 30%, while Greece in 1989 illustrated a majority government, with 99% of governmental control. Consequently, controlling for these variables aims to clarify potential causal pathways regarding the effects of varying institutional characteristics on voting incentives.

Since my analysis focuses on the individual level, I include the demographic characteristics of the respondents as additional controls. These characteristics consist of a binary variable for gender, where females are represented by 1. I also take into account the respondents' age and the age at which they left education, which ranges from 0 (indicating missing values) to 4 (representing 'still studying'). The intermediate categories are defined such that 0-15 years old corresponds to 1, 16-19 years old to 2, and 20 years old and above to 3. A similar structure

is applied to marital status, where single, married, divorced/separated, widowed, and missing cases are captured by values of 1, 2, 3, 4, and 0, respectively. For improved accuracy in model estimation, these two categories are later transformed into dummy variables, which take on a value of 1 when the corresponding education or marital status is achieved. All demographic variables are derived from Eurobarometer surveys.

As illustrated in Table 1, the sample includes a wide range of age groups, from 18 to 99 years old. While education data may be missing (indicated by a value of 0), the minimum age at which respondents left education, as reflected in the sample, is categorized as 0-15 years. Nevertheless, there are instances where marital status is missing. Accordingly, the diverse demographic characteristics of the respondents, presented in the dataset, create a variety of voter profiles, which are accounted for in subsequent models.

4 Estimation Framework

The original approach of purely regressing life satisfaction on the incentive to vote for an incumbent, offered by Ward (Ward 2020), assumes that the estimation of subjective well-being is an endogenous process. This assumption introduces the risk of omitting unobservable factors that are partially correlated with respondents' assessments of their subjective well-being, which can potentially bias the relationship between the dependent and independent variables. To draw causal inferences about the relationship between electoral intentions and happiness, I employ an instrumental variable two-stage least squares (IV-2SLS) approach to model life satisfaction using estimates of exogenous factors. This method approximates a random treatment and enables isolation of the causal effect of subjective well-being on support for incumbents while correcting for the influence of unobserved predictors of satisfaction.

The instrumental variable regression framework is particularly useful for addressing situations where the independent variable may be endogenous. The process begins with identifying a strong instruments — these are variables that (1) are independent of potential outcomes, (2) are uncorrelated with unobservable factors that influence the dependent

variable, (3) are correlated with the endogenous independent variable, and (4) fulfill monotonicity assumption (Baiocchi, Cheng and Small 2014). The endogenous variable is first regressed on the instrument, and the predicted values from this regression are then used as independent variables in the original model of interest. As long as the instrument meets these criteria, IV regression is believed to provide consistent and unbiased estimates of the causal effect of the endogenous variable on the outcome variable (Angrist, Imbens and Rubin 1996).

In line with established literature, I use weather—specifically, air temperature—as an instrument for subjective well-being estimation. First, it satisfies the criteria for independence of outcomes. Air temperature is unaffected by either voters or politicians, thereby minimizing the potential for manipulation from both sides. Additionally, the design of the Eurobarometer surveys ensures that respondents are interviewed in different seasons, which supports the randomization of weather conditions. Although the temperature is not strictly randomized due to geographic characteristics, it can still serve as a robust instrument as its distribution is determined independently of political or social factors and is consistent over the surveys (Keele 2015). To account for this variation, I include survey-fixed effects in the model.

The second characteristic of a valid instrument is the exclusion restriction, which posits that the instrument influences the outcome variable only through the endogenous independent variable and not through any alternative channels. To theoretically justify this condition, I draw on the concept of retrospective voting, which frames political preferences as a result of principal-agent relationships. In this context, voters act as rational principals, assessing incumbents based on changes in their utility as influenced by living conditions. Since economic status and personal well-being are directly linked to government policies, they form the basis for electoral decisions. However, air temperature is exogenous to political performance and is unlikely to be a direct cause for rewarding or punishing incumbents. Consequently, based on this theory, I assume that voters' motivations to support or oppose the government electorally should primarily arise from changes in

material and non-material conditions, rather than from fluctuations in weather.

One potential concern is that weather conditions could impact electoral processes, as cold or heat might deter individuals from going to polling stations (Hansford and Gomez 2010). However, this issue does not pose a threat to the exclusion restriction in my analysis for two reasons. First, I limit the sample to "likely voters," focusing on individuals who are already inclined to participate in elections. Second, survey respondents express their voting intentions in a hypothetical scenario ("if elections were held tomorrow"), meaning that their responses do not require any physical action and are, therefore, not affected by actual weather conditions at the time of the survey.

Another general concern regarding the exclusion restriction is the possibility that different states experience systematically varying weather patterns, which may also correlate with distinct political preferences (Aistrup 2010). For instance, if certain areas have consistently sunnier weather and tend to favor specific political attitudes, this could violate the exclusion restriction. To mitigate this issue, I include country-fixed effects in my analysis, ensuring that comparisons are made within countries rather than across them. This approach allows the identifying variation to stem from temperature fluctuations within the same country, rather than from differences in climate and political tendencies between countries. By controlling for these fixed effects, I reduce the risk that regional variations in temperature and political behavior influence the results. Nonetheless, I acknowledge that I am unable to definitively rule out the possibility that air temperature could have some independent impact on the voting intentions beyond its impact on working through life satisfaction, though I believe that these other effects are likely to be minor.

The third and fourth requirements for a strong instrument are that (a) it must be correlated with the endogenous independent variable and (b) it should have a consistent direction of the effect for all individuals. Theoretically, there is evidence that air temperature affects people's mood and their assessment of life satisfaction. Studies focusing on the impact of ambient temperature on emotional well-being have highlighted that a temperature rise has a positive impact on the likelihood of fatigue and reduces positive

emotions and overall happiness among people (Noelke et al. 2016; Zapata 2022). Additionally, some studies indicate that extreme weather conditions can further depress people's moods (Chen, Zhang and Chen 2024). To capture these effects, I introduce two instruments: Monthly Average Air Temperature and Quadratic Air Temperature. The first measure aims to estimate the direct effects of weather conditions on life satisfaction, while the second addresses the assumption that extreme changes may also impact subjective well-being.

To quantitatively assess whether the instruments have sufficient explanatory power, the first stage of IV-2SLS estimation is crucial, as it examines the relationships between the instrumental and endogenous variables. In this context, temperature ($AirTemperature_{i,b}$) is used as an instrument for subjective well-being ($LifeSatisfaction_{i,b}$) in the first stage of the estimation. To account for the potential effects of weather conditions, I run two models: one using average air temperature and the other using quadratic air temperature. Following this logic, the first-stage regression can be specified as follows:

$$\text{Life Satisfaction}_{i,b} = \alpha + \beta_1 \cdot \text{AirTemperature}_{i,b} + \gamma \cdot \text{Z}_{i,b} + \delta \cdot \text{X}_{i,b} + \lambda_i + \mu_b + \epsilon_{i,b}$$

... where $Z_{i,b}$ is a vector of time-varying political controls, while $X_{i,b}$ captures demographic variables such as respondents' age, level of education, marital status, and gender. As discussed above, country fixed effects λ_i and survey fixed effects μ_b are included to account for within-country deviations and survey-variant characteristics, respectively. The term $\epsilon_{i,b}$ represents an error term, while α is an intercept.

Table 2: First-Stage Regression: Air Temperature and Life Satisfaction

	Dependent variable:	
	Life Satisfaction	
	(1)	(2)
Average Air Temperature	-0.011^{***}	
	(0.003)	
Quadratic Air Temperature		-0.0003^{**}
		(0.0001)
Country Dummies	✓	✓
Survey Dummies	✓	✓
Demographics	✓	✓
National Politics	✓	✓
Observations	279,479	279,479
R^2	0.152	0.152
Adjusted R^2	0.152	0.152
Residual Std. Error	0.692	0.692
F Statistic	726.478^{***}	725.380^{***}

Note: Coefficients with clustered standard errors at the country level in parentheses.
*p<0.1; **p<0.05; ***p<0.01

The first-stage relationship between average temperature and life satisfaction is illustrated in Table 2. In both models, the effects of weather conditions on subjective well-being are negative and statistically significant: the linear term is significant at the 1% level, while the quadratic term is significant at the 5% level. These results remain robust after accounting for control variables and satisfy the monotonicity assumption, indicating a consistent direction in the effect of air temperature on life satisfaction. As theorized, an increase in air temperature is linked to an overall decrease in subjective well-being for my sample.

To further assess whether the instrument possesses sufficient explanatory power, the econometric literature suggests that the F-test statistic of at least 10 should be obtained

(Staiger and Stock 1994). As indicated in Table 2, the F-test statistic exceeds this threshold in both specifications, thereby further validating my choice of air temperature as an instrument for assessing voters' life satisfaction.

After regressing the endogenous independent variable on the instrument and confirming that air temperature is a strong instrument, I use the predicted values from this model as an independent variable in the main analysis. Consequently, the second-stage equation estimates the impact of life satisfaction on the incentive to vote for the governing party is:

$$\text{Incentive to Vote for Government Party}_{i,b} = \alpha + \beta_1 \cdot \widehat{\text{Life Satisfaction}}_{i,b} + \gamma \cdot \text{Z}_{i,b} + \delta \cdot \text{X}_{i,b} + \lambda_i + \mu_b + \epsilon_{i,b}$$

... where the covariates are similar to those used in the first stage of IV-2SLS estimation with $Z_{i,b}$ and $X_{i,b}$ presenting political and demographic controls, and λ_i and μ_b addressing country- and survey- fixed effects, respectively.

Although the dependent variable is binary, I follow the approach proposed by Ward (2020) and use a linear probability model (LPM). This choice is based on the finding that the marginal effects estimated from logit models closely resemble those obtained from LPM analysis. Additionally, I cluster standard errors at the country level.

5 Empirical Results

The results of the LPM and second-stage IV fixed-effects models are presented in Table 3. The first column shows the LPM estimates for the model, which includes actual, not instrumented, subjective well-being estimations as a key independent variable. The coefficient for life satisfaction is positive and statistically significant at the 1% level, indicating that, on average, a one-unit increase in the level of happiness is associated with a 5% increase in the probability of preferring to vote for the governing party, while holding everything else constant. Therefore, based on the LPM results, it is possible to find support for the Hypothesis 1 that states that higher levels of life satisfaction are associated with greater support for incumbents.

The results for the IV-2SLS fixed-effects model, which uses average temperature as an instrument, are presented in column 2 of Table 3. In this specification, the estimated effect of life satisfaction on the intention to vote for the government party remains positive, consistent with the findings from the linear probability model. However, while the IV coefficient is larger in magnitude compared to the LPM estimate, it is not statistically significant. This raises doubts about the robustness of the relationship observed in the original model.

Furthermore, the third specification, which employs quadratic air temperature as an instrument, introduces additional concerns regarding the causal interpretation of the effect of subjective well-being on electoral preferences. In this model, the estimated coefficient is negative and not statistically significant, suggesting that higher life satisfaction may be associated with a lower intention to vote for the government party. However, the lack of statistical significance prevents me from drawing firm conclusions.

Overall, the findings from the IV approach call into question the causal effect of life satisfaction on electoral preferences, as claimed in the original article by Ward (2020). The absence of statistical significance in both specifications, as well as the negative estimate in the third model, indicate potential endogeneity concerns in the LPM model, which may be

Table 3: Regression Results for the LPM and IV Models

	Dependent variable:		
	Incentive to Vote for Government Party		
	LPM	IV: Average Temperature	IV: Quadratic Temperature
	(1)	(2)	(3)
Life Satisfaction	0.054^{***}	0.282	-0.224
	(0.006)	(0.355)	(0.509)
Constant	-0.045^{***}	-0.752^{***}	0.848^{**}
	(0.017)	(0.236)	(0.415)
Country Dummies	✓	✓	✓
Survey Dummies	✓	✓	✓
Demographics	✓	✓	✓
National Politics	✓	✓	✓
Observations	291,523	279,479	279,479
R^2	0.053	-0.046	-0.098
Adjusted R^2	0.052	-0.046	-0.099
Residual Std. Error	0.484	0.508	0.521

Note: Coefficients with clustered standard errors at the country level in parentheses. *p<0.1; **p<0.05; ***p<0.01.

biased due to omitted exogenous factors. Alternatively, while the first-stage results of the IV-2SLS regression indicate a significant relationship between air temperature and life satisfaction, I cannot fully dismiss concerns regarding the strength and validity of the instrument used. Taken together, the results emphasize the need for further exploration of the interconnection between subjective well-being and electoral preferences by using various causal strategies.

6 Conclusion

This paper aims to address the endogeneity concerns regarding life satisfaction, which were raised following Ward's (2020) research on the effect of happiness on voting intentions towards government parties. By using average and quadratic air temperatures as instrumental variables for estimating subjective well-being, I question the original findings that suggest a strong connection between life satisfaction and pro-incumbent electoral preferences. While Ward (2020) highlighted the significant positive effect of the independent variable, my paper emphasizes the need for further exploration of exogenous factors that influence the relationship between subjective well-being and voting intentions.

These findings have important implications for both policymakers and researchers. If life satisfaction does not consistently translate into pro-incumbent voting, it underscores the necessity of exploring alternative mechanisms behind voting intentions as part of electoral strategies. Academically, this study highlights the need for a more in-depth examination of causal inference in retrospective voting. Future research should investigate alternative instruments for measuring subjective well-being and assess the long-term versus short-term effects on electoral decisions. Overall, these results challenge existing assumptions about the positive effect of subjective well-being on voting behavior and call for a more nuanced understanding of how subjective and objective factors interact to shape electoral outcomes.

Word count: 3903 (without References)

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